

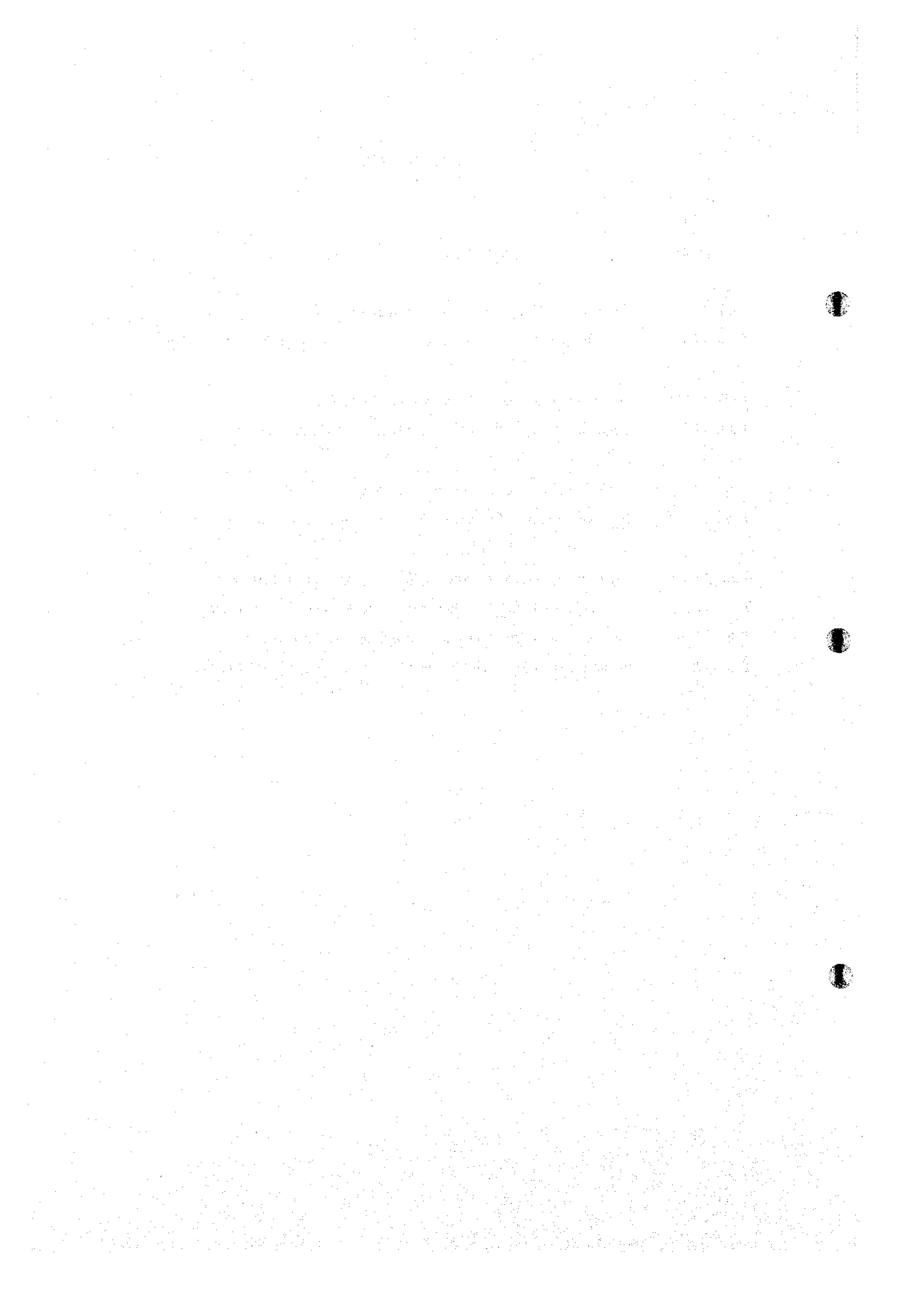
17. Economic Analysis

17. Economic Analysis

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17. Economic Analysis

17.1 Methodology of Economic Analysis and Conditions

17.1.1 Methodology

Economic analysis is to be carried out by using "with and without" method. "With" means the project and "Without" means an alternative power plant equipped with an equivalent kW and kWh at Sending-out (Powerhouse Exit) with those of the project. This methodology is derived from the concept that if the project does not exit, an alternative method will be proceeded to achieve the objective. The cost of the relevant project is represented by the term of "C(ost)" and the cost of an alternative is represented by the term of "B(enefit)".

A combined cycle power plant is selected as an alternative power plant to be compared with the relevant project in respect to evaluating the economic performance of the projects based on the discussion with MIH.

The basic technique is to discount "Cost" and "Benefit" occurring in different periods and express them all in a common value at any one point of time.

The economic preference of the project is to be valued by using the Economic Internal Rate of Return (EIRR). EIRR is calculated by the following formula.

$$EIRR = r (\%)$$

Where

$$\sum_{t=0}^n \frac{Ct}{(1+r)^t} = \sum_{t=0}^n \frac{Bt}{(1+r)^t}$$

Ct: Cost (Cost involved in the project)

Bt: Benefit (Cost invoved in the alternative)

t : year

n: life time of the project

r: discount rate (%)

The EIRR calculated by the above formula is to compare with the ARI (Accounting Rate of Interest) of which rate is set 10% by IBRD in power sector for developing countries. If the EIRR exceeds the ARI, the project is said to be economically feasible, otherwise the project is not feasible.

Costs consist of following components;

- Project Cost (Construction Cost + Owner's Administration + Engineering Fee + Physical Contingency)
- Operation & Maintenance Cost (O/M cost)
- Fuel Cost.

Subsidies, and duty and tax are excluded in the Economic Analysis since the Economic Analysis is carried out from the view point of a country's economy. Price escalation (Price contingency) is also excluded because it is considered that the price escalation will affect "Cost" and "Benefit" simultaneously.

The price escalation for the fuel cost, however, is taken into consideration in the case of using different resources.

The prices applied to the Economic Analysis are used the shadow prices or the accounting prices basically. The project costs described in Chapter 16 are regarded as the shadow prices because of being estimated on a foreign exchange basis and are used in this Chapter without any treatment.

17.1.2 Common Conditions

Common conditions applied to the Economic Analysis are shown in Table 17.1-1. Economic and technical data are referred to EGAT (Energy Generation Authority of Thailand) internal data. If EGAT data are not available, PLN (Indonesian State-owned Power Electricity Company) internal data are referred.

The cost of transmission line involved in the project is taken into account in the economic analysis on the concept that the hydropower projects are located at the remote area while the combined cycles are adjoined to consumer's place usually.

Economic performance of alternative plans of transmission line up to the Thai border are also verified in sensitivity test for the Case 1 (allocated transmission line system) and the Case 2 (independent transmission line) because the transmission line in the basic condition is assumed to be constructed up to Ban Houaykong Substation (details are explained in Chapter 12).

Since the each commencement year of the commercial operation for the three (3) project sites (four plans) has not been established at present, the year zero (0) is defined as the

commercial operation commencement and the year minus ten (-10) is defined as the initial year for the project provisionally in the economic analysis.

Table 17.1-1 Common Conditions for Economic Analysis

Items	The Project	The Alternative	Remarks
Power Source	Hydro Power	Combined Cycle	according to the discussion with MIH.
Construction Cost	up to the projects	744.17 US\$/kW *	* as of 1994 Price Level
Construction Period	up to the projects	3 years * 25, 32.5, 42.5 %	* F/C : L/C = 75 : 25
Planned Maintenance Days	6 days/year	63 days/year	
Forced Outage Rate	1.0 %	9.0 %	
Plant Available Factor	97.4 %	75.3 %	$PA=(1-PO/365)(1-FO)$
Station Use	1.0 %	5.0 %	
T/D Loss	10 %	10 %	
O/M Cost	1.5 %	2.5 %	of the Const. Cost
Fuel Cost	0.0 \$/MWh	18.43 \$/MWh	LNG , 1 US\$ =26 Baht
Fuel Escalation	-	2.0 % per annum	assumed 3% increase in real term for crude oil
Life Time	50 years *	25 years	* according to the discussion with MIH

Table 17.1.1-2 Plant Properties and Equivalent Capacity of Combined-cycle Power Plant

Planned Mainten. Days (days/yr)	Forced Outage Rate (Frac.)	Plant Available Factor (%)	Station Use (%)	T/D Loss (%)	Firm Capacity (8 Hrs) (MW)	Annual Generation Energy (MWh)	Available Output at Sending-out (MW)	Sending-out Energy (MWh)	Energy Generation Equivalent (MWh)	Equivalent Output (MW)
a	b	c	d	e	f	g	h	i	k	L
(days/yr)	(Frac.)	(%)	(%)	(%)	(MW)	(MWh)	(MW)	(MWh)	(MWh)	(MW)
		(1-a/365)					$f \times c \times (1-d)$	$g \times (1-d)$	$i / (1-d)$	$h / \{c \times (1-d)\}$
Sekong No.4	6	0.01	97.373	1.0	406	1,815,000	391.4	1,797,840	-	-
CC-500 Class	63	0.09	75.293	5.0	-	-	-	1,797,840	1,892,463	547.2
Xe Kaman No.1	6	0.01	97.373	1.0	245	1,137,000	236.2	1,125,630	-	-
CC-300	63	0.09	75.293	5.0	-	-	-	1,125,630	1,184,874	330.2
Xe Namnoy (Mid. + Down)	6	0.01	97.373	1.0	296	1,384,000	285.3	1,370,160	-	-
CC-400	63	0.09	75.293	5.0	-	-	-	1,370,160	1,442,274	398.9
Xe Namnoy (Mid.)	6	0.01	97.373	1.0	230	1,052,000	221.7	1,041,480	-	-
CC-300	63	0.09	75.293	5.0	-	-	-	1,041,480	1,096,295	309.9

Note: CC is the abbreviation for Combined Cycle Power Plant.

Fuel Cost Calculation

Type of Plant	Fuel Type	Fuel Price Bht/MMBTU	Exchange Rate * Bht/US\$	Fuel Price \$/MMBTU	Heat Rate BTU/kWh	Fuel Cost \$/kWh
Combined C.	LNG	63,090	26.00	2,4265	7,595	0.01843

* Exchange Rate as of 1993, EGAT Basic Criteria for Economic Analysis

17.2 Se Kong No.4 Project

17.2.1 Basic Conditions in Comparison with the Alternative

The project consists of the following characteristics.

- Installed Capacity	443	MW
- Firm Capacity	406	MW
- Sending-out Energy	1,797.8	GWh
- Project Cost	643.61	M.US\$

More detailed conditions in comparison with the alternative are shown in Table 17.2-1.

17.2.2 Result of Economic Analysis and Sensitivity Test

The EIRR for the basic conditions resulted in 10.81% as demonstrated in Table 17.2-2. Since the EIRR exceeds ARI (10%), the project is deemed to be economically feasible. The EIRR for the Sekong No.4, however, gives the lowest value among the three project sites (four plans).

Sensitivity test is carried out with respect to construction cost and annual generation energy from the view point of the risk management. The results of sensitivity test are shown in below. According to the below results, there is almost no allowance for the Sekong No.4 Project in respect to construction cost and generation energy respectively.

a) Construction Cost

Case	Construction Cost	EIRR (%)
Base Case	1,585 \$/kW	10.81
10 % up	1,744 \$/kW	9.76

b) Generation Energy

Case	Annual Generation Energy	EIRR (%)
Base Case	1,816.0 Gwh	10.81
20 % less	1,452.8 GWh	9.70

c) **Transmission Line up to the Thai Border**

Case	Construction Cost	EIRR (%)
Base Case	1,585 \$/kW (643.6 M.US\$)	10.81
Case 1 (Allocated)	1,704 \$/kW (691.6 M.US\$)	10.01
Case 2 (Independent)	1,700 \$/kW (690.3 M.US\$)	10.03

Table 17.2-1 Basic Conditions for Se Kong No.4 and the Alternative

Items	Se Kong No.4	Combined Cycle	Remarks
Installed Capacity	(443 MW)	547.2 MW	
Firm Capacity	406 MW *1	547.2 MW *2	*1 Peak 8 Hours *2 Equivalent capacity for the firm of the project.
Available Output at Sending-out	391.4 MW	391.4 MW	Firm Capacity x P.Available Factor x (1 - Station Use)
Generation Energy	1,816 GWh	1,892.4 GWh	Annual Average Energy
Sending-out Energy	1,797.8 GWh	1,797.8 GWh	Generation Energy x (1 - Station Use)
Construction Cost for Firm Capacity	643.61 M.US\$ * 1,585.25 \$/kW	407.2 M.US\$ 744.17 \$/kW	*Transmission Line up to Ban Houaykong is inclusive.
Construction Period	9 years * 8.0, 4.0, 10.0, 14.0, 11.0, 16.0, 17.0, 13.0, 7.0%	3 years 25, 32.5, 42.5 %	* Including Preparatory Works

17.3 Xe Kaman No.1 Project

17.3.1 Basic Conditions in Comparison with the Alternative

The project consists of the following characteristics.

- Installed Capacity	256	MW
- Firm Capacity	245	MW
- Sending-out Energy	1,125.6	GWh
- Project Cost	404.05	M.US\$

More detailed conditions in comparison with the alternative are shown in **Table 17.3-1**.

17.3.2 Result of Economic Analysis and Sensitivity Test

The EIRR for the basic conditions resulted in 11.78% as demonstrated in **Table 17.3-2**.

The results of sensitivity test are shown in below. The EIRR and the sensitivity test show a little better results of that of the Sekong No.4 Project. The Xe Kaman No.1 Project is deemed to be economically feasible.

a) Construction Cost

Condition	Construction Cost	EIRR (%)
Base Case	1,649 \$/kW	11.78
20 % up	1,979 \$/kW	9.46

b) Generation Energy

Condition	Construction Cost	EIRR (%)
Base Case	1,137.0 GWh	11.78
25 % less	852.8 GWh	10.11

c) Transmission Line up to the Thai Border

Case	Construction Cost	EIRR (%)
Base Case	1,649 \$/kW (404.16 M.US\$)	11.78
Case 1 (Allocated)	1,780 \$/kW (436.2 M.US\$)	10.74
Case 2 (Independent)	1,805 \$/kW (442.1 M.US\$)	10.57

Table 17.3-1 Basic Conditions for Xe Kaman No.1 and the Alternative

Items	Xe Kaman No.1	Combined Cycle	Remarks
Installed Capacity	(256 MW)	330.2 MW	
Firm Capacity	245 MW *1	330.2 MW *2	*1 Peak 8 Hours *2 Equivalent capacity for the firm of the project.
Available Output at Sending-out	236.2 MW	236.2 MW	Firm Capacity x P.Available Factor x (1 - Station Use)
Generation Energy	1,137 GWh	1,184.9 GWh	Annual Average Energy
Sending-out Energy	1,125.6 GWh	1,125.6 GWh	Generation Energy x (1- Station Use)
Construction Cost for Firm Capacity	404.05 M.US\$ * 1,649.18 \$/kW	245.72 M.US\$ 744.17 \$/kW	*Transmission Line up to Ban Houaykong is inclusive.
Construction Period	7 years * 8.0, 5.0, 18.0, 22.0, 23.0, 17.0, 7.0 %	3 years 25, 32.5, 42.5 %	* Including Preparatory Works

17.4 Xe Namnoy Project

17.4.1 Xe Namnoy (Midstream + Downstream)

(1) Basic Conditions in Comparison with the Alternative

The project consists of the following characteristics.

- Installed Capacity	305	MW
- Firm Capacity	296	MW
- Sending-out Energy	1,370.2	GWh
- Project Cost	433.22	M.US\$

More detailed conditions in comparison with the alternative are shown in Table 17.4-1.

(2) Result of Economic Analysis and Sensitivity Test

The EIRR for the basic conditions resulted in 16.67% as demonstrated in Table 17.4-2.

The results of sensitivity test are shown in below. The EIRR exceeds the ARI (10%) well. The Xe Namnoy (Mid + Down) Project is expected to be good economic return and the project will be still economically feasible even though for the severer case (below table c).

a) Construction Cost

Condition	Construction Cost	EIRR (%)
Base Case	1,464 \$/kW	16.67
20 % up	1,756 \$/kW	12.69

b) Generation Energy

Condition	Construction Cost	EIRR (%)
Base Case	1,384.0 GWh	16.67
25 % less	1,038.0 GWh	14.20

c) **Construction Cost (20 % up) + Generation Energy (25 % less)**

Condition	Construction Cost	EIRR (%)
20 % up	1,756 \$/kW	10.65
25 % less	1,038.0 GWh	

d) **Transmission Line up to the Thailand Border**

Case	Construction Cost	EIRR (%)
Base Case	1,464 \$/kW (433.2 M.US\$)	16.67
Case 1 (Allocated)	1,575 \$/kW (466.3 M.US\$)	14.89
Case 2 (Independent)	1,561 \$/kW (462.1 M.US\$)	15.10

17.4.2 Xe Namnoy (Midstream)

(1) **Basic Conditions in Comparison with the Alternative**

The project consists of the following characteristics.

- Installed Capacity	238	MW
- Firm Capacity	230	MW
- Sending-out Energy	1,041.5	GWh
- Project Cost	281.81	M.US\$

More detailed conditions in comparison with the alternative are shown in **Table 17.4-3**.

(2) **Result of Economic Analysis and Sensitivity Test**

The EIRR for the basic conditions resulted in 21.83% demonstrated in **Table 17.4-4**. The results of sensitivity test are shown in below. The EIRR gives the highest value among the three project sites (four plans). The project can be expected excellent return and the project will be worth materializing well even though for the severer case (below table c)).

a) **Construction Cost**

Condition	Construction Cost	EIRR (%)
Base Case	1,225 \$/kW	21.83
30 % up	1,593 \$/kW	14.38

b) **Generation Energy**

Condition	Construction Cost	EIRR (%)
Base Case	1,052.0 GWh	21.83
30 % less	736.4 GWh	18.36

c) **Construction Cost (30 % up) + Generation Energy (30 % less)**

Condition	Construction Cost	EIRR (%)
30 % up	1,593 \$/kW	11.71
30 % less	736.4 GWh	

d) **Transmission Line up to the Thai Border**

Case	Construction Cost	EIRR (%)
Base Case	1,225 \$/kW (281.8 M.US\$)	21.83
Case 1 (Allocated)	1,369 \$/kW (314.9 M.US\$)	18.18
Case 2 (Independent)	1,351 \$/kW (310.7 M.US\$)	18.58

Table 17.4-1 Basic Conditions for Xe Namnoy (Mid + Down) and the Alternative

Items	Xe Namnoy (Mid + Down)	Combined Cycle	Remarks
Installed Capacity	(305 MW)	398.9 MW	
Firm Capacity	296 MW *1	398.9 MW *2	*1 Peak 8 Hours *2 Equivalent capacity for the firm of the project.
Available Output at Sending-out	285.3 MW	285.3 MW	Firm Capacity x P.Available Factor x (1 - Station Use)
Generation Energy	1,384 GWh	1,442.3 GWh	Annual Average Energy
Sending-out Energy	1,370.2 GWh	1,370.2 GWh	Generation Energy x (1 - Station Use)
Construction Cost for Firm Capacity	433.22 M.US\$ * 1,463.58 \$/kW	296.85 M.US\$ 744.17 \$/kW	*Transmission Line up to Ban Houaykong is inclusive.
Construction Period	5 years * 9.41, 15.61, 27.68, 30.43, 16.87%	3 years 25, 32.5, 42.5 %	* Including Preparatory Works

Table 17.4-3 Basic Conditions for Xe Namnoy (Mid) and the Alternative

Items	Xe Namnoy (Mid)	Combined Cycle	Remarks
Installed Capacity	(238 MW)	309.9 MW	
Firm Capacity	230 MW *1	309.9 MW *2	*1 Peak 8 Hours *2 Equivalent capacity for the firm of the project.
Available Output at Sending-out	221.7 MW	221.7 MW	Firm Capacity x P.Available Factor x (1 - Station Use)
Generation Energy	1,052 GWh	1,096.3 GWh	Annual Average Energy
Sending-out Energy	1,041.5 GWh	1,41.5 GWh	Generation Energy x (1- Station Use)
Construction Cost for Firm Capacity	281.81 M.USS * 1,225.26 \$/kW	230.62 M.USS 744.17 \$/kW	*Transmission Line up to Ban Houaykong is inclusive.
Construction Period	5 years * 10.20, 15.96, 26.81, 30.56, 16.47 %	3 years 25, 32.5, 42.5 %	* Including Preparatory Works

18. Financial Analysis

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18. Financial Analysis

18.1 Methodology of Financial Analysis and Conditions

18.1.1 Methodology

The most concern for the Bankers is whether the project will be run sound financially after the commencement of commercial operation because the debt service which the project owes will be repaid by the annual revenue only.

Therefore, financial analysis is to be carried out to appraise the project's feasibility from the view point of the financial management. There are many financial indices to explain the financial condition of the project, such as Debt Service Coverage Ratio, Current Ratio, Return on Total Asset, etc.. In this chapter, Debt Service Coverage Ratio (DSC) is used as an index for judging financial soundness of the project. Furthermore, Financial Internal Rate of Return (FIRR) is also calculated to evaluate the rate of profit return.

(1) Debt Service Coverage Ratio (DSC)

DSC is defined by following formula:

$$\text{DSC} = \frac{\text{Current Asset in Cash}}{(\text{Principal Repayment} + \text{Interest Payment})}$$

Where:

Current Asset in Cash = Net Operation Income + Depreciation

According to IBRD's guide line, more or equal to 1.5 is desirable as DSC value.

(2) Financial Internal Rate of Return (FIRR)

FIRR is calculated for the repayment period and the BOT period by the following formula.

$$FIRR = r (\%)$$

Where

$$\sum_{t=0}^n \frac{Ct}{(1+r)^t} = \sum_{t=0}^n \frac{Bt}{(1+r)^t}$$

Ct: Project Cost (Construction Cost + Royalty during Construction + Principal Repayment)

Bt: Net Income after Tax + Depreciation + Interest Payment

t : year

n : study period (years)

r : discount rate (%)

The financial feasible condition is defined as the following conditions;

- DSC exceeds or equals to 1.5 and
- FIRR for the repayment period exceeds or equals to financial cost (interest rate) or
- FIRR for the BOT period exceeds or equals to financial cost.

18.1.2 Conditions

(1) Accounting Structure

The following tables illustrate the accounting structure used in the financial analysis. The structure are referred to ADB report concerning to Nam Thuen 1-2 Hydropower Project.

	Sales Revenue
less	O/M Cost
less	Royalty
less	Depreciation
=	Net Operation Income
less	Interest Payment
=	Income before Tax
less	Tax
=	Net Income after Tax

=	Net Operation Income
plus	Depreciation
=	Current Asset in Cash

=	Net Income after Tax
plus	Depreciation
plus	Interest Payment
=	Net Profit

(2) Materializing Method of the Project

Two (2) materializing methods for the projects are assumed as follows.

(2.1) Materialized by the Lao Government (Case-A)

- a) The Lao Government (EDL) will materialize the project by their own finance and by official loan such as ADB's loan, IBRD's loan and OECF's loan.

(2.2) Materialized by BOT (Build-Operate-Transfer) (Case-B)

- a) The Lao Government will establish the subsidiary (Lao PDR)
- b) Private company will joint the project.
- c) Both parties will establish the new electricity company.
- d) The Government will borrow a part of required money from the official institutes.
- e) The Government will re-lend the borrowing money to the subsidiary as a part of equity of new company which the subsidiary shall prepare, and the Government will receive the dividend.
- f) The new company will borrow the required money up to 70 % of the construction cost by the external institutes.

(3) Financial Common Conditions

Financial common conditions applied to the financial analysis for Case-A and Case-B are shown in Table 18.1-1 and Table 18.1-2.

(4) Treatment of Transmission Line

The construction cost of transmission line up to the Ban Houaykong substation is included in the basic condition of each project site. Other additional two (2) cases concerning the transmission line up to the Thai border are also incorporated in this chapter. Case 1 and Case 2 are called "allocated transmission line system" and "independent transmission line" respectively (details are explained in Chapter 12).

Table 18.1-1 Common Conditions for Financial Analysis
(Case-A: Materialized by the Lao Government)

Items	Value and Conditions
Financing Proportion a/	Own Finance 10 % Official Loan 80 % Bilateral Loan 10 %
Loan Conditions a/	6.0 % for interest rate and 25 years repayment period
Graced Period	During Construction
Project Life Time	50 years
Initial Fixed Asset a/	Construction Cost after escalation + IDC
Depreciation Method	Constant Value Method
Income Tax	20 %
Export/Domestic a/	100/0 (All salable energy will be allocate for export provisionally.)
Export Tariff in year 0 b/	52.41 US\$/MWh ($39.00 \times (1+0.03)^{10} = 52.41$)
Export Tariff Escalation	1.0 % per year
Domestic Tariff in Year 0 c/	34.33 US\$/MWh ($28.17 \times (1+0.02)^{10} = 34.33$)
Domestic Tariff Escalation a/	1.0 % per year
Increase of Domestic Consumption a/	0.0 % per year
Price Escalation	F/C: 2.8 % (IBRD's projection as of 1990) L/C: 4.5 % (Thailand 1990-1993 average)

Note: a/ JICA's assumption or estimate

b/ According to Nam Thuen1-2, tariff escalation up to 3 %/year is accepted by EGAT.

c/ JICA's estimate 20 kip/kWh at 1994 (1 US\$ = 710 kip) equals to 28.17 US\$/MWh.

Table 18.1-2 Common Conditions for Financial Analysis
(Case-B: Materialized by BOT)

Items	Value and Conditions
Share of Equity	Lao PDR : Private = 25:75
Debt/Equity	70/30
Royalty	10 % of Sales Revenue Payment will be made from the first year of the commercial operation.
Interest Rate	10 % for IDC and onwards
Graced Period	During Construction
Repayment Period	10 years
Project Life Time	50 years
Initial Fixed Asset a/	Construction Cost after escalation + IDC
Depreciation Method	Constant Value Method
Income Tax	20 %
Export/Domestic a/	100/0 (All salable energy will be allocate for export provisionally.)
Export Tariff in year 0 b/	52.41 US\$/MWh ($39.00 \times (1+0.03)^{10} = 52.41$)
Export Tariff Escalation	1.0 % per year
Domestic Tariff in Year 0 c/	34.33 US\$/MWh ($28.17 \times (1+0.02)^{10} = 34.33$)
Domestic Tariff Escalation a/	1.0 % per year
Increase of Domestic Consumption a/	0.0 % per year
Price Escalation	F/C: 2.8 % (IBRD's projection as of 1990) L/C: 4.5 % (Thailand 1990-1993 average)

Note: a/ JICA's assumption or estimate

b/ According to Nam Thuen1-2, tariff escalation up to 3 %/year is accepted by EGAT.

c/ JICA's estimate 20 kip/kWh at 1994 (1 US\$ = 710 kip) equals to 28.17 US\$/MWh.

18.2 Se Kong No.4 Project

18.2.1 Basic Conditions of Se Kong No.4

The project consists of following characteristics.

- Installed Capacity	.....	443	MW
- Firm Capacity	.....	406	MW
- Salable Energy	.....	1,616.2	GWh
- Construction Cost	.....	643.61	M.US\$

More detailed conditions are shown in Table 18.2-1.

18.2.2 Results of Financial Analysis and Sensitivity Test

(1) Case-A

The results are shown in below and more detailed information are shown in Table 18.2-2, Table 18.2-4 and Table 18.2-5.

Case	DSC	FIRR	Levelized Financial Generation Cost *
Base	1.61	24.55%	56.93 \$/MWh
Case 1	1.46	22.75%	61.33 \$/MWh
Case 2	1.47	22.86%	61.04 \$/MWh

* with 10 % discount rate for the project life time (50 years)

DSC and FIRR almost satisfy the feasible conditions, say 1.5 point for DSC and 6.0% for FIRR. The project is expected good return.

(2) Case-B

The results are shown in below and more detailed information are shown in Table 18.2-3, Table 18.2-6 and Table 18.2-7.

Case	DSC	FIRR	Levelized Financial Generation Cost *	FIRR for BOT Period (25 years)
Base	0.85	- 9.85%	78.15 \$/MWh	8.03%
Case 1	0.78	- 19.25%	83.79 \$/MWh	6.88%
Case 2	0.78	-18.26%	83.42 \$/MWh	6.96%

* with 10 % discount rate for the project life time (50 years)

DSC and FIRR indicate that the project to be proceeded by BOT method cannot expect financially sound and good return over the repayment period.

Some reasons why the project cannot expect financially sound are deemed as follows;

- a) Export power tariff to Thailand at the year 0, 52.41 US\$/MWh based on Nam Ngum's export price, seems to be too cheap. Levelized financial generation cost with 10 % discount rate over the project life time is estimated at 78.15 US\$/MWh as shown in above table.
- b) One (1) percent escalation for the export power tariff after commercial operation also seems to be too low. The domestic inflation rate set as four point and half (4.5) % in US\$ term referred to Thailand Consumer Price Index (CPI) exceeds the export power tariff escalation.

The following table shows the feasible condition with varying some parameters independently for the base case. All values described in the below table seems to be unrealistic. Therefore, it is deemed that there is still enough room for the discussion on the BOT method, based on the proposed conditions by MIH.

Parameters	Values	DSC	FIRR	Generation Cost	FIRR (BOT)
Construction Cost	386.16 M.US\$ (20 % less)	1.54	11.43%	48.95 \$/MWh	16.4 %
Exporting Power Tariff Escalation	1.0% to 12.0%	1.56	8.78%	107.38 \$/MWh	19.05%
Interest Rate	not reach feasible	-	-	-	-

Table 18.2-1 Basic Conditions for Se Kong No.4

Items	Value and Conditions	Remarks
Installed Capacity	443 MW	
Firm Capacity	406 MW	Peak 8 Hours
Generation Energy	1,816 GWh	Annual Average Energy
Plant Available Factor	97.373 %	
Sending-end Energy (Salable Energy)	1,616.2 GWh	G.Energy x {1 - (St.Use + T/D Loss)}
Construction Cost including Associated T/L	643.61 M.US\$ F/C: 542.22 M.US\$ L/C: 101.39 M.US\$ 1,452.84 \$/kW	subject to price escalation F/C: 2.8 % L/C: 4.5 %
Construction Period	9 years *	including Preparatory Works

* F/C: 7.42, 3.44, 10.41, 13.04, 11.59, 16.36, 16.98, 13.88, 6.88 (%)

L/C: 11.00, 5.27, 11.87, 14.35, 11.57, 14.46, 14.50, 12.36, 4.62 (%)

Table 18.2-2 Financial Analysis (1/4) Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - A (Base)			
Construction Cost	1,452.84	US\$/kW	
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,616.2 GWh		
Construction Cost			
Before Price Escalation	643.61	M.US\$	
After Price Escalation	758.66	M.US\$	
Financial Budget	941.57	M.US\$	
	Financial Items	Lao PDR	Private S.
	Own Finance	75.87	0.00
	Loan Amount	682.79	0.00
	IDC	182.91	0.00
	Royalty	-	0.00
	Total	941.57	0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		

Financial Indexes	
Averaged Debt Service Coverage	1.61
Financial Internal Rate of Return	24.55%
FIRR Calculation Period	25 years
BOT Period	-- Years
FIRR for the BOT Period	-

General Inflation	
Foreign	2.80%
Domestic	4.50%
Financial Conditions	
Interest Rate for IDC	6.00%
Interest after Operation	6.00%
Repayment Period	25 yr
Graced Period	9 yr
Government Own finance	10.00%

Income Statement		M.US\$
Sales Revenue	5,460.36	
Operating Expense	4,219.32	
Financial Expense	491.64	
Net Income before Tax	749.40	
Income Tax	(177.96)	
Net Income	571.44	

To the Government		M.US\$
Royalty	0	
Income Tax	177.964	
Interest Payment to Equity	-	
Net Income	177.964	

Financial Generation Cost in	56.93
Year 0 for the project life time	
10.0% Discount Rate	\$/MWh

Table 18.2-2 Financial Analysis (2/4) Construction Disbursement and Loan Amount

Case: - A (Base)

Dam Site:	Se Kong No.4		Equity Proportions		Price Escalation per annum		Finance Condition		Total Construction Cost (M.US\$)				
	Installed	443.00 MW	Lao PDR	Private	F/C Portion	2.8%	IDC	6.00 %	Finance Items	Lao PDR	PRV SCT	PRV SCT	Total
Generation Energy	1,816.0 GWh				L/C Portion	4.5%	Interest Rate	6.00 %	Own Finance	75.87	0.00	0.00	75.87
Salable Energy	1,616.2 GWh						Repayment Period	25 years	Principal Loan	682.79	0.00	0.00	682.79
Project Cost					Debt/Equity Ratio		Graced Period	9 years	IDC	182.91	0.00	0.00	182.91
F/C	1452.84 \$/Kw				Debt	90.0%	LAO Own Finance	10.00 %	Total	941.57	0.00	0.00	941.57
L/C	542.22 M.US\$				Equity	10.0%			Equity / Royalty Fee	0.00	0.00	0.00	-
Total	101.39 M.US\$				Royalty for Construction	0.0%	Exp. Price (\$/MWh)	52.410					
	643.61 M.US\$				Royalty from Operation	0.0%	Dom. Price (\$/MWh)	34.330					

Year	Disbursement before Escalation		Price Index		Disbursement after Escalation		Total Disburse	Finance Proportion		Own Finance Portion		Loan Portion		Loan Cumulative		IDC		Royalty Fee	
	for F/C	for L/C	for F/C	for L/C	for F/C	for L/C		Lao PDR	PRV SCT	Lao PDR	PRV SCT	Lao PDR	PRV SCT	Lao PDR	PRV SCT	Lao PDR	PRV SCT		M.US\$	M.US$
-10	0.00	0.00	1.0000	1.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-9	40.23	11.15	1.0280	1.0450	41.36	11.65	53.01	0.00	0.00	5.30	0.00	47.71	0.00	47.71	0.00	2.86	0.00	0.00	0.00
-8	18.65	5.34	1.0668	1.0920	19.71	5.83	25.54	0.00	0.00	2.55	0.00	22.99	0.00	70.70	0.00	4.24	0.00	0.00	0.00
-7	56.45	12.03	1.0864	1.1412	61.33	13.73	75.06	0.00	0.00	7.51	0.00	67.55	0.00	138.25	0.00	8.30	0.00	0.00	0.00
-6	70.71	14.55	1.1168	1.1925	78.97	17.35	96.32	0.00	0.00	9.63	0.00	86.69	0.00	224.94	0.00	13.50	0.00	0.00	0.00
-5	62.84	11.73	1.1481	1.2462	72.15	14.62	86.77	0.00	0.00	8.68	0.00	78.09	0.00	303.03	0.00	18.18	0.00	0.00	0.00
-4	88.71	14.66	1.1802	1.3023	104.70	19.09	123.79	0.00	0.00	12.38	0.00	111.41	0.00	414.44	0.00	24.87	0.00	0.00	0.00
-3	92.07	14.70	1.2133	1.3609	111.71	20.01	131.72	0.00	0.00	13.17	0.00	118.55	0.00	532.99	0.00	31.98	0.00	0.00	0.00
-2	75.26	12.53	1.2472	1.4221	93.86	17.82	111.68	0.00	0.00	11.17	0.00	100.51	0.00	633.50	0.00	38.01	0.00	0.00	0.00
-1	37.30	4.68	1.2821	1.4861	47.82	6.95	54.77	0.00	0.00	5.48	0.00	49.29	0.00	682.79	0.00	40.97	0.00	0.00	0.00
0	0.00	0.00	1.3180	1.5530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	542.22	101.37			631.61	127.05	758.66	0.00	0.00	75.87	0.00	682.79	0.00	182.91	0.00	0.00	0.00	0.00	0.00

Table 18.2-2 Financial Analysis (3/4) Income Statement

Case: A (Base)		Se Kong No.4		Exporting Ratio		100.0%		Exp. Price (\$/MWh)		52.41		O/M cost		1.5% of T. Debt		Income Tax		20.0%		Initial F.A. (M.US\$)		941.57																			
Dam Site:		443 MW		Domestic Use		0.0%		Dom. Price (\$/MWh)		34.33		Fuel Cost		0.00		Royalty from Operation		0.0%		Life Time (Years)		50																			
Generation Energy		1818.0 GWh		Increase of D. Use		2.0%		Exp. Escalation		1.00%		P Repay.		27.31		Private		100.0%		Initial Dep. (M.US\$)		18.83																			
Saleable Energy		1818.2 GWh		Financial Condition				Dom. Escalation		1.00%		P Repay.		27.31		Dividend		0.0%		F/C Escalation		2.8%																			
Construction Cost		643.81 M.US\$		Interest Rate (%)		6		Royalty		6		P Repay.		27.31		Dividend		2.5%		L/C Escalation		4.5%																			
		Repayment P. (Yr)		25				25												Equiv. Escalation		3.1%																			
Year	Saleable Energy Export GWh	Saleable Energy Domestic GWh	Selling Price Export \$/MWh	Selling Price Domestic \$/MWh	Sales Revenue M.US\$	O/M Cost M.US\$	Royalty M.US\$	Y.Start Fixed Asset M.US\$	Depreciation M.US\$	Y.End Fixed Asset M.US\$	Net Operation Income M.US\$	Principal Repayment M.US\$	Cum. P.Repayment M.US\$	Interest Payment M.US\$	Income before Tax M.US\$	Income Tax M.US\$	Net Income after Tax M.US\$	Current Asset in Cash M.US\$	Debt Service Ratio	Export Price DSC=1.5 \$/MWh																					
0	1818.2	0.0	52.41	34.33	84.71	11.38	0.00	941.57	18.83	922.74	54.50	27.31	27.31	39.33	15.17	15.17	73.33	1.10	68.89																						
1	1816.2	0.0	52.89	34.87	85.55	11.88	0.00	951.34	18.42	931.92	54.24	27.31	54.62	37.69	16.55	16.55	73.66	1.13	67.69																						
2	1816.2	0.0	53.46	35.02	86.40	12.43	0.00	960.81	20.02	940.79	53.95	27.31	81.93	36.05	17.90	17.90	73.97	1.17	66.50																						
3	1816.2	0.0	54.00	35.37	87.27	12.98	0.00	969.95	20.84	949.31	53.64	27.31	109.24	34.41	19.23	19.23	74.26	1.20	65.32																						
4	1816.2	0.0	54.54	35.72	88.15	13.57	0.00	978.74	21.28	957.46	53.30	27.31	136.55	32.77	20.53	20.53	74.58	1.24	64.16																						
5	1816.2	0.0	55.08	36.06	89.02	14.18	0.00	987.14	21.94	965.20	52.90	27.31	163.86	31.14	21.76	4.35	74.84	1.28	63.02																						
6	1816.2	0.0	55.63	36.44	89.91	14.82	0.00	995.12	22.82	972.50	52.47	27.31	191.17	29.50	22.97	4.56	75.09	1.32	61.90																						
7	1816.2	0.0	56.19	36.81	90.81	15.49	0.00	1002.65	23.32	979.33	52.00	27.31	218.48	27.86	24.14	4.83	75.32	1.37	60.79																						
8	1816.2	0.0	56.75	37.19	91.72	16.18	0.00	1009.69	24.04	985.65	51.50	27.31	245.79	26.22	25.28	5.06	75.54	1.41	59.69																						
9	1816.2	0.0	57.32	37.55	92.64	16.91	0.00	1016.21	24.79	991.42	50.94	27.31	273.10	24.58	26.36	5.27	75.73	1.46	58.62																						
10	1816.2	0.0	57.89	37.92	93.56	17.67	0.00	1022.15	25.55	996.60	50.34	27.31	300.41	22.94	27.40	5.48	75.89	1.51	57.57																						
11	1816.2	0.0	58.47	38.30	94.50	18.47	0.00	1027.49	26.35	1001.14	49.69	27.31	327.72	21.30	28.38	5.68	76.03	1.56	56.54																						
12	1816.2	0.0	59.06	38.68	95.45	19.30	0.00	1032.18	27.16	1005.02	48.99	27.31	355.03	19.67	29.32	5.86	76.15	1.62	55.54																						
13	1816.2	0.0	59.65	39.07	96.41	20.17	0.00	1036.18	28.00	1008.18	48.24	27.31	382.34	18.03	30.21	6.04	76.24	1.68	54.56																						
14	1816.2	0.0	60.25	39.46	97.36	21.07	0.00	1039.43	28.87	1010.56	47.44	27.31	409.65	16.39	31.05	6.21	76.31	1.75	53.59																						
15	1816.2	0.0	60.85	39.86	98.35	22.02	0.00	1041.89	29.77	1012.12	46.56	27.31	436.96	14.75	31.81	6.36	76.33	1.81	52.66																						
16	1816.2	0.0	61.46	40.26	99.33	23.01	0.00	1043.50	30.69	1012.81	45.63	27.31	464.27	13.11	32.52	6.50	76.32	1.89	51.75																						
17	1816.2	0.0	62.07	40.66	100.32	24.05	0.00	1044.21	31.64	1012.57	44.63	27.31	491.58	11.47	33.16	6.63	76.27	1.97	50.87																						
18	1816.2	0.0	62.69	41.06	101.32	25.13	0.00	1043.96	32.62	1011.34	43.57	27.31	518.89	9.83	33.74	6.75	76.19	2.05	50.02																						
19	1816.2	0.0	63.32	41.47	102.34	26.26	0.00	1042.69	33.64	1009.05	42.44	27.31	546.20	8.20	34.24	6.85	76.06	2.14	49.20																						
20	1816.2	0.0	63.95	41.89	103.36	27.44	0.00	1040.33	34.68	1005.65	41.24	27.31	573.51	6.56	34.68	6.94	75.92	2.24	48.41																						
21	1816.2	0.0	64.59	42.31	104.39	28.66	0.00	1036.83	35.75	1001.08	39.96	27.31	600.82	4.92	35.04	7.01	75.71	2.35	47.66																						
22	1816.2	0.0	65.23	42.73	105.42	29.97	0.00	1032.11	36.86	995.25	38.59	27.31	628.13	3.28	35.31	7.08	75.45	2.47	46.93																						
23	1816.2	0.0	65.89	43.16	106.49	31.32	0.00	1026.10	38.00	988.10	37.17	27.31	655.44	1.64	35.53	7.11	75.17	2.60	46.25																						
24	1816.2	0.0	66.54	43.59	107.54	32.73	0.00	1018.73	39.18	979.55	35.63	27.31	682.75	0.00	35.63	7.13	74.81	2.74	45.60																						
Sum					5460.36	2031.32	0		2188		1241.04	682.75		491.64	749.4	177.964	571.436	3429.04				1.81																			
																				Average DSC for Repayment		Period																			

Note: Net Operation Income = Sales Revenue - O/M Cost - Royalty - Depreciation

Income before Tax = Net Operation Income - Interest Payment

Current Asset in Cash = Net Operation Income + Depreciation, Debt Service Ratio = Current Asset in Cash / (Principal Repay. + Interest Payment)

The year 25 onwards are not printed in the above table intentionally.

Table 18.2-3 Financial Analysis (1/4) Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - B (Base)			
Construction Cost	1,452.84	US\$/kW	
Equity Share	Lao PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,816.2 GWh		
Construction Cost			
Before Price Escalation	643.61	M.US\$	
After Price Escalation	758.66	M.US\$	
Financial Budget	995.74	M.US\$	
	Financial Items	Lao PDR	Private S.
	Own Finance	56.92	170.70
	Loan Amount	132.75	398.29
	IDC	59.27	177.81
	Royalty	-	0.00
	Total	248.94	746.80
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		
Financial Indices			
Averaged Debt Service Coverage		0.85	
Financial Internal Rate of Return		-9.85%	
FIRR Calculation Period		10 years	
BOT Period			
BOT Period		25 Years	
FIRR for the BOT Period		8.03%	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		10.00%	
Interest after Operation		10.00%	
Repayment Period		10 yr	
Graced Period		9 yr	
Government Own finance		0.00%	
Income Statement			
			M.US\$
Sales Revenue		5,460.36	
Operating Expense		4,891.20	
Financial Expense		238.95	
Net Income before Tax		330.21	
Income Tax		(149.45)	
Net Income		180.76	
To the Government			
			M.US\$
Royalty		546.03	
Income Tax		149.446	
Interest Payment to Equity		-	
Net Income		695.476	
Financial Generation Cost in			
Year 0 for the project life time		78.15	
10.0% Discount Rate		\$/MWh	

Table 18.2-3 Financial Analysis (2/4) Construction Disbursement and Loan Amount

Case: - B (Base)

Dam Site:	Se Kong No.4		Equity Proportions		Price Escalation per annum		Finance Condition		Total Construction Cost (M.US\$)				
	Installed	Generation Energy	Lao PDR	Private	F/C Portion	L/C Portion	IDC	Interest Rate	Finance Items	Lao PDR	PRV.SCT	PRV.SCT	Total
	443.00 MW	1,816.0 GWh	25.0%	75.0%	2.8%	4.5%	10.00 %	10.00 %	Own Finance	56.92	170.70	170.70	227.82
	1,516.2 GWh								Principal Loan	132.75	398.29	398.29	531.04
Salable Energy			70.0%						IDC	59.27	177.81	177.81	237.08
Project Cost	1452.84 \$/Kw		30.0%						Total	248.94	746.80	746.80	995.74
F/C	542.22 M.US\$		0.0%		Exp. Price (\$/MWh)	52.410	LAO Own Finance		Equity / Royalty Fee	56.92	0.00	0.00	-
L/C	101.39 M.US\$		10.0%		Dom. Price (\$/MWh)	34.330							
Total	643.61 M.US\$												

Year	Disbursement before Escalation		Price Index		Disbursement after Escalation		Total Disburse		Finance Proportion		Own Finance Portion		Loan Portion		Loan Cumulative		IDC		Royalty Fee	
	for F/C M.US\$	for L/C M.US\$	for F/C	for L/C	for F/C M.US\$	for L/C M.US\$	M.US\$	M.US\$	Lao PDR M.US\$	PRV.SCT M.US\$	Lao PDR M.US\$	PRV.SCT M.US\$	Lao PDR M.US\$	PRV.SCT M.US\$	Lao PDR M.US\$	PRV.SCT M.US\$	Lao PDR M.US\$	PRV.SCT M.US\$		
																				Lao Equity M.US\$
-10	0.00	0.00	1.0000	1.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-9	40.23	11.15	1.0280	1.0450	41.36	11.65	53.01	38.76	0.00	3.98	11.93	27.83	9.27	27.83	0.93	2.78	0.00	0.00	0.00	0.00
-8	18.65	5.34	1.0568	1.0920	19.71	5.83	25.54	19.15	0.00	1.92	5.75	13.40	4.47	13.40	1.37	4.12	0.00	0.00	0.00	0.00
-7	56.45	12.03	1.0864	1.1412	61.33	13.73	75.06	56.29	0.00	5.63	16.89	39.40	13.14	39.40	2.69	8.06	0.00	0.00	0.00	0.00
-6	70.71	14.55	1.1168	1.1925	78.97	17.35	96.32	72.24	0.00	7.22	21.67	50.57	16.86	50.57	4.37	13.12	0.00	0.00	0.00	0.00
-5	62.84	11.73	1.1481	1.2462	72.15	14.62	86.77	65.08	0.00	6.51	19.52	45.56	15.18	45.56	5.89	17.68	0.00	0.00	0.00	0.00
-4	88.71	14.66	1.1802	1.3023	104.70	19.09	123.79	92.84	0.00	9.29	27.85	64.99	21.66	64.99	8.06	24.18	0.00	0.00	0.00	0.00
-3	92.07	14.70	1.2133	1.3609	111.71	20.01	131.72	98.79	0.00	9.88	29.64	69.15	23.05	69.15	10.36	31.09	0.00	0.00	0.00	0.00
-2	75.26	12.53	1.2472	1.4221	93.86	17.82	111.68	83.76	0.00	8.38	25.13	58.63	19.54	58.63	12.32	36.95	0.00	0.00	0.00	0.00
-1	37.30	4.68	1.2821	1.4861	47.82	6.95	54.77	41.08	0.00	4.11	12.32	28.75	9.58	28.75	13.28	39.83	0.00	0.00	0.00	0.00
0	0.00	0.00	1.3180	1.5530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	542.22	101.37			631.61	127.05	758.66	588.99	0.00	56.92	170.70	398.29	132.75	398.29	59.27	177.81				

Table 18.2-3 Financial Analysis (3/4) Income Statement

Case: - B (Base)		Sa Kong No. 4		Exporting Ratio		O/M cost		1.5% of T. Disb		Income Tax		Initial F.A. (M.US\$)					
Dam Site:		443 MW		Domestic Use		34.33 Fuel Cost		Royalty from Operation		Lao PDR		Life Time (Years)					
Metal Capacity		1816.0 GWh		Increase of D Use		1.00%		Private		Dividend		Initial Dep. (M.US\$)					
Salable Energy		1616.2 GWh		Financial Condition		1.00% P Repay.		53.1 M.US\$.pa		2.5%		F/C Escalation					
Construction Cost		643.61 M.US\$		Interest Rate (%)		10		(not considered)		2.5%		L/C Escalation					
		Repayment P. (Yr)		10						Equity Escalation		3.1%					
Year	Selling Revenue		Sales Revenue	O/M Cost	Royalty	Y Start Fixed Asset	Depreciation	Y End Fixed Asset	Net Operation Income	Principal Repayment	Cum. of P. Repayment	Interest Payment	Income before Tax	Income Tax	Net Income after Tax	Current Asset in Cash	Debt Service Ratio
	Export GWh	Domestic GWh															
0	1616.2	0.0	52.41	34.33	84.71	11.36	8.47	965.74	19.91	975.83	44.95	53.10	47.79	-2.84	64.96	0.84	
1	1616.2	0.0	52.93	34.87	85.55	11.89	8.56	1006.08	20.53	985.55	44.57	53.10	42.48	2.09	85.10	0.88	
2	1616.2	0.0	53.46	35.02	86.40	12.43	8.64	1016.10	21.17	994.93	44.16	53.10	37.17	6.99	85.33	0.72	
3	1616.2	0.0	54.00	35.37	87.27	12.96	8.73	1025.77	21.82	1003.95	43.73	53.10	31.86	11.87	65.55	0.77	
4	1616.2	0.0	54.54	35.72	88.15	13.57	8.82	1035.07	22.50	1012.57	43.26	53.10	26.55	16.71	65.76	0.83	
5	1616.2	0.0	55.08	36.08	89.02	14.18	8.90	1043.98	23.20	1020.76	42.74	53.10	21.24	21.50	65.94	0.86	
6	1616.2	0.0	55.63	36.44	89.91	14.82	8.98	1052.40	23.92	1028.48	42.18	53.10	15.93	26.25	66.10	0.96	
7	1616.2	0.0	56.19	36.81	90.81	15.49	9.08	1060.36	24.66	1035.70	41.58	53.10	10.62	30.96	66.24	1.04	
8	1616.2	0.0	56.75	37.18	91.72	16.16	9.17	1067.81	25.42	1042.39	40.95	53.10	5.31	35.64	66.37	1.14	
9	1616.2	0.0	57.32	37.55	92.64	16.91	9.28	1074.70	26.21	1048.48	40.26	53.10	0.00	40.26	66.47	1.25	
10	1616.2	0.0	57.89	37.92	93.56	17.67	9.36	1080.86	27.02	1053.97	39.51	0.00	0.00	39.51	66.53	0.00	
11	1616.2	0.0	58.47	38.30	94.50	18.47	9.45	1086.64	27.86	1058.78	38.72	0.00	0.00	38.72	66.59	0.00	
12	1616.2	0.0	59.06	38.68	95.45	19.30	9.55	1091.80	28.73	1062.87	37.87	0.00	0.00	37.87	66.60	0.00	
13	1616.2	0.0	59.65	39.07	96.41	20.17	9.64	1096.82	29.62	1066.20	36.98	0.00	0.00	36.98	66.60	0.00	
14	1616.2	0.0	60.25	39.46	97.38	21.07	9.74	1099.25	30.53	1068.72	36.04	0.00	0.00	36.04	66.57	0.00	
15	1616.2	0.0	60.85	39.86	98.35	22.02	9.84	1101.85	31.48	1070.37	35.01	0.00	0.00	35.01	66.49	0.00	
16	1616.2	0.0	61.46	40.26	99.33	23.01	9.93	1103.55	32.46	1071.09	33.93	0.00	0.00	33.93	66.39	0.00	
17	1616.2	0.0	62.07	40.66	100.32	24.05	10.03	1104.23	33.46	1070.83	32.78	0.00	0.00	32.78	66.24	0.00	
18	1616.2	0.0	62.68	41.06	101.32	25.13	10.13	1104.03	34.50	1069.53	31.56	0.00	0.00	31.56	66.06	0.00	
19	1616.2	0.0	63.32	41.47	102.34	26.28	10.23	1102.99	35.57	1067.12	30.28	0.00	0.00	30.28	65.85	0.00	
20	1616.2	0.0	63.96	41.89	103.36	27.44	10.34	1100.20	36.67	1063.53	28.91	0.00	0.00	28.91	65.58	0.00	
21	1616.2	0.0	64.59	42.31	104.39	28.68	10.44	1096.50	37.81	1058.69	27.46	0.00	0.00	27.46	65.27	0.00	
22	1616.2	0.0	65.23	42.73	105.42	29.97	10.54	1091.51	38.98	1052.53	25.93	0.00	0.00	25.93	64.91	0.00	
23	1616.2	0.0	65.88	43.16	106.49	31.32	10.65	1085.16	40.19	1044.97	24.33	0.00	0.00	24.33	64.52	0.00	
24	1616.2	0.0	66.54	43.59	107.54	32.73	10.75	1077.36	41.44	1035.92	22.82	0.00	0.00	22.82	64.06	0.00	
Sum			5460.36	2031.32	546.03	2313.85		568.16	531.00	238.95	330.21	148.446	180.764	2883.01		0.85	
																Average DSC for Repayment Period	

Note: Net Operation Income = Sales Revenue - O/M Cost - Royalty - Depreciation

Income before Tax = Net Operation Income + Depreciation

Current Asset in Cash = Net Operation Income - Interest Payment

Debt Service Ratio = Current Asset in Cash / (Principal Repayment + Interest Payment)

The year 25 onwards are not printed in the above table intentionally.

Table 18.2-3 Financial Analysis (4/4) Financial Internal Rate of Return

Case: - B (Base)

Dam Site:	Se Kong No.4	Equity Proportions		Total construction Cost (M.US\$)			Discount Rate	10.0%	
Install Capacity	443 MW	Lao PDR	25.0%	Finance Items	LAO PDR	PRV SCT	Total	Discounted to Year	0
Generation Energy	1816 GWh	Private	75.0%	Own Finance	56.92	170.7	227.62	B(enefit)	669.39
		Royalty from Operatio	10.0%	Principal Loan	132.75	398.29	531.04	C(cost)	715.42
Construction Cost	643.61 M.US\$	Lao PDR	25.0%	IDC	59.27	177.81	237.08	B/C	0.94
		Private	75.0%	Total	248.94	746.8	995.74	FIRR for the Year	9
				Equity / Royalty Fee	56.92	0		FIRR	-9.85%

(Unit M.US\$)

Year	Own Finance	IDC	Principal Repay.	Interest Payment	Royalty	Total Cost	Net Income after Tax	Depreciation + Interest	Total Income	NPV Convert Index	Net Present Value		NPV Cumulative		Balance B - C before Discount
											Cost	Benefit	Cost (C)	Benefit (B)	
-10	0.00	0.00			0.00	0.00			0.00	2.5937	0.00	0.00	0.00	0.00	0.00
-9	15.91	3.71			0.00	15.91			0.00	2.3579	37.51	0.00	37.51	0.00	-15.91
-8	7.67	5.49			0.00	7.67			0.00	2.1436	16.44	0.00	53.95	0.00	-7.67
-7	22.52	10.75			0.00	22.52			0.00	1.9487	43.88	0.00	97.83	0.00	-22.52
-6	28.89	17.49			0.00	28.89			0.00	1.7716	51.18	0.00	149.01	0.00	-28.89
-5	26.03	23.57			0.00	26.03			0.00	1.6105	41.92	0.00	190.93	0.00	-26.03
-4	37.14	32.24			0.00	37.14			0.00	1.4641	54.38	0.00	245.31	0.00	-37.14
-3	39.52	41.45			0.00	39.52			0.00	1.3310	52.60	0.00	297.91	0.00	-39.52
-2	33.51	49.27			0.00	33.51			0.00	1.2100	40.55	0.00	338.46	0.00	-33.51
-1	16.43	53.11			0.00	16.43			0.00	1.1000	18.07	0.00	356.53	0.00	-16.43
0			53.10	47.79		53.10	-2.84	67.70	64.86	1.0000	53.10	64.86	409.63	64.86	11.76
1			53.10	42.48		53.10	2.09	63.01	65.10	0.9091	48.27	59.18	457.90	124.04	12.00
2			53.10	37.17		53.10	6.99	58.34	65.33	0.8264	43.88	53.99	501.78	178.03	12.23
3			53.10	31.86		53.10	11.87	53.68	65.55	0.7513	39.89	49.25	541.67	227.28	12.45
4			53.10	26.55		53.10	16.71	49.05	65.76	0.6830	36.27	44.91	577.94	272.19	12.66
5			53.10	21.24		53.10	17.20	44.44	61.64	0.6209	32.97	38.27	610.91	310.46	8.54
6			53.10	15.93		53.10	21.00	39.85	60.85	0.5645	29.97	34.35	640.88	344.81	7.75
7			53.10	10.62		53.10	24.77	35.28	60.05	0.5132	27.25	30.82	668.13	375.63	6.95
8			53.10	5.31		53.10	28.51	30.73	59.24	0.4665	24.77	27.64	692.90	403.27	6.14
9			53.10	0.00		53.10	32.21	26.21	58.42	0.4241	22.52	24.78	715.42	428.05	5.32
10			0.00	0.00		0.00	31.61	27.02	58.63	0.3856	0.00	22.60	715.42	450.65	58.63
11			0.00	0.00		0.00	30.98	27.86	58.84	0.3505	0.00	20.62	715.42	471.27	58.84
12			0.00	0.00		0.00	30.30	28.73	59.03	0.3186	0.00	18.81	715.42	490.08	59.03
13			0.00	0.00		0.00	29.58	29.62	59.20	0.2897	0.00	17.15	715.42	507.23	59.20
14			0.00	0.00		0.00	28.83	30.53	59.36	0.2633	0.00	15.63	715.42	522.86	59.36
15			0.00	0.00		0.00	28.01	31.48	59.49	0.2394	0.00	14.24	715.42	537.10	59.49
16			0.00	0.00		0.00	27.14	32.46	59.60	0.2176	0.00	12.97	715.42	550.07	59.60
17			0.00	0.00		0.00	26.22	33.46	59.68	0.1978	0.00	11.80	715.42	561.87	59.68
18			0.00	0.00		0.00	25.25	34.50	59.75	0.1799	0.00	10.75	715.42	572.62	59.75
19			0.00	0.00		0.00	24.22	35.57	59.79	0.1635	0.00	9.78	715.42	582.40	59.79
20			0.00	0.00		0.00	23.13	36.67	59.80	0.1486	0.00	8.89	715.42	591.29	59.80
21			0.00	0.00		0.00	21.97	37.81	59.78	0.1351	0.00	8.08	715.42	599.37	59.78
22			0.00	0.00		0.00	20.74	38.98	59.72	0.1228	0.00	7.33	715.42	606.70	59.72
23			0.00	0.00		0.00	19.46	40.19	59.65	0.1117	0.00	6.66	715.42	613.36	59.65
24			0.00	0.00		0.00	18.10	41.44	59.54	0.1015	0.00	6.04	715.42	619.40	59.54
25						0.00	16.67	42.72	59.39	0.0923	0.00	5.48	715.42	624.88	59.39
26						0.00	15.17	44.05	59.22	0.0839	0.00	4.97	715.42	629.85	59.22
27						0.00	13.58	45.41	58.99	0.0763	0.00	4.50	715.42	634.35	58.99
28						0.00	11.90	46.82	58.72	0.0693	0.00	4.07	715.42	638.42	58.72
29						0.00	10.14	48.27	58.41	0.0630	0.00	3.68	715.42	642.10	58.41
30						0.00	8.29	49.77	58.06	0.0573	0.00	3.33	715.42	645.43	58.06
31						0.00	6.35	51.31	57.66	0.0521	0.00	3.00	715.42	648.43	57.66
32						0.00	4.30	52.90	57.20	0.0474	0.00	2.71	715.42	651.14	57.20
33						0.00	2.15	54.54	56.69	0.0431	0.00	2.44	715.42	653.58	56.69
34						0.00	-0.13	56.23	56.10	0.0391	0.00	2.19	715.42	655.77	56.10
35						0.00	-3.09	57.97	54.88	0.0356	0.00	1.95	715.42	657.72	54.88
36						0.00	-6.19	59.77	53.58	0.0323	0.00	1.73	715.42	659.45	53.58
37						0.00	-9.45	61.62	52.17	0.0294	0.00	1.53	715.42	660.98	52.17
38						0.00	-12.88	63.53	50.65	0.0267	0.00	1.35	715.42	662.33	50.65
39						0.00	-16.46	65.50	49.04	0.0243	0.00	1.19	715.42	663.52	49.04
40						0.00	-20.22	67.53	47.31	0.0221	0.00	1.05	715.42	664.57	47.31
41						0.00	-24.17	69.63	45.46	0.0201	0.00	0.91	715.42	665.48	45.46
42						0.00	-28.29	71.79	43.50	0.0183	0.00	0.80	715.42	666.28	43.50
43						0.00	-32.59	74.01	41.42	0.0166	0.00	0.69	715.42	666.97	41.42
44						0.00	-37.12	76.31	39.19	0.0151	0.00	0.59	715.42	667.56	39.19
45						0.00	-41.86	78.67	36.81	0.0137	0.00	0.50	715.42	668.06	36.81
46						0.00	-46.83	81.11	34.28	0.0125	0.00	0.43	715.42	668.49	34.28
47						0.00	-52.02	83.63	31.61	0.0113	0.00	0.36	715.42	668.85	31.61
48						0.00	-57.44	86.22	28.78	0.0103	0.00	0.30	715.42	669.15	28.78
49						0.00	-63.10	88.88	25.78	0.0094	0.00	0.24	715.42	669.39	25.78
Sum	227.62	237.08	531.00	238.95	0.00	758.62	180.76	2552.80	2733.56		715.42	669.39			1974.94

Note: Financial Generation Cost (FGC) is calculated as below.

$$FGC = \frac{NPV(\text{Own Finance} + IDC + \text{Royalty} + \text{O/M Cost} + \text{Prs Repayment} + \text{Interest Payment})}{NPV(\text{Generation Energy})}$$

Total Cost does not include IDC and Interest Payment for the purpose of FIRR calculation.

Financial Generation Cost in Year 0 at 10.0% discount rate

78.15 \$/MWh

Table 18.2-4 Financial Analysis

Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - A (Case 1: Allocated T/L system)			
Construction Cost	1,565.58 US\$/kW		
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,616.2 GWh		
Construction Cost			
Before Price Escalation	693.55 M.US\$		
After Price Escalation	817.38 M.US\$		
Financial Budget	1,014.38 M.US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	81.74	0.00
	Loan Amount	735.64	0.00
	IDC	197.00	0.00
	Royalty	-	0.00
	Total	1014.38	0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		

Financial Indeces	
Averaged Debt Service Coverage	1.46
Financial Internal Rate of Return	22.75%
FIRR Calculation Period	25 years

BOT Period	-- Years
FIRR for the BOT Period	-

General Inflation	
Foreign	2.80%
Domestic	4.50%
Financial Conditions	
Interest Rate for IDC	6.00%
Interest after Operation	6.00%
Repayment Period	25 yr
Graced Period	9 yr
Government Own finance	10.00%

Income Statement	M.US\$
Sales Revenue	5,460.36
Operating Expense	4,545.82
Financial Expense	529.33
Net Income before Tax	385.21
Income Tax	(138.16)
Net Income	247.05

To the Government	M.US\$
Royalty	0
Income Tax	138.16
Interest Payment to Equity	-
Net Income	138.16

Financial Generation Cost in	61.33
Year 0 for the project life time	
10.0% Discount Rate	\$/MWh

Table 18.2-5 Financial Analysis Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - A (Case 2: Independent T/L)			
Construction Cost	1,558.17 US\$/kW		
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,616.2 GWh		
Construction Cost			
Before Price Escalation	690.27 M.US\$		
After Price Escalation	813.49 M.US\$		
Financial Budget	1,009.57 M. US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	81.36	0.00
	Loan Amount	732.13	0.00
	IDC	196.08	0.00
	Royalty	-	0.00
	Total	1009.57	0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		

Financial Indeces	
Averaged Debt Service Coverage	1.47
Financial Internal Rate of Return	22.86%
FIRR Calculation Period	25 years
BOT Period	-- Years
FIRR for the BOT Period	-
General Inflation	
Foreign	2.80%
Domestic	4.50%
Financial Conditions	
Interest Rate for IDC	6.00%
Interest after Operation	6.00%
Repayment Period	25 yr
Graced Period	9 yr
Government Own finance	10.00%
Income Statement	M.US\$
Sales Revenue	5,460.36
Operating Expense	4,524.17
Financial Expense	526.79
Net Income before Tax	409.40
Income Tax	(140.69)
Net Income	268.71
To the Government	M.US\$
Royalty	0
Income Tax	140.686
Interest Payment to Equity	-
Net Income	140.686
Financial Generation Cost in	61.04
Year 0 for the project life time	
10.0% Discount Rate	\$/MWh

Table 18.2-6 Financial Analysis

Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - B (Case 1: Allocated T/L system)			
Construction Cost	1,565.58 US\$/KW		
Equity Share	Lao PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,616.2 GWh		
Construction Cost			
Before Price Escalation	693.55 M.US\$		
After Price Escalation	817.38 M.US\$		
Financial Budget	1,072.76 M. US\$		
Financial Items	Lao PDR	Private S.	
Own Finance	61.31	183.92	
Loan Amount	143.04	429.11	
IDC	63.84	191.54	
Royalty	-	0.00	
Total	268.19	804.57	
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		
Financial Indeces			
Averaged Debt Service Coverage		0.78	
Financial Internal Rate of Return		-19.25%	
FIRR Calculation Period		10 years	
25 Years			
BOT Period		25 Years	
FIRR for the BOT Period		6.88%	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		10.00%	
Interest after Operation		10.00%	
Repayment Period		10 yr	
Graced Period		9 yr	
Government Own finance		0.00%	
Income Statement			
		M.US\$	
Sales Revenue		5,460.36	
Operating Expense		5,227.47	
Financial Expense		257.04	
Net Income before Tax		(24.15)	
Income Tax		(121.09)	
Net Income		(145.24)	
To the Government			
		M.US\$	
Royalty		546.03	
Income Tax		121.094	
Interest Payment to Equity		-	
Net Income		667.124	
Financial Generation Cost in			
Year 0 for the project life time		83.79	
10.0% Discount Rate		\$/MWh	

Table 18.2-7 Financial Analysis Summary of Financial Analysis

Site Name		Se Kong No.4	
Case: - B (Case 2: Independent T/L)			
Construction Cost	1,558.17 US\$/kW		
Equity Share	Lao PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	443.0 MW		
Generation Energy	1,816.0 GWh		
Sending-end Energy	1,616.2 GWh		
Construction Cost			
Before Price Escalation	690.27 M.US\$		
After Price Escalation	813.49 M.US\$		
Financial Budget	1,067.67 M.US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	61.02	183.04
	Loan Amount	142.36	427.07
	IDC	63.55	190.63
	Royalty	-	0.00
	Total	266.93	800.74
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		
Financial Indices			
Averaged Debt Service Coverage		0.78	
Financial Internal Rate of Return		-18.26%	
FIRR Calculation Period		10 years	
BOT Period			
BOT Period		25 Years	
FIRR for the BOT Period		6.96%	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		10.00%	
Interest after Operation		10.00%	
Repayment Period		10 yr	
Graced Period		9 yr	
Government Own finance		0.00%	
Income Statement			M.US\$
Sales Revenue		5,460.36	
Operating Expense		5,205.20	
Financial Expense		256.27	
Net Income before Tax		(1.11)	
Income Tax		(122.82)	
Net Income		(123.93)	
To the Government			M.US\$
Royalty		546.03	
Income Tax		122.82	
Interest Payment to Equity		-	
Net Income		668.85	
Financial Generation Cost in			83.42
Year 0 for the project life time			
10.0% Discount Rate			\$/MWh

18.3 Xe Kaman No.1 Project

18.3.1 Basic Conditions of Xe Kaman No.1

The project consists of following characteristics.

- Installed Capacity	.....	256	MW
- Firm Capacity	.....	245	MW
- Salable Energy	.....	1,011.9	GWh
- Construction Cost	.....	404.05	M.US\$

More detailed conditions are shown in Table 18.3-1.

18.3.2 Results of Financial Analysis and Sensitivity Test

(1) Case-A

The results are shown in below and more detailed information are shown in Table 18.3-2, Table 18.3-4 and Table 18.3-5.

Case	DSC	FIRR	Levelized Financial Generation Cost *
Base	1.55	27.49%	54.95 \$/MWh
Case 1	1.42	25.37%	58.85 \$/MWh
Case 2	1.38	24.73%	60.10 \$/MWh

* with 10 % discount rate for the project life time (50 years)

Even though FIRR becomes better than that of Se Kong No, 4, DSC becomes slightly lower than that of Se Kong No.4. This phenomenon is perhaps caused by less salable energy in comparison with Se Kong No.4. The project can be expected good return for the base case.

(2) Case-B

The results are shown in below and more detailed information are shown in Table 18.3-3, Table 18.3-6 and Table 18.3-7.

Case	DSC	FIRR	Levelized Financial Generation Cost *	FIRR for BOT Period (25 years)
Base	0.83	-13.68%	74.67 \$/MWh	7.97%
Case 1	0.76	-31.25%	79.61 \$/MWh	6.83%
Case 2	0.74	N/A	81.19 \$/MWh	6.48%

* with 10 % discount rate for the project life time (50 years)

DSC and FIRR shows the same tendency with the Case-A in respect to comparison with Se Kong No.4.

The following table shows the feasible condition with varying some parameters independently for the base case. It is deemed that there is still enough room for the discussion on the BOT method as well as Se Kong No.4 based on the proposed conditions by MIH.

Parameters	Values	DSC	FIRR	Generation Cost	FIRR (BOT)
Construction Cost	242.43 M.US\$ (40% less)	1.50	12.07%	46.87 \$/MWh	17.57%
Exporting Power Tariff Escalation	1.0% to 12.0%	1.51	8.88%	103.90 \$/MWh	20.06%
Interest Rate	not reach feasible	-	-	-	-

Table 18.3-1 Basic Conditions for Xe Kaman No.1

Items	Value and Conditions	Remarks
Installed Capacity	256 MW	
Firm Capacity	245 MW	Peak 8 Hours
Generation Energy	1,137 GWh	Annual Average Energy
Plant Available Factor	97.373 %	
Sending-end Energy (Salable Energy)	1,011.9 GWh	G.Energy x {1- (St.Use + T/D Loss)}
Construction Cost including Associated T/L	404.05 M.US\$ F/C: 342.44 M.US\$ L/C: 61.61 M.US\$ 1,578.32 \$/kW	subject to price escalation F/C: 2.8 % L/C: 4.5 %
Construction Period	7 years *	including Preparatory Works

* F/C: 7.49, 4.73, 17.69, 22.03, 23.28, 16.95, 7.83 (%)

L/C: 12.33, 6.39, 18.32, 21.25, 21.02, 15.24, 5.45 (%)

Table 18.3-2 Financial Analysis (1/4) Summary of Financial Analysis

Site Name		Xe Kaman No.1	
Case: - A (Base)			
Construction Cost	1,578.32	US\$/kW	
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	256.0	MW	
Generation Energy	1,137.0	GWh	
Sending-end Energy	1,011.9	GWh	
Construction Cost			
Before Price Escalation	404.05	M.US\$	
After Price Escalation	488.46	M.US\$	
Financial Budget	585.05	M.US\$	
	Financial Items	Lao PDR	Private S.
	Own Finance	48.84	0.00
	Loan Amount	439.62	-0.00
	IDC	96.59	0.00
	Royalty	-	0.00
	Total	585.05	-0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41	US\$/MWh	
Domestic	34.33	US\$/MWh	
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		

Financial Indices	
Averaged Debt Service Coverage	1.55
Financial Internal Rate of Return	27.49%
FIRR Calculation Period	25 years

BOT Period	--	Years
FIRR for the BOT Period		-

General Inflation		
Foreign	2.80%	
Domestic	4.50%	
Financial Conditions		
Interest Rate for IDC	6.00%	
Interest after Operation	6.00%	
Repayment Period	25 yr	
Graced Period	7 yr	
Government Own finance	10.00%	

Income Statement		M.US\$
Sales Revenue	3,418.75	
Operating Expense	2,667.40	
Financial Expense	316.55	
Net Income before Tax	434.80	
Income Tax	(107.65)	
Net Income	327.15	

To the Government		M.US\$
Royalty	0	
Income Tax	107.654	
Interest Payment to Equity	-	
Net Income	107.654	

Financial Generation Cost in	54.95
Year 0 for the project life time	
10.0% Discount Rate	\$/MWh

Table 18.3-2 Financial Analysis (2/4) Construction Disbursement and Loan Amount

Case - A (Base)

Dam Site:	Xe Kaman No.1		Equity Proportions		Price Escalation per annum		Finance Condition		Total Construction Cost (M.US\$)			
	Installed	256.00 MW	Lao PDR	Private	F/C Portion	2.8%	IDC	6.00 %	Finance Items	Lao PDR	PRV.SCT	Total
Generation Energy	1,137.0 GWh				0.0%		Interest Rate	6.00 %	Own Finance	48.84	0.00	48.84
Salable Energy	1,011.9 GWh		Debt/Equity Ratio				Repayment Period	25 years	Principal Loan	439.62	-0.00	439.62
Project Cost	1578.32 \$/Kw		Debt		90.0%		Graced Period	7 years	IDC	96.59	0.00	96.59
F/C	342.44 M.US\$		Equity		10.0%	Exporting Ratio	100.0%	LAC Own Finance	Total	585.05	-0.00	585.05
L/C	61.61 M.US\$		Royalty for Construction		0.0%	Exp. Price (\$/MWh)	52.410		Equity / Royalty Fee	0.00	0.00	-
Total	404.05 M.US\$		Royalty from Operation		0.0%	Dom. Price (\$/MWh)	34.330					

Year	Disbursement before Escalation		Price Index		Disbursement after Escalation		Total Disburse		Finance Proportion		Own Equity financed by Loan		Loan Portion		Loan Cumulative		IDC		Royalty Fee
	for F/C	for L/C	for F/C	for L/C	for F/C	for L/C	M.US\$	M.US\$	Lao PDR	PRV.SCT	Lao PDR	PRV.SCT	Lao PDR	PRV.SCT	Lao PDR	PRV.SCT	M.US\$	M.US\$	
	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	
-10	0.00	0.00	1.0000	1.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-9	0.00	0.00	1.0280	1.0450	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-8	0.00	0.00	1.0568	1.0920	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-7	25.65	7.60	1.0864	1.1412	27.87	8.67	36.54	0.00	3.65	0.00	32.89	0.00	32.89	0.00	32.89	0.00	1.97	0.00	0.00
-6	16.20	3.94	1.1168	1.1925	18.09	4.70	22.79	0.00	2.28	0.00	20.51	0.00	53.40	0.00	53.40	0.00	3.20	0.00	0.00
-5	60.58	11.29	1.1481	1.2462	69.55	14.07	83.62	0.00	8.36	0.00	75.26	0.00	128.66	0.00	128.66	0.00	7.72	0.00	0.00
-4	75.44	13.09	1.1802	1.3023	89.03	17.05	106.08	0.00	10.61	0.00	95.47	0.00	224.13	0.00	224.13	0.00	13.45	0.00	0.00
-3	79.72	12.95	1.2133	1.3609	96.72	17.62	114.34	0.00	11.43	0.00	102.91	0.00	327.04	0.00	327.04	0.00	19.62	0.00	0.00
-2	58.04	9.39	1.2472	1.4221	72.39	13.35	85.74	0.00	8.57	0.00	77.17	0.00	404.21	0.00	404.21	0.00	24.25	0.00	0.00
-1	26.81	3.35	1.2821	1.4861	34.37	4.98	39.35	-0.00	3.94	0.00	35.41	0.00	439.62	-0.00	439.62	0.00	26.38	0.00	0.00
0	0.00	0.00	1.3180	1.5530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	342.44	61.61			408.02	80.44	488.46	-0.00	48.84	0.00	439.62	-0.00	96.59	0.00	96.59	0.00	96.59	0.00	0.00

Table 18.3-2 Financial Analysis (3/4) Income Statement

Case: - A (Base)		Xe Kamin No.1		Exporting Ratio		Exp. Price (\$/MWh)		O/M cost		1.5% of T. Deb		Initial F.A. (M.US\$)									
Dam Site:		256 MW		Domestic Use		Dom. Price (\$/MWh)		Fuel Cost		Royalty from Operation		20.0% Life Time (Years)									
Initial Capacity:		1137.0 GWh		Increase of D. Use		Exp. Escalation		1.00%		Lao PDR		100.0% Initial Dep. (M.US\$)									
Saleable Energy		1011.9 GWh		Financial Condition		Dom. Escalation		1.00% P Repay.		Private		0.0% F/C Escalation									
Construction Cost		404.05 M.US\$		Interest Rate (%)		6				Dividend		2.5% L/C Escalation									
		Repayment P. (Yr)		25						(not considered)		Equiv. Escalation									
												585.05									
												11.70									
												2.8%									
												4.5%									
												3.1%									
Year	Export GWh	Domestic GWh	Selling Price \$/MWh	Domestic \$/MWh	Selling Price \$/MWh	Revenue M.US\$	O/M Cost M.US\$	Royalty M.US\$	Y. Start Fixed Asset M.US\$	Depreciation M.US\$	Y. End Fixed Asset M.US\$	Net Operation Income M.US\$	Principal Repayment M.US\$	Cum. of P. Repayment M.US\$	Interest Payment M.US\$	Income before Tax M.US\$	Income Tax M.US\$	Net Income after Tax M.US\$	Current Asset in Cash M.US\$	Debt Service Ratio	Export Price DSC=1.5 \$/MWh
0	1011.9	0.0	52.41	34.33	53.03	7.33	0.00	585.05	11.70	573.35	34.00	17.59	17.59	17.59	25.32	8.68	8.68	45.70	1.07	70.84	
1	1011.9	0.0	52.93	34.67	53.56	7.66	0.00	591.12	12.06	579.06	33.84	17.59	17.59	35.17	24.27	9.57	9.57	45.90	1.10	69.61	
2	1011.9	0.0	53.46	35.02	54.10	8.00	0.00	597.01	12.44	584.57	33.66	17.59	17.59	52.76	23.21	10.45	10.45	46.10	1.13	68.38	
3	1011.9	0.0	54.00	35.37	54.64	8.36	0.00	602.89	12.82	588.87	33.46	17.59	17.59	70.34	22.16	11.30	11.30	46.28	1.16	67.18	
4	1011.9	0.0	54.54	35.72	55.19	8.74	0.00	608.76	13.22	594.94	33.23	17.59	17.59	87.93	21.10	12.13	12.13	46.45	1.20	65.98	
5	1011.9	0.0	55.08	36.08	55.74	9.13	0.00	613.38	13.63	598.75	32.96	17.59	17.59	105.51	20.05	12.93	2.59	10.34	1.24	64.81	
6	1011.9	0.0	55.63	36.44	56.28	9.54	0.00	618.34	14.05	604.26	32.70	17.59	17.59	123.10	18.99	13.71	2.74	10.97	1.28	63.65	
7	1011.9	0.0	56.19	36.61	56.86	9.97	0.00	623.02	14.49	608.53	32.40	17.59	17.59	140.88	17.94	14.46	2.89	11.57	1.32	62.51	
8	1011.9	0.0	56.75	37.18	57.43	10.42	0.00	627.39	14.94	612.45	32.07	17.59	17.59	158.27	16.88	15.19	3.04	12.15	1.36	61.39	
9	1011.9	0.0	57.32	37.55	58.00	10.88	0.00	631.44	15.40	616.04	31.71	17.59	17.59	175.85	15.83	15.86	3.18	12.70	1.41	60.29	
10	1011.9	0.0	57.89	37.92	58.58	11.36	0.00	635.14	15.88	619.26	31.32	17.59	17.59	193.44	14.77	16.55	3.31	13.24	1.46	59.21	
11	1011.9	0.0	58.47	38.30	59.17	11.89	0.00	638.46	16.37	622.09	30.91	17.59	17.59	211.02	13.72	17.19	3.44	13.75	1.51	58.16	
12	1011.9	0.0	59.06	38.68	59.76	12.43	0.00	641.37	16.88	624.49	30.45	17.59	17.59	228.81	12.68	17.79	3.56	14.23	1.56	57.12	
13	1011.9	0.0	59.65	39.07	60.36	12.98	0.00	643.85	17.40	626.45	29.96	17.59	17.59	246.19	11.61	18.37	3.67	14.70	1.62	56.10	
14	1011.9	0.0	60.25	39.46	60.97	13.57	0.00	645.87	17.94	627.93	29.46	17.59	17.59	263.78	10.55	18.91	3.78	15.13	1.68	55.12	
15	1011.9	0.0	60.85	39.86	61.57	14.18	0.00	647.40	18.50	628.90	28.89	17.59	17.59	281.36	9.50	19.39	3.88	15.51	1.75	54.16	
16	1011.9	0.0	61.46	40.26	62.18	14.82	0.00	648.40	19.07	629.33	28.30	17.59	17.59	298.95	8.44	19.86	3.97	15.89	1.82	53.22	
17	1011.9	0.0	62.07	40.66	62.81	15.48	0.00	648.84	19.66	629.18	27.67	17.59	17.59	316.53	7.39	20.28	4.06	16.22	1.90	52.32	
18	1011.9	0.0	62.69	41.06	63.44	16.18	0.00	648.88	20.27	628.41	26.99	17.59	17.59	334.12	6.33	20.66	4.13	16.53	1.96	51.44	
19	1011.9	0.0	63.32	41.47	64.07	16.91	0.00	647.89	20.90	628.99	26.26	17.59	17.59	351.70	5.28	20.98	4.20	16.78	2.06	50.61	
20	1011.9	0.0	63.95	41.89	64.71	17.67	0.00	646.43	21.55	624.88	25.49	17.59	17.59	369.29	4.22	21.27	4.25	17.02	2.16	49.79	
21	1011.9	0.0	64.59	42.31	65.36	18.47	0.00	644.25	22.22	622.03	24.67	17.59	17.59	386.87	3.17	21.50	4.30	17.20	2.26	49.02	
22	1011.9	0.0	65.23	42.73	66.01	19.30	0.00	641.31	22.90	618.41	23.81	17.59	17.59	404.45	2.11	21.70	4.34	17.38	2.37	48.27	
23	1011.9	0.0	65.89	43.16	66.67	20.17	0.00	637.58	23.61	613.97	22.89	17.59	17.59	422.04	1.05	21.84	4.37	17.47	2.50	47.56	
24	1011.9	0.0	66.54	43.59	67.33	21.07	0.00	633.00	24.35	608.65	21.91	17.59	17.59	439.62	0.00	21.91	4.38	17.53	2.63	46.89	
Sum						3418.75	1307.89	0	1359.51		751.35	439.63	318.95	434.8	107.654	327.143	2110.86				
																			Average DSC for Repayment		1.55
																			Period		

Note: Net Operation Income = Sales Revenue - O/M Cost - Royalty - Depreciation
 Income before Tax = Net Operation Income - Interest Payment
 Current Asset in Cash = Net Operation Income + Depreciation - Debt Service Ratio = Current Asset in Cash / (Principal Repay. + Interest Payment)
 The year 25 onwards are not printed in the above table intentionally.

Table 18.3-3 Financial Analysis (1/4) Summary of Financial Analysis

Site Name		Xe Kaman No1	
Case: - B (Base)			
Construction Cost	1,578.32 US\$/kW		
Equity Share	Lao PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	256.0 MW		
Generation Energy	1,137.0 GWh		
Sending-end Energy	1,011.9 GWh		
Construction Cost			
Before Price Escalation	404.05 M.US\$		
After Price Escalation	488.46 M.US\$		
Financial Budget	613.67 M.US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	36.64	109.90
	Loan Amount	85.50	256.42
	IDC	31.31	93.90
	Royalty	-	0.00
	Total	153.45	460.22
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		

Financial Indeces	
Averaged Debt Service Coverage	0.83
Financial Internal Rate of Return	-13.68%
FIRR Calculation Period	10 years
BOT Period	
25 Years	
FIRR for the BOT Period	7.97%
General Inflation	
Foreign	2.80%
Domestic	4.50%
Financial Conditions	
Interest Rate for IDC	10.00%
Interest after Operation	10.00%
Repayment Period	10 yr
Graced Period	7 yr
Government Own finance	0.00%
Income Statement	
M.US\$	
Sales Revenue	3,418.75
Operating Expense	3,075.93
Financial Expense	153.87
Net Income before Tax	188.95
Income Tax	(92.56)
Net Income	96.39
To the Government	
M.US\$	
Royalty	341.93
Income Tax	92.558
Interest Payment to Equity	-
Net Income	434.488
Financial Generation Cost in	
Year 0 for the project life time	
10.0% Discount Rate	74.67
	\$/MWh

Table 18.3-3 Financial Analysis (2/4) Construction Disbursement and Loan Amount

Case - B (Base)		Xe Kaman No1		Equity Proportions		Price Escalation per annum		Finance Condition		Total Construction Cost (M.US\$)			
Dam Site:	256.00 MW	Lao PDR	Private	25.0%	F/C Portion	2.8%	IDC	10.00 %	Finance Items	LAO PDR	PRV SCT	Total	
Installed	1,137.0 GWh	Debt/Equity Ratio	Debt	75.0%	L/C Portion	4.5%	Interest Rate	10.00 %	Own Finance	36.64	109.90	146.54	
Salable Energy	1,011.9 GWh	Equity	Equity	70.0%	Exporting Ratio	100.0%	Repayment Period	10 years	Principal Loan	85.50	256.42	341.92	
Project Cost	1578.32 \$/Kw	Royalty for Construction	Royalty from Operation	30.0%	Exp. Price (\$/MWh)	52.410	Graced Period	7 years	IDC	31.31	93.90	125.21	
F/C	342.44 M.US\$			0.0%	Dom. Price (\$/MWh)	34.330	LAO Own Finance	0.00 %	Total	153.45	460.22	613.67	
L/C	61.61 M.US\$			10.0%					Equity / Royalty Fee	36.64	0.00	-	
Total	404.05 M.US\$												

Year	Disbursement before Escalation		Price Index		Disbursement after Escalation		Total Disburse		Finance Proportion		Own Finance Portion		Loan Portion		Loan Cumulative		IDC		Royalty Fee		
	M.US\$	for L/C	for F/C	for L/C	M.US\$	for L/C	M.US\$	M.US\$	Lao PDR	PRV SCT	M.US\$	Lao Equity	PRV SCT	M.US\$	Lao PDR	PRV SCT	M.US\$	M.US\$	M.US\$		
-10	0.00	0.00	1,0000	1,0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-9	0.00	0.00	1,0280	1,0450	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-8	0.00	0.00	1,0568	1,0920	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
-7	25.65	7.60	1,0864	1,1412	27.87	8.67	36.54	36.54	9.14	27.40	0.00	2.74	8.22	6.40	19.18	6.40	19.18	0.64	1.92	0.00	
-6	16.20	3.94	1,1168	1,1925	18.09	4.70	22.79	22.79	5.70	17.09	0.00	1.71	5.13	3.99	10.39	31.14	1.04	3.11	0.00	0.00	
-5	60.58	11.29	1,1481	1,2462	69.55	14.07	83.62	83.62	20.91	62.71	0.00	6.27	18.81	14.64	25.03	75.04	2.50	7.50	0.00	0.00	
-4	75.44	13.09	1,1802	1,3023	89.03	17.05	106.08	106.08	26.52	79.56	0.00	7.96	23.87	18.56	43.59	130.73	4.36	13.07	0.00	0.00	
-3	79.72	12.95	1,2133	1,3609	96.72	17.62	114.34	114.34	28.59	85.75	0.00	8.58	25.73	20.01	63.60	190.75	6.36	19.08	0.00	0.00	
-2	58.04	9.39	1,2472	1,4221	72.39	13.35	85.74	85.74	21.44	64.30	0.00	6.43	19.29	15.01	78.61	235.76	7.86	23.58	0.00	0.00	
-1	26.81	3.35	1,2821	1,4861	34.37	4.98	39.35	39.35	9.84	29.51	0.00	2.95	8.85	6.89	85.50	256.42	8.55	25.64	0.00	0.00	
0	0.00	0.00	1,3180	1,5530	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sum	342.44	61.61			408.02	80.44	488.46	488.46	122.14	366.32	0.00	36.64	109.90	85.50	256.42	31.31	93.90				

Table 18.3-3 Financial Analysis (3/4) Income Statement

Case: - B (Base)		Xe Kaman No1		Exporting Ratio		100.0%		Exp. Price (\$/MWh)		52.43		O/M cost		1.5% of T. Disb		Income Tax		20.0%		Initial F.A. (M.US\$)		613.67			
Dam Site:		256 MW		Domestic Use		0.0%		Dom. Price (\$/MWh)		34.33		Fuel Cost		0.00 \$/MWh		Royalty from Operation		10.0%		Life Time (Years)		50			
Generation Energy		1137.0 GWh		Increase of D. Use		2.0%		Exp. Escalation		1.00%		P. Repay.		34.19 M.US\$.p.a		Lao PDR		25.0%		Initial Dep. (M.US\$)		12.27			
Salable Energy		1011.9 GWh		Financial Condition		Dom. Escalation		1.00%		1.00%		Private		Dividend		75.0%		F/C Escalation		2.5%		L/C Escalation		4.5%	
Construction Cost		404.05 M.US\$		Interest Rate (%)		10		10		10		Royalty P. (yr)		(not considered)		Equiv. Escalation		3.1%							
Year	Selling Revenue		Sales Revenue		O/M Cost	Royalty	Y. Start	Depreciation	Y. End	Net Operation	Principal Repayment	Cum. of P. Repayment	Interest Payment	Income before Tax	Income Tax	Net Income after Tax	Current Asset in Cash	Debt Service Ratio	Export Price						
	Export	Domestic	Export	Domestic	M.US\$	M.US\$	Fixed Asset	M.US\$	Fixed Asset	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$	M.US\$		DSC=1.5						
0	1011.9	0.0	52.41	34.33	53.03	5.30	613.67	12.27	601.40	28.13	34.19	30.77	-2.64	-2.64	-2.64	40.40	0.62	108.78							
1	1011.9	0.0	52.93	34.67	53.56	5.36	820.04	12.65	607.38	27.89	88.38	27.35	0.54	0.54	0.54	40.54	0.66	104.09							
2	1011.9	0.0	53.46	35.02	54.10	5.41	826.22	13.05	613.17	27.64	102.56	23.93	3.71	3.71	3.71	40.66	0.70	99.41							
3	1011.9	0.0	54.00	35.37	54.84	5.46	832.18	13.45	618.73	27.37	136.77	20.52	6.85	6.85	6.85	40.82	0.75	94.76							
4	1011.9	0.0	54.54	35.72	55.19	5.52	837.91	13.87	624.04	27.06	170.96	17.10	9.96	13.06	2.61	41.04	0.80	90.13							
5	1011.9	0.0	55.08	36.06	55.74	5.57	843.39	14.30	629.08	26.74	205.15	13.68	16.12	16.12	3.22	41.20	0.86	85.49							
6	1011.9	0.0	55.63	36.44	56.29	5.63	848.58	14.74	633.85	26.38	239.34	10.26	19.16	13.06	3.83	41.20	0.90	80.89							
7	1011.9	0.0	56.19	36.81	56.86	5.69	853.50	15.20	638.30	26.00	273.54	6.84	22.18	13.06	4.44	41.27	1.00	76.30							
8	1011.9	0.0	56.75	37.18	57.43	5.74	859.09	15.67	642.42	25.60	307.73	3.42	25.18	4.44	5.03	41.31	1.10	71.72							
9	1011.9	0.0	57.32	37.55	58.00	5.80	862.34	16.15	646.19	25.16	341.92	0.00	28.18	5.03	20.13	41.31	1.21	67.18							
10	1011.9	0.0	57.89	37.92	58.58	5.86	865.22	16.66	649.56	24.68	376.14	0.00	24.68	4.94	19.74	41.34	0.00	62.68							
11	1011.9	0.0	58.47	38.30	59.17	5.92	866.70	17.17	652.53	24.19	410.33	0.00	24.19	4.84	19.35	41.36	0.00	58.23							
12	1011.9	0.0	59.06	38.66	59.76	5.98	872.76	17.70	655.06	23.65	444.58	0.00	23.65	4.73	18.92	41.35	0.00	53.78							
13	1011.9	0.0	59.65	39.07	60.36	6.04	875.37	18.25	657.12	23.09	478.83	0.00	23.09	4.62	18.47	41.34	0.00	49.33							
14	1011.9	0.0	60.25	39.48	60.97	6.10	877.49	18.82	658.67	22.48	513.07	0.00	22.48	4.50	17.98	41.30	0.00	44.88							
15	1011.9	0.0	60.85	39.86	61.57	6.16	879.09	19.40	659.69	21.83	547.31	0.00	21.83	4.37	17.46	41.23	0.00	40.43							
16	1011.9	0.0	61.46	40.28	62.19	6.22	880.14	20.00	660.14	21.15	581.55	0.00	21.15	4.23	16.92	41.15	0.00	35.98							
17	1011.9	0.0	62.07	40.66	62.81	6.28	880.80	20.62	659.96	20.43	615.79	0.00	20.43	4.09	16.34	41.05	0.00	31.53							
18	1011.9	0.0	62.69	41.06	63.44	6.34	880.44	21.26	659.18	19.66	650.13	0.00	19.66	3.93	15.73	40.92	0.00	27.08							
19	1011.9	0.0	63.32	41.47	64.07	6.41	879.81	21.92	657.69	18.83	684.37	0.00	18.83	3.77	15.06	40.75	0.00	22.63							
20	1011.9	0.0	63.95	41.89	64.71	6.47	878.08	22.60	655.48	17.97	718.61	0.00	17.97	3.59	14.38	40.57	0.00	18.18							
21	1011.9	0.0	64.59	42.31	65.36	6.54	875.80	23.30	652.50	17.05	752.85	0.00	17.05	3.41	13.64	40.35	0.00	13.73							
22	1011.9	0.0	65.23	42.73	66.01	6.60	872.73	24.03	648.70	16.08	787.09	0.00	16.08	3.22	12.86	40.11	0.00	8.28							
23	1011.9	0.0	65.89	43.16	66.67	6.67	868.81	24.77	644.04	15.06	821.33	0.00	15.06	3.01	12.05	39.83	0.00	3.83							
24	1011.9	0.0	66.54	43.59	67.33	6.73	864.01	25.54	638.47	13.99	855.57	0.00	13.99	2.80	11.19	39.53	0.00	0.00							
Sum					3418.75	1307.89	341.93	1428.11	342.82	153.87	92.558	1768.93	96.392	1768.93	96.392	1768.93	Average DSC for Repayment	0.83							

Note: Net Operation Income = Sales Revenue - O/M Cost - Royalty - Depreciation
 Income before Tax = Net Operation Income - Interest Payment
 Current Asset in Cash = Net Operation Income + Depreciation - Debt Service Ratio = Current Asset in Cash / (Principal Repay. + Interest Payment)
 The year 25 onwards are not printed in the above table intentionally.

Table 18.3-3 Financial Analysis (4/4) Financial Internal Rate of Return

Case: - B (Base)		Equity Proportions		Total construction Cost (M.US\$)			Discount Rate		
Dam Site:	Xe Kaman No1	Lao PDR	25.0%	Finance Items	LAO PDR	PRV SCT	Total	Discounted to Year	10.0%
Install Capacity	256 MW	Private	75.0%	Own Finance	36.64	109.9	146.54	B(enefit)	415.6
Generation Energy	1137 GWh	Royalty from Operatio	10.0%	Principal Loan	85.5	256.42	341.92	C(cost)	441.34
Construction Cost	404.05 M.US\$	Lao PDR	25.0%	Equity / Royalty Fee	36.64	0	0	B/C	0.94
		Private	75.0%	Equity / Royalty Fee	36.64	0	0	FIRR for the Year	9
								FIRR	-13.68%

(Unit M.US\$)															
Year	Own Finance	IDC	Principal Repay.	Interest Payment	Royalty	Total Cost	Net Income after Tax	Depreciation + Interest	Total Income	NPV Convert Index	Net Present Value		NPV Cumulative		Balance B - C before Discount
											Cost	Benefit	Cost (C)	Benefit (B)	
-10	0.00	0.00			0.00	0.00			0.00	2.5937	0.00	0.00	0.00	0.00	0.00
-9	0.00	0.00			0.00	0.00			0.00	2.3579	0.00	0.00	0.00	0.00	0.00
-8	0.00	0.00			0.00	0.00			0.00	2.1436	0.00	0.00	0.00	0.00	0.00
-7	10.96	2.56			0.00	10.96			0.00	1.9487	21.36	0.00	21.36	0.00	-10.96
-6	6.84	4.15			0.00	6.84			0.00	1.7716	12.12	0.00	33.48	0.00	-6.84
-5	25.08	10.00			0.00	25.08			0.00	1.6105	40.39	0.00	73.87	0.00	-25.08
-4	31.83	17.43			0.00	31.83			0.00	1.4641	46.60	0.00	120.47	0.00	-31.83
-3	34.31	25.44			0.00	34.31			0.00	1.3310	45.67	0.00	166.14	0.00	-34.31
-2	25.72	31.44			0.00	25.72			0.00	1.2100	31.12	0.00	197.26	0.00	-25.72
-1	11.80	34.19			0.00	11.80			0.00	1.1000	12.98	0.00	210.24	0.00	-11.80
0			34.19	30.77		34.19	-2.64	43.04	40.40	1.0000	34.19	40.40	244.43	40.40	6.21
1			34.19	27.35		34.19	0.54	40.00	40.54	0.9091	31.08	36.85	275.51	77.25	6.35
2			34.19	23.93		34.19	3.71	36.98	40.69	0.8264	28.26	33.63	303.77	110.88	6.50
3			34.19	20.52		34.19	6.85	33.97	40.82	0.7513	25.69	30.67	329.46	141.55	6.63
4			34.19	17.10		34.19	9.96	30.97	40.93	0.6830	23.35	27.96	352.81	169.51	6.74
5			34.19	13.68		34.19	10.45	27.98	38.43	0.6209	21.23	23.86	374.04	193.37	4.24
6			34.19	10.26		34.19	12.90	25.00	37.90	0.5645	19.30	21.39	393.34	214.76	3.71
7			34.19	6.84		34.19	15.33	22.04	37.37	0.5132	17.55	19.18	410.89	233.94	3.18
8			34.19	3.42		34.19	17.74	19.09	36.83	0.4665	15.95	17.18	426.64	251.12	2.64
9			34.19	0.00		34.19	20.13	16.15	36.28	0.4241	14.50	15.39	441.34	266.51	2.09
10			0.00	0.00		0.00	19.74	16.66	36.40	0.3855	0.00	14.03	441.34	280.54	36.40
11			0.00	0.00		0.00	19.35	17.17	36.52	0.3505	0.00	12.60	441.34	293.34	36.52
12			0.00	0.00		0.00	18.92	17.70	36.62	0.3186	0.00	11.67	441.34	305.01	36.62
13			0.00	0.00		0.00	18.47	18.25	36.72	0.2897	0.00	10.64	441.34	315.65	36.72
14			0.00	0.00		0.00	17.98	18.82	36.80	0.2633	0.00	9.69	441.34	325.34	36.80
15			0.00	0.00		0.00	17.46	19.40	36.86	0.2394	0.00	8.82	441.34	334.16	36.86
16			0.00	0.00		0.00	16.92	20.00	36.92	0.2176	0.00	8.03	441.34	342.19	36.92
17			0.00	0.00		0.00	16.34	20.62	36.96	0.1978	0.00	7.31	441.34	349.50	36.96
18			0.00	0.00		0.00	15.73	21.26	36.99	0.1799	0.00	6.65	441.34	356.15	36.99
19			0.00	0.00		0.00	15.06	21.92	36.98	0.1635	0.00	6.05	441.34	362.20	36.98
20			0.00	0.00		0.00	14.38	22.60	36.98	0.1486	0.00	5.50	441.34	367.70	36.98
21			0.00	0.00		0.00	13.64	23.30	36.94	0.1351	0.00	4.99	441.34	372.69	36.94
22			0.00	0.00		0.00	12.86	24.03	36.89	0.1228	0.00	4.53	441.34	377.22	36.89
23			0.00	0.00		0.00	12.05	24.77	36.82	0.1117	0.00	4.11	441.34	381.33	36.82
24			0.00	0.00		0.00	11.19	25.54	36.73	0.1015	0.00	3.73	441.34	385.06	36.73
25			0.00	0.00		0.00	10.29	26.33	36.62	0.0923	0.00	3.38	441.34	388.44	36.62
26			0.00	0.00		0.00	9.34	27.15	36.49	0.0839	0.00	3.06	441.34	391.50	36.49
27			0.00	0.00		0.00	8.32	27.99	36.31	0.0763	0.00	2.77	441.34	394.27	36.31
28			0.00	0.00		0.00	7.26	28.86	36.12	0.0693	0.00	2.50	441.34	396.77	36.12
29			0.00	0.00		0.00	6.14	29.75	35.89	0.0630	0.00	2.26	441.34	399.03	35.89
30			0.00	0.00		0.00	4.98	30.67	35.65	0.0573	0.00	2.04	441.34	401.07	35.65
31			0.00	0.00		0.00	3.74	31.62	35.36	0.0521	0.00	1.84	441.34	402.91	35.36
32			0.00	0.00		0.00	2.44	32.61	35.05	0.0474	0.00	1.66	441.34	404.57	35.05
33			0.00	0.00		0.00	1.07	33.62	34.69	0.0431	0.00	1.50	441.34	406.07	34.69
34			0.00	0.00		0.00	-0.44	34.66	34.22	0.0391	0.00	1.34	441.34	407.41	34.22
35			0.00	0.00		0.00	-2.32	35.73	33.41	0.0356	0.00	1.19	441.34	408.60	33.41
36			0.00	0.00		0.00	-4.29	36.84	32.55	0.0323	0.00	1.05	441.34	409.65	32.55
37			0.00	0.00		0.00	-6.34	37.98	31.64	0.0294	0.00	0.93	441.34	410.58	31.64
38			0.00	0.00		0.00	-8.52	39.16	30.64	0.0267	0.00	0.82	441.34	411.40	30.64
39			0.00	0.00		0.00	-10.79	40.37	29.58	0.0243	0.00	0.72	441.34	412.12	29.58
40			0.00	0.00		0.00	-13.19	41.63	28.44	0.0221	0.00	0.63	441.34	412.75	28.44
41			0.00	0.00		0.00	-15.67	42.91	27.24	0.0201	0.00	0.55	441.34	413.30	27.24
42			0.00	0.00		0.00	-18.30	44.25	25.95	0.0183	0.00	0.47	441.34	413.77	25.95
43			0.00	0.00		0.00	-21.03	45.62	24.59	0.0166	0.00	0.41	441.34	414.18	24.59
44			0.00	0.00		0.00	-23.90	47.03	23.13	0.0151	0.00	0.35	441.34	414.53	23.13
45			0.00	0.00		0.00	-26.91	48.49	21.58	0.0137	0.00	0.30	441.34	414.83	21.58
46			0.00	0.00		0.00	-30.05	49.99	19.94	0.0125	0.00	0.25	441.34	415.08	19.94
47			0.00	0.00		0.00	-33.34	51.54	18.20	0.0113	0.00	0.21	441.34	415.29	18.20
48			0.00	0.00		0.00	-36.78	53.14	16.36	0.0103	0.00	0.17	441.34	415.46	16.36
49			0.00	0.00		0.00	-40.39	54.78	14.39	0.0094	0.00	0.14	441.34	415.60	14.39
Sum	146.54	125.21	341.92	153.87	0.00	488.46	96.38	1579.98	1676.36		441.34	415.60			1187.90

Note: Financial Generation Cost (FGC) is calculated as below:
 $FGC = NPV(\text{Own Finance} + IDC + \text{Royalty} + \text{O/M Cost} + \text{Prc Repayment} + \text{Interest Payment}) / NPV(\text{Generation Energy})$
 Total Cost does not include IDC and Interest Payment for the purpose of FIRR calculation.

Financial Generation Cost in Year 0 at 10.0% discount rate: 74.87 \$/MWh

Table 18.3-4 Financial Analysis

Summary of Financial Analysis

Site Name		Xe Kaman No.1	
Case: - A (Case 1: Allocated T/L system)			
Construction Cost	1,691.13 US\$/kW		
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	256.0 MW		
Generation Energy	1,137.0 GWh		
Sending-end Energy	1,011.9 GWh		
Construction Cost			
Before Price Escalation	432.93 M.US\$		
After Price Escalation	523.26 M.US\$		
Financial Budget	626.72 M.US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	52.34	0.00
	Loan Amount	470.92	-0.00
	IDC	103.46	0.00
	Royalty	-	0.00
	Total	626.72	-0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		
Financial Indices			
Averaged Debt Service Coverage		1.42	
Financial Internal Rate of Return		25.37%	
FIRR Calculation Period		25 years	
BOT Period		-- Years	
FIRR for the BOT Period		-	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		6.00%	
Interest after Operation		6.00%	
Repayment Period		25 yr	
Graced Period		7 yr	
Government Own finance		10.00%	
Income Statement M.US\$			
Sales Revenue		3,418.75	
Operating Expense		2,857.44	
Financial Expense		339.00	
Net Income before Tax		222.31	
Income Tax		(84.68)	
Net Income		137.63	
To the Government M.US\$			
Royalty		0	
Income Tax		84.682	
Interest Payment to Equity		-	
Net Income		84.682	
Financial Generation Cost in			
Year 0 for the project life time		58.85	
10.0% Discount Rate		\$/MWh	

Table 18.3-5 Financial Analysis

Summary of Financial Analysis

Site Name		Xe Kaman No.1	
Case: - A (Case 2: Independent T/L)			
Construction Cost		1,726.95 US\$/kW	
Equity Share	Lao PDR	Private S.	
	100.0%	0.0%	
Debt / Equity	Debt	Equity	
	90.0%	10.0%	
Installed Capacity	256.0 MW		
Generation Energy	1,137.0 GWh		
Sending-end Energy	1,011.9 GWh		
Construction Cost			
Before Price Escalation	442.10 M.US\$		
After Price Escalation	534.32 M.US\$		
Financial Budget	639.95 M.US\$		
	Financial Items	Lao PDR	Private S.
	Own Finance	53.44	0.00
	Loan Amount	480.88	-0.00
	IDC	105.63	0.00
	Royalty	-	0.00
	Total	639.95	-0.00
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	0.00%		
Financial Indeces			
Averaged Debt Service Coverage		1.38	
Financial Internal Rate of Return		24.73%	
FIRR Calculation Period		25 years	
BOT Period		-- Years	
FIRR for the BOT Period		-	
General Inflation			
Foreign	2.80%		
Domestic	4.50%		
Financial Conditions			
Interest Rate for IDC	6.00%		
Interest after Operation	6.00%		
Repayment Period	25 yr		
Graced Period	7 yr		
Government Own finance	10.00%		
Income Statement		M.US\$	
Sales Revenue	3,418.75		
Operating Expense	2,917.79		
Financial Expense	346.23		
Net Income before Tax	154.73		
Income Tax	(77.95)		
Net Income	76.78		
To the Government		M.US\$	
Royalty	0		
Income Tax	77.952		
Interest Payment to Equity	-		
Net Income	77.952		
Financial Generation Cost in		60.1	
Year 0 for the project life time			
10.0% Discount Rate		\$/MWh	

Table 18.3-6 Financial Analysis

Summary of Financial Analysis

Site Name		Xe Kaman No1	
Case: - B (Case 1: Allocated T/L system)			
Construction Cost	1,691.13 US\$/kW		
Equity Share	Lao PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	256.0 MW		
Generation Energy	1,137.0 GWh		
Sending-end Energy	1,011.9 GWh		
Construction Cost			
Before Price Escalation	432.93	M.US\$	
After Price Escalation	523.26	M.US\$	
Financial Budget	657.36	M.US\$	
	Financial Items	Lao PDR	Private S.
	Own Finance	39.25	117.73
	Loan Amount	91.57	274.71
	IDC	33.53	100.57
	Royalty	-	0.00
	Total	164.35	493.01
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41	US\$/MWh	
Domestic	34.33	US\$/MWh	
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		
Financial Indices			
Averaged Debt Service Coverage		0.76	
Financial Internal Rate of Return		-31.25%	
FIRR Calculation Period		10 years	
BOT Period			
BOT Period		25 Years	
FIRR for the BOT Period		6.83%	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		10.00%	
Interest after Operation		10.00%	
Repayment Period		10 yr	
Graced Period		7 yr	
Government Own finance		0.00%	
Income Statement			
		M.US\$	
Sales Revenue		3,418.75	
Operating Expense		3,270.55	
Financial Expense		164.83	
Net Income before Tax		(16.63)	
Income Tax		(76.20)	
Net Income		(92.83)	
To the Government			
		M.US\$	
Royalty		341.93	
Income Tax		76.196	
Interest Payment to Equity		-	
Net Income		418.126	
Financial Generation Cost in			
Year 0 for the project life time		79.61	
10.0% Discount Rate		\$/MWh	

Table 18.3-7 Financial Analysis

Summary of Financial Analysis

Site Name		Xe Kaman No1	
Case: - B (Case 2: Independent T/L)			
Construction Cost		1,726.95 US\$/KW	
Equity Share	Leo PDR	Private S.	
	25.0%	75.0%	
Debt / Equity	Debt	Equity	
	70.0%	30.0%	
Installed Capacity	256.0 MW		
Generation Energy	1,137.0 GWh		
Sending-end Energy	1,011.9 GWh		
Construction Cost			
Before Price Escalation	442.10 M.US\$		
After Price Escalation	534.32 M.US\$		
Financial Budget	671.27 M.US\$		
	Financial Items	Leo PDR	Private S.
	Own Finance	40.07	120.23
	Loan Amount	93.52	280.50
	IDC	34.26	102.69
	Royalty	-	0.00
	Total	167.85	503.42
Export/Domestic Ratio for Salable Energy			
Export	100.0%		
Domestic	0.0%		
Initial Power Tariff at year 0			
Export	52.41 US\$/MWh		
Domestic	34.33 US\$/MWh		
Power Tariff Escalation			
Export	1.00%		
Domestic	1.00%		
Increase of Domestic Demand	2.00%		
Royalty for Construction Period	0.00%		
Royalty from Operation onwards	10.00%		
Financial Indices			
Averaged Debt Service Coverage		0.74	
Financial Internal Rate of Return		NA	
FIRR Calculation Period		10 years	
BOT Period			
BOT Period		25 Years	
FIRR for the BOT Period		6.48%	
General Inflation			
Foreign		2.80%	
Domestic		4.50%	
Financial Conditions			
Interest Rate for IDC		10.00%	
Interest after Operation		10.00%	
Repayment Period		10 yr	
Graced Period		7 yr	
Government Own finance		0.00%	
Income Statement			
			M.US\$
Sales Revenue		3,418.75	
Operating Expense		3,332.51	
Financial Expense		168.30	
Net Income before Tax		(82.06)	
Income Tax		(71.46)	
Net Income		(153.52)	
To the Government			
			M.US\$
Royalty		341.93	
Income Tax		71.462	
Interest Payment to Equity		-	
Net Income		413.392	
Financial Generation Cost in			
Year 0 for the project life time		81.19	
10.0% Discount Rate		\$/MWh	

18.4 Xe Namnoy Project

18.4.1 Xe Namnoy (Midstream + Downstream)

(1) Basic Conditions of Xe Namnoy (Midstream + Downstream)

The project consists of following characteristics.

- Installed Capacity	.....	305	MW
- Firm Capacity	.....	296	MW
- Salable Energy	.....	1,231.8	GWh
- Construction Cost	.....	433.22	M.US\$

More detailed conditions are shown in Table 18.4-1.

(2) Results of Financial Analysis and Sensitivity Test

a) Case-A

The results are shown in below and more detailed information are shown in Table 18.4-2, Table 18.4-4 and Table 18.4-5.

Case	DSC	FIRR	Levelized Financial Generation Cost *
Basic	1.75	37.28%	46.51 \$/MWh
Case 1	1.59	34.12%	50.19 \$/MWh
Case 2	1.61	34.62%	49.60 \$/MWh

* with 10 % discount rate for the project life time (50 years)

DSC and FIRR indicate that the project will be run financially sound well.