

**Study on Integrated Coal Mine  
and Power Generation Plant in Cambodia**  
**- smart use of Cambodian coal for domestic power improvement -**

**Study Report**

**March 2009**

**Engineering and Consulting Firms Association, Japan**  
**Japan Development Institute (JDI)**



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## Pictures



Active Road Pavement Work



Paved Road Condition



Active Road Improvement Work



Access Road to the Mine Site



Access Road around the Mine Site



Access Road around the Mine Site



Boring Exploration by a Thai Company  
in 2007



Concession 1/Site A



Concession 1/Site B



Concession 2/Site A



Former Logging Community



Logging Palace and a Richer Family

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## Abbreviations

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BBG	Battambang
BHP	BHP Billiton
CDC	Council for the Development of Cambodia
CM	Coal Mine
CMAC	Cambodia Mine Action Center
CPP	Coal Power Plant
CSR	Corporate Social Responsibility
EAC	Electricity Authority of Cambodia
ECFA	Engineering and Consulting Firms Association
EDC	Electricité du Cambodge
EIA	Environmental Impact Assessment
EIA CF	EIA Consulting Firm Certified by EIA Office, MOE
EGAT	Electricity Generating Authority of Thailand
EU	European Union
FDI	Foreign Direct Investment
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
GMS	Great Mekong Sub-Region
HFO	Heavy Fuel Oil
IEA	International Energy Agency
IPP	Independent Power Producer
ITC	Institute of Technology of Cambodia
JBIC	Japan Bank for International Cooperation
JDI	Japan Development Institute
JICA	Japan International Cooperation Agency
JV	Joint Venture
KGC	Kampong Cham
KGT	Kampong Trach
KPT	Kampot
LAO PDR	Lao People's Democratic Republic
MIME	Ministry of Industry, Mines, and Energy
MLMUPC	Ministry of Land Management Urban Planning and Construction
MOE	Ministry of Environment
NH	National Highway
ODA	Official Development Assistance
O&M	Operation and Maintenance
PHN	Phnom Penh
PPP	Public Private Partnership
REE	Rural Electricity Enterprises
SEZ	Special Economic Zone
SHV	Sihanoukville
South Korea	Republic of Korea
SRP	Siam Reap
TKO	Takeo
UNCTAD	United Nation Conference on Trade and Development
UXO	Unexploded ordnance
WB	World Bank Group
WTO	World Trade Organization

## Preface

Japan Development Institute (JDI) has initiated a Cambodia national development plan (Revitalization of Cambodia: Creating a Half Million New Employment by SEZ Scheme) in 2000 and introduced the SEZ Program in 2006. JDI has pioneered Phnom Penh SEZ from February 2006 and completed in October 2008 for the Phase 1. For attracting investors to Phnom Penh SEZ, one of the serious problems was unstable and expensive power supply in Phnom Penh grid by EDC. Electricity tariff in Cambodia was and still is nearly two to three times higher than in the neighboring countries. The public power supply by EDC is not reliable for most of the heavy power users such as hotels, hospitals and manufacturing factories due to sudden and frequent power failure as well as unstable voltage. Therefore, for the Phnom Penh SEZ, a set of 15 MW HFO captive power plants was installed to facilitate heavy power users in the SEZ. Also, JDI has been seeking for possible sources of power which may reduce production cost and increase reliability in Cambodia. In May 2008, Dr. Kobayashi, Chairman of JDI met a coal mining license holder, a Cambodian national mining specialist, to discuss a potential collaboration for the coal mine development and utilization in the northern part of Cambodia. For the response to the license entities' request for a feasibility study, JDI has agreed to carry out a pre feasibility study for an integrated coal mine and power plant project

JDI submitted the pre-feasibility study proposal to Engineering and Consulting Firms Association, Japan (ECFA) to receive partial support for our study. In July 2008, JDI received an approval from ECFA and dispatched study missions in November 2008 and February 2009 as shown below:

Fist Mission: from November 3<sup>rd</sup> to 14<sup>th</sup>, 2008

- Environmental Expert: Shinya Nagaoka
- Regional Planner: Sumiyuki Otsuki
- Civil Engineer: Rikuo Katsumata

Second Mission: from February 6<sup>th</sup> to 13<sup>th</sup>, 2009

- Team Leader: Dr. Shoichi Kobayashi
- Financial Analyst: Dr. Masataka Imamura

During the first mission, the study team visited the coal mining sites and consulted with various government agencies and relevant private entities. Detailed data and information of the coal mine were provided by the coal mining license holder and his consultant. We greatly appreciate the license holder and Mr. Steve as a coal mining expert for the continued support for our study team.

This feasibility study is still at preliminary level due to limited information on the coal mine and variability of construction and power plant cost. However, this study provides basic information of the coal reserve and the quality which indicates sufficient to supply coal for 400 MW power plants for more than 30 years. Since exploration of coal is still on-going and more coal are likely to be discovered in the future. Based on our assessment, the proposed "Integrated Coal Mine and Power Plant project" is very beneficial and feasible for Cambodia. We strongly recommend carrying out a more detailed feasibility study in 2009 and implementing the project as soon as possible. The realization of the proposed domestic coal mining and power generation will be able to improve the electric power sector in Cambodia, which will result in lower electric tariffs and increased reliability of EDC's power system.

Sincerely

Shoichi Kobayashi Ph.D.

Team Leader and Chairman of Japan Development Institute (JDI)

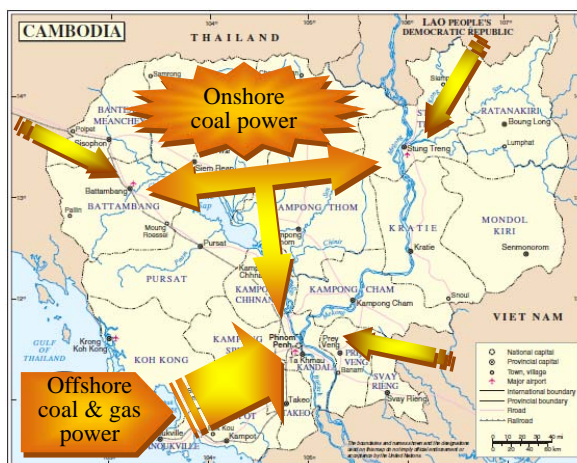


## Executive Summary

Unlike other mineral resources, coal mining has not been tapped in Cambodia although availability of coal reserves has been talked about for a long time as much as other mineral resources. In this study, a practical strategy is analyzed for recently unveiled coal mines in the northern region of Cambodia

With the limited information of the coal characteristics and estimated reserve as well as coal marketability and investment environment in Cambodia, the unveiled coal reserves are likely to contribute to Cambodian economic growth for more than twenty years by improving Cambodian power sector and creating direct skilled and unskilled jobs as well as a wide range of indirect jobs along the Electricite Du Cambodge (EDC)'s new national grids with existing and new local EDC grids - an ongoing nationwide electric grid development by EDC supported by many international aid agencies and development banks such as Japan Bank for International Cooperation (JBIC), Asian Development Bank (ADB), and the World Bank Group (WB)..

The coal reserves may be able to supply sufficient coal for a 400MW coal fired power plant for more than thirty years. Because the sum of generation capacity in the whole nation is less than 250MW in 2005 (EDC), addition of the 400MW capacity will greatly improve the reliability and security of the domestic power supply throughout EDC's new national grid. Due to the domestic coal utilization, Cambodia no longer needs to depend on sharply shifting imported fossil fuel only, which has been adversely impacting on Cambodian economic growth. Although the rising demand for the electricity in Cambodia will surely exceed the capacity of the proposed 400MW power plant shortly, a reliable power system could be provide by smart integration with rather large scale coal fired power plant projects (totally a couple of thousand MW planning) with import coal at existing and planned deep sea ports along the coast of gulf of Thailand and import power from Thailand, Lao PDR, and Vietnam through the ongoing national grid and the ASEAN Power Grid, a panning Great Mekong Sub-Region (GMS) power grid.



### **Craving of Cambodian power infrastructure improvement**

The government has successfully recovered from a half century of chaotic era for last five years, but basic infrastructure improvement is still far from a satisfactory level comparing to the neighboring countries. Considering power sector development, the government's efforts could only achieve scattered and localized mini-grids through the public electric service company, EDC. As a result of the government's limited fund-raising capacity, the government policy on power sector improvement is the effective adaptation of public and private partnership (PPP) to maximize the Cambodian power infrastructure development quickly (Cambodia Power Sector Strategy 1999-2016, MIME 1999).

The government of Cambodia has been providing attractive environment for domestic and foreign investments by aggressive policies on business hosting in Cambodia such as long tax holidays, investment guarantee (multi/bilateral investment treaty) and exemption of import and export taxes for selected activities. As a result, some major cities have been attracting foreign direct investments (FDIs) in the recent years due to the stable governance, favorable investment

policy, and advantages in non-skilled labor availability in Cambodia even without sufficient power supply.

At this moment the price of EDC's electricity for commercial use is roughly two to three times higher than in the neighboring countries due to the small and expensive diesel and HFO power sources. Although there are much higher demands in commercial and industrial sectors, assuming several times higher than present number, most of such businesses could not depend on the EDC's power supply due to the poor electric quality. Most of the commercial and industrial businesses installed and use their own captive generators, typically running with diesel or heavy fuel oil (FHO). Because Cambodia depends on highly expensive imported fuel products with little government's support for competitive electric supply, the security of reliable and economical power has been among the most critical issues for commercial and industrial sectors in Cambodia. Due to the 100% dependency on imported fuels, the continued rise of the fossil fuel price up to July 2008 had adversely affected FDI hosting in Cambodia.

In addition to the commercial demand for economical viable power supply, residential/consumers' demand for access to the electricity has also been serious. As a result of the contentious strong economic growth, the living standards of major city people have been dramatically improved for the last five years. The population of Cambodia has also grown continuously due to the blessing of the social and economical stability. Though there are high and strong demands for electricity as the growing demand for higher living standard, the lack of generation capacity and transmission infrastructures could not simply meet the sharply rising demand for the electricity in each grid. Since the peak load/demand is higher than the installed generation capacity, power failure has frequently happened in each mini grid.

In order to sustain the strong economic growth, Cambodia needs a reasonably sustainable strategy to meet the serious demand for economical power as soon as possible. The proposed project, "Integrated coal mining and power project" would be an ideal solution for the immediate need in Cambodian's present circumstances. The proposed project would be among the most successful PPP projects for not only power sector improvement but also reduction of import energy for Cambodian sustainable development. The project will also contribute to the development of domestic mining and power sectors as well as a wide variety of direct and indirect job creation for a new generation.

### **The nature and evaluation of new coal mine development**

The newly discovered coal mine is located in a northern state with roughly 100km road connection from Seam Reap. The field is geologically categorized within the same terrene as "Low-middle Jurassic red bed" formation which is similar characteristics to known coal deposits of Thailand on the other side of the Cambodia-Thailand border. The access road is available to transport the mining equipments, but some part of the roads and bridges may need improvement to transport heavy equipments for the proposed coal fired power plant.

Based on the given information by the coal mine licensee, the coal deposit for two sites are 34 and 120 million tonnes respectively (totally over 150 million tonnes). The quality of the coal is similar to the Thai coal, which is 3,000kcal and suitable for boiler or kiln fuel. Since the scale of the mining and power project will be one of the largest scale projects in Cambodia, more detail distribution and property of coal is needed to convince potential investors and loan lenders.

Due to the low calorific value, there is little marketability in the international markets. However, it is still attractive enough for an onshore source of Cambodian power generation. Though there are reasonable demands for the new coal mine in major cities and Sihanoukville, the only deep

sea port in Cambodia, for brick and cement industries, the cost and road or rail transport of the coal are hardly attractive for the potential users under current situation. Thus, the integrated coal mining and power generation at the mine site with long term power sales to EDC is the most feasible and attractive option for the potential project owner and government of Cambodia.

This coal mine development project is expected to stimulate Cambodian economy and will enhance improvement of investment environment to spur mutually beneficial business relations with domestic and foreign investors. Two outcomes for public interests are also expected: (i) technical inputs to the government to formulate an integrated mining and power development program with PPP, (ii) technical transfer and practice of the integrated mining and power project anchored in region's sustainable development. In the above context, as a featuring project, coal mining and power generation projects needs to be facilitated in collaboration with various stakeholders' involvements. The several key correlations of concerned stakeholders are shown in Figure. 2 6 Project Formulation Program.

#### Assessment of power generation project attributed from the coal mine development

Due to the government's policy on power sector development, development of power sources except hydro power are mostly developed by IPPs, and the rest of the infrastructures such as high voltage transmission lines and hydro power plants are typically implemented by the government. The first authority to consult with is Ministry of Industry, Mines, and Energy (MIME) for both power generation and coal mining. Those who are interested in receiving a mining or power license may need to explain how the proposed project will comply with the government's policy and contribute to the nation. Once the MIME agrees with the purposed of the project, responsible authorities under mime will be responsible for licensing: Electricity Authority of Cambodia (EAC) for generation license, and department of mineral resources, MIME for mining license (typically addressed by the Minister of MIME). For the power generation license, applicants who want to sell the generated power EDC shall also negotiate with EDC for the purchase agreement of the generated electricity.

With the best available information, a total capacity of 400MW (two units of 200MW) would be the most suitable power project technically and financially. Since the coal power technology is one of the most matured power technologies, the necessary technologies are commercially available on the market. Because the impact of the coal mining and coal power plant is significant, necessary measures should be applied for both mining and power project. In addition to the technical socio-economical, environmental consideration, the project is also required to address the ground mines. The collaboration with the government's special unit, Cambodia Mine Action Center (CMAC) will be mutually beneficial for project developer and government as well as residents in the region.

Though there are no extension plans for the ongoing national grid development by EDC at this moment, the collaboration with the proposed project is able to realize both feasibility of the proposed project and sustainability of EDC's economical power supply. The rough cost estimation of a transmission system between the project site and ongoing national grids (100km) is 51 million US\$ including a 230KV single transmission and two sub-stations.

Based on the recent reference projects and experienced costs by the study team, the cost for the mining and 400MW power projects are as follow:

- |                                       |                   |
|---------------------------------------|-------------------|
| (1) Capital cost of coal mine:        | 40 million USD    |
| (2) Capital cost of coal power plant: | 440 million USD   |
| (3) O&M cost of coal mine             | 25 USD/tonne-coal |
| (4) O&M cost of power plant           | 11 USD/kWh        |

Though the costs and technical analysis are still preliminary level, both coal mine and coal power project are financially attractive level for private investors if the sales price of electricity is higher than 0.09\$US/kWh. Considering the integrated coal mining and power project's feasibility, the project would be attractive level with higher than 0.08\$US/kWh for the long-term sales contract. Considering the long-term stability and recent sales price of electricity in EDC grids, the feasible sales price of the proposed project shall be reasonable for the government of Cambodia.

### **Project formulation plan - the roles of Public and Private Partnership**

#### **1. PPP scheme for the integrated coal mining and power generation project**

This integrated coal mining and power generation project is the first large scale coal-fired power project in Cambodia and most likely to be realized in the Private Public Partnership (PPP) scheme. The coal mine is under the license of private entity and the entity is willing to integrate power generation project as a main user of the coal. In Cambodia, most of power projects have been implemented by the IPP basis along with the master plan on power sector improvement in the past decades. The proposed power generation project is also most likely to be implemented by the IPP scheme, whereas development of transmission line, sub-stations and equipments for environmental protection should be prepared by public sector with supports from international donor communities.

#### **2. Ideal Combination of PPP**

Ideal combination of the roles of stakeholders surrounding the project is as follow:

Role of private sector:

- 1) Coal mining
- 2) Coal-fired power generation

Role of public sector:

- 3) Land mine clearance
- 4) Access road improvement
- 5) Transmission line from the project site to the existing EDC grid in Siem Reap

#### **3. Possible Japanese Consortium Set Up**

Since this study is initiated and subject to identify potential investors for power generation project and related international aid community's assistance, we propose this project to be implemented by a "Consortium." The possible consortium may be consisted of:

- 1) Project promoter/consultant: JDI and other specialized consultants
- 2) Coal and power plant investor/operator: (likely power utility company to be selected)
- 3) Investment and logistics: Japanese trading company (to be selected)
- 4) T/A and F/A: JICA for exploration study and master plan on coal-fired power generation project as well as concessional loan for EDC to develop transmission line in concern.
- 5) Joint Finance: JBIC (Overseas Investment Loans for mining and power project) and private banks' investment loan for the proposed integrated coal mine and power generation project

### **Implications for project mobilization**

This project is one of the most beneficial and urgent projects in Cambodia because Cambodia socio-economic growth potentials have been hindered by the poor, unreliable, and high cost power sector by now. The power sector has been under-developed in Cambodia covering only

15-17% of people. There are only individual urban grid systems available without national grid. Installed capacity of capital cities, Phnom Penh is only 250 MW level right now. The level of the electric charges is the highest level in the region, which is roughly two to three times of Vietnam and Thailand.

Consequently, majority of large electricity users such as hotels, hospitals and manufacturing companies have their own captive generators powered by diesel or HFO. Taken these circumstances into account, promoting investments on manufacturing and tourism to Cambodia has been difficult. Therefore, an immediate action to improve the power sector through realization of the proposed project is necessary, particularly in collaboration between private power and mining operators, and public sector. For speedy implementation of the integrated coal mine and power generation project, we are proposing the following action plan to be undertaken:

1	2009 – 2010	Further exploration of the coal mine area: confirming coal reserve and quality
2	Early 2009 – Mid 2009	Negotiation among investors and financial agencies, development of a consortium
3	Mid 2009 – End 2010	Detail feasibility study for both coal mine and power generation project components simultaneously
4	Mid 2010 – End 2010	Obtain a generation licensee for the 400 MW power plant (MIME/EAC), the project development approval (CDC), long-term off-take agreement(s) (MIME/EDC and/or EGAT for 10 to 20 years)
5	Mid 2010 – End 2010	A financing plan: equity and various loans (JICA (transmission), JBIC and private banks(mining & power), NEXI(insurance)
6	Early 2011 - End 2013	Implementation of coal mine, power generation and transmission line shall be commenced at the same time

## **1 Introduction**

### **1.1 Back ground**

#### **<Power>**

Cambodia has successfully recovered from a half century of chaotic era for last ten years, but basic infrastructure improvement is still far from the satisfactory level comparing to the neighboring countries. Considering power sector development, the government's efforts could only achieve scattered localized mini-grid by the public electric service company - Electricité du Cambodge (EDC).

The government of Cambodia has been providing attractive environment for domestic and foreign investments by aggressive policies on business hosting in Cambodia. As a result, some major cities have been attracting foreign direct investments (FDIs) for recent years due to the stable governance, favorable investment policy, and advantages in non-skilled labor availability in Cambodia even without sufficient power supply.

At this moment the price of EDC's electricity for commercial use is roughly two to three times higher than neighboring countries due to the small and expensive diesel and HFO power sources. Although there are much higher demands in commercial and industrial sectors, assuming several times higher than present numbers, most of such businesses could not depend on the EDC's power supply due to the poor electric quality. Most of the commercial and industrial businesses installed and are using their own captive generators, typically running with diesel or heavy fuel oil (FHO). Because Cambodia depends on highly expensive imported fuel products with little government's support for competitive electric supply, the security of reliable and economical power has been one of the most critical issues for commercial and industrial sectors in Cambodia. Due to the 100% dependency on import fuels, the continuous rise of the fossil fuel price by July 2008 had adversely affected FDI hosting in Cambodia.

In addition to the commercial demand for economical viable power supply, residential/consumers' eager to access the electricity has also been serious. As a result of the contentious strong economic growth the living standards of major cities' people have been dramatically improved for the last five years. The population of Cambodia has also grown continuously due to the blessing of the social and economical stability. Though there are high and strong demands for electricity as the growing demand for higher living standard, the lack of generation capacity and transmission infrastructures could not simply meet the sharply rising demand for the electricity in the each grid. Since the peak load/demand is higher than the installed generation capacity, power failure has frequently occurred in each mini grid.

As a result of limited government funding, the government's policy on power sector improvement is the effective adaptation of public and private partnership (PPP) to maximize the Cambodian power infrastructure development quickly (Cambodia Power Sector Strategy 1999-2016, MIME 1999). However until now, there are no economical power sources available by IPP in Cambodia though there have been some large scale coal power plans in Sihanoukville for a while.

#### **<Coal mine>**

Cambodia's mineral potential is still unknown as most areas of the country have hardly been surveyed for resources. The only mines in production are for marble,



granite and cement, said one source. To attract local and foreign investment in Cambodia's mining sector, a new Law for Management and Mining of Mineral Resources was drafted in 1996 and approved by the Cabinet in 2000. The new Law was promulgated by the Government on July 13, 2001. Mineral potential in Cambodia, as indicated by the Department of Geology and Mines, was for bauxite, coal, gemstones, gold, iron ore, kaolin, limestone, manganese, phosphate rock, quartz, silica sand, and tin (Asian Journal of Mining, 2000). Since 1993, the Ministry of Industry, Mines, and Energy (MIME) reportedly have issued 11 licenses, 5 of which were for gold exploration. The mining sector, the smallest in the economy, contributed 0.16% to the country's GDP in 2001 and employed 4,000 workers in 2000.

## **1.2 Overview of new coal mine development project**

Project profiling and evaluation of the options for effective use of the newly discovered coal reserve in northern Cambodia are the main objective of this study.

Two mining licenses were given to a private Cambodian entity, and boring and property test were carried out for last several years. By 2008, extent of coal reserve was estimated and quality of the coal was examined. With a request from the coal mine licensee, this study team collected the best available information for the coal mine development. A practical strategy by the effective use of PPP for the mine and power sector development is proposed to realize the most beneficial use of the Cambodian coal for the nation and attractive investment project for potential sponsors.

In this study, careful consideration of several options for coal development is attempted with least adverse impacts on environment. The economical significance of the coal exploration contributing to industrial use and the power generation is briefly examined. At the end, a practical strategy to establish and operate an independent power producer (IPP) for the coal reserve with a preliminary financial and economic return is proposed by the collaboration with ongoing Official Development Assistance (ODA) national grid development.

The proposed project, "Integrated coal mining and power project", would be an ideal solution for the immediate need for Cambodian power infrastructure improvement. The project would be one of the most successful PPP projects for not only power sector improvement but also reduction of import energy dependency for Cambodian sustainable development. It will also contribute to the development of mining and power sectors domestically as well as a wide variety of direct and indirect job creation for new generations.

## **2 The nature and evaluation of new coal mine development**

### **2.1 The nature of new coal mine**

The newly discovered coal mine locates in northern state, which has a border with Thailand and roughly 100km road connection from Seam Reap. The field is geologically categorized within the same terrain as Low-Middle Jurassic Red bed formation which is close characteristics to known coal deposits of Thailand. Access road leading to the site is well conditioned compacted laterite road which is now upgraded to paved road by the government. The width of the road is about 20-30m

with several small concrete bridges on the way toward the site (see picture section at the beginning). Prospecting license and exploration license of the coal mine are hold by Cambodian entity. These licenses allow licensee to conduct “the preliminary exploration for determining the presence of mineral of possible commercial value” and “an investigation for the purpose of discovering and testing mineral indices by prospecting, geological, geophysical and geochemical surveying, excavations, drilling, removal and analysis of soils, silts, water, rock and mineral samples, to determine the potential, extent, quality and economic and exploitation feasibility” (Law on Mineral Resource Management and Exploitation, 2001, MLMUPC Cambodia)

The total area covered by these licenses spread in the closely situating two sections of roughly 30,000 and 17,000ha. Through the preliminary exploration with prospecting sampling test (a total of 53 drilling samples) in 2004 to 2005, it is expected that each deposit may reach 34 million tones and 120 million tones respectively. The reserve of coal layer can be found shallow ground at the former reserve (4 to 10m) and relatively shallow ground at the latter reserve (30 to 40m). The open cast mining, the most economical and common way of coal recovery, is suitable for this coal mine.

**Figure. 2-1 Preliminary exploration works**



Source: Coal mine licensee

Laboratory test on mineral samples conducted by coal mine licensee revealed that the characteristics of coal are as follow:

**Table. 2-1 Coal analysis**

Items	Before washed	After washed
Calorific Value (Kcal)	3,000	6,800
Moisture (%)	1.05	1.31
Ash (%)	50.54	19.46
Volatile matter (%)	18.55	17.19
Fixed Carbon (%)	29.86	62.04
Sulfur (%)	0.39	0.96

Source: Coal mine licensee

Based on the preliminary analysis of samples above, coals in this study does not show appreciable coking propensity. However after a beneficiating process by washing the ash level down to 19.46%, the coke type mat be upgraded to greater value. Even thi is so, there is still a discussion to be made as to whether or not beneficiating process with additional cost is necessary for simple coal-burning furnace (which shall be

discussed later). As far as the content of sulfur is concerned, it is relatively low in general. Considering the characteristics of the coal provided, fuel coal for industrial use (electric power generation, cement, etc.) would be unfeasible

## **2.2 Major components to be assessed**

In the prospecting test, the rough estimate of grade and tonnage of the coal deposit was obtained. Prior to making tangible decisions for commercial extraction, much more holistic and highly probable figures of reserve, calorific values, and variable quality between layers in depth need to be ascertained. Particularly, since the inner structure and mineral composition of underground layers of the broader area are still uncertain due to limited sampling, which affects the estimate of the total extractable volume in economically reasonable scale, full-scale exploration works need to be accomplished.

As described earlier, this mine development project is considered to proceed with financial and technical assistances from international donor communities and private investors. There need to be sufficient backups to rationalize the project feasibility of the scoped mine development to determine if there is enough coal with a sufficient grade to warrant commercial extraction and, prospective markets of the coal which will assure income generation.

Hence, there is a need to conduct more intensive, systematic form of exploration works in the scoped field so that resource evaluation can be accomplished to profile the known size of the deposit and coal constitution. The results of the exploration study will, subsequently, be used to convince all the parties involved to launch coal extraction.

## **2.3 Understanding of significance of the new coal mine development**

Reasonable justification for aiding the new coal mine development is potentially three-fold. First, the realization of domestic coal development will be able to help reform and replace imported fuel resources, which will allow the optimal use and savings of the nation's foreign currency. Second, electric power sources can be diversified from current dominant diesel-oil-type of power generation. Third, if large-scale power generation sources from coal at economically reasonable cost are available, cheaper and more stable electricity will be supplied in Cambodia. This would help bring down the operation cost of domestic business activities and lift up the overall investment environment of Cambodia.

Considering the scale of coal deposit derived from early prospecting, realization of the coal mine development is expected to cast significant impacts on Cambodia. The primary impacts can be private sector's voluntary reformation and diversification of the use of imported fuels. Currently, in Cambodia, oil products are the dominant source of energy for economic activities. According to the figure below, 65% of imported oil products consists of heavy fuel and middle distillates which are primarily used for power generation in Cambodia, whereas, based on the available source of import statistics<sup>1</sup>, imported value of petroleum oils, not crude (heading 2710) was USD330million in 2006. The value is 5.6% of GDP in 2006 which is a relatively small portion compared with the neighboring countries<sup>2</sup>. At this point, in contrast

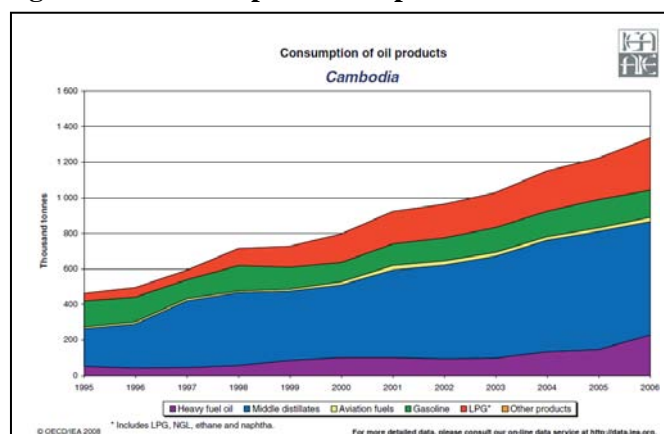
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<sup>1</sup> International Trade Center, UNCTAD/WTO

<sup>2</sup> Vietnam was 10.1% and Lao People's Democratic Republic was 7.7%

with the GDP growth rate of the same neighboring countries<sup>3</sup>, Cambodia has still room for increasing GDP with additional source of energy to stimulate her economy. It has only spent a small portion of the nation's foreign currency for the imported fuel, which is, in turn, suppressing growth potentials of the economy. Coal has not virtually been imported since 2002 to the present. Therefore, once domestic coal became available and coal-fired power generation system installed, the newly discovered coal would take over the position of oil fuel and/or add to the available choice of energy.

**Figure. 2-2 Consumption of oil products in Cambodia**



Source: OECD/IEA

In the view of using coal for power generation, economic benefits accrued from new coal mine development could be broad. With power demand among the existing grid's customers expected to grow at about 13 percent per year during 2003-2008, it is critical that Cambodia look for major sources of power supply for meeting demand beyond (World Bank).

EDC, the government-owned utility service agency, supplies electricity in the major cities in Cambodia, which include the highest power-consuming center of Phnom Penh. Outside the cities, there is off-grid power distribution system operated by small individual power producers (IPPs). EDC has no significant power generation capacity as its own and nearly half of EDC's installed power supply capacity of 140MW is actually supplemented by 2 IPPs (63 MW), and the short and middle term trend and government policy continue to rely on the role of IPPs in Cambodia. Even so, there have been a perpetuating demand and supply gap and additional IPP generation capacity must be installed in Cambodian power supply system so that relatively high quality and reliable power supply especially in Phnom Penh (economic and industrial center) can be attained.

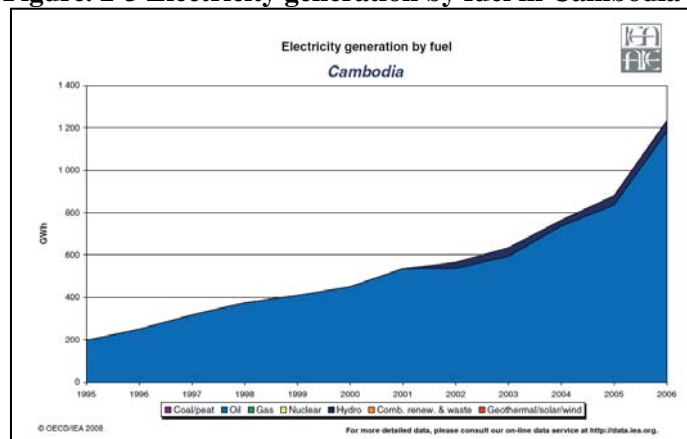
In addition, the Government's plan to increase rural electricity coverage from about 10 percent today to 70 percent by 2030, could be highly ambitious in the present circumstance. EDC faces obstacles in capacity and financial resources to extend its geographically-limited grids into the countryside; besides it is uneconomical to stretch its network to vast remote areas, where electricity demand is minor compared to the cities and high price electricity can not be accepted. Hence, it is the role of IPP to generate large volume of electricity at lower cost, which could bring improvements in

<sup>3</sup> Cambodia: 6%, Lao People's Democratic Republic: 7.1%, Vietnam: 7.4%

the rural electricity accessibility in efficient and effective manner in the end. In order to bridge power supply-demand gap, some of the necessary electricity needs to be purchased from the neighboring countries of Vietnam and Thailand with the development of the Greater Mekong Sub-region grid. Nevertheless, coal-fired power generation based on domestic coal mines can be a more ideal power source to meet the estimated demand at relatively cheap cost.

Last but no least, materialization of coal-fired power station (based on the prospecting result, 400MW is proposed) in Cambodia would provide benefits for electric power security in that Cambodia would become electric power independent and for prosperous investment environment improvement. As for the issue of having independent power supply system, it is obvious that, at present, Cambodian electric power generation depends on petroleum fuel and few alternative sources are available. The concept of getting electricity from neighboring countries is also likely to enhance dependency on outside environment, which in turn makes the national power security vulnerable.

**Figure. 2-3 Electricity generation by fuel in Cambodia**



Source: OECD/IEA

Moreover, having reliable and cheaper supply of electricity from coal-fired power plant at economy-of-scale, the majority of manufacturing company owning some type of individual power generating unit would be relieved from incurring expensive power generation cost. Since expensive electricity cost is one of the operational obstacles in Cambodia, the realization of coal-fired power generation project will surely improve the investment environment of Cambodia.

Hence, this mining project could have significant outcomes to bring a major threshold to the Cambodian economy.

## **2.4 Quick summary of the coal marketability for the new coal mine**

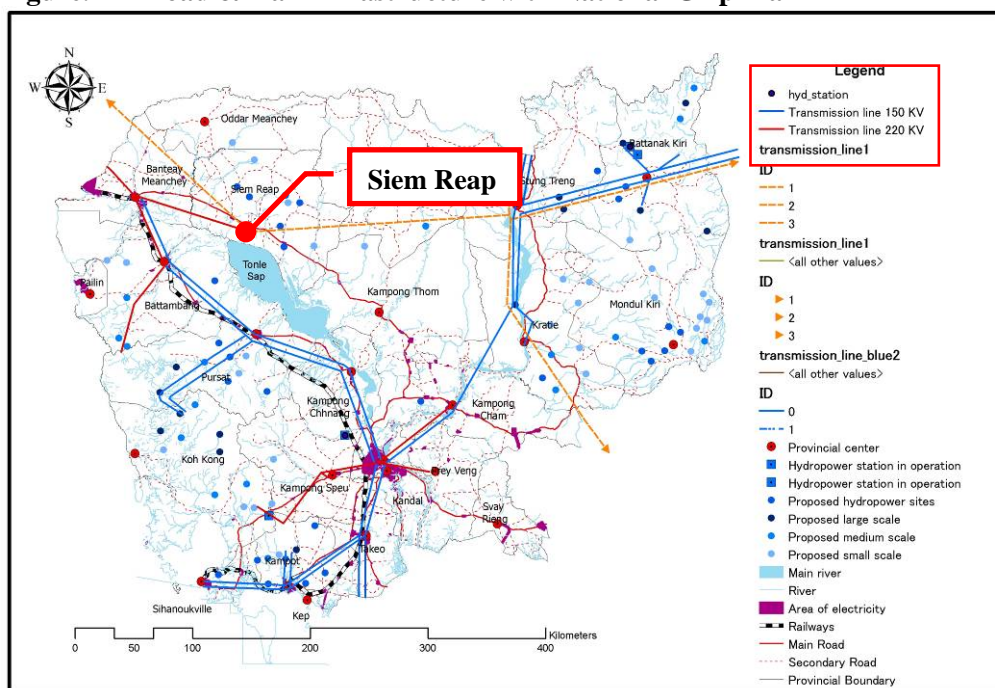
In this section, for the purpose of analytical base, the optimal use of the new coal mine is studied. The following are the quick summary of the three options considered, and our recommendation.

### **2.4.1 Coal fired power generation at the mine site for domestic and international sales**

The first option is to harness the coal at the mine site for power generation, and distribute the power to domestic markets as well as to the Thai market with utilizing

new transmission line to be installed and operated by EDC. The upgrade and an installation of the new transmission line from the mine site, which is about 100km from Siem Reap, to existing transmission networks could be funded as an international aid project due to its characteristic of public interest. As it is emphasized later on, considering the existing and potential demand in the domestic market, the feasibility and the profitability seem to be the highest among the three.

**Figure. 2-4 Road & Rail Infrastructure with National Grip Plan**



#### 2.4.2 Railway shipping/exporting for domestic and international industrial fuel use

The second option is to transport the coal to domestic industrial markets, such as cement, brick manufacturing, metal manufacturing and etc. through the railway to customer's industrial bases. In this context, however, the important section of railway improvement project between Thai border to Phnom Penh planned by ADB has been delayed, and the project realization remains to be seen. Therefore, transportation via railway would be an unavailable option. Road transportation can be also considered, however, if the existing road is to be used, the distance from the mine site to possible markets makes the option costly. Building new roads to major markets also requires extensive investment in road network improvements. Considering the road construction, moreover, to connect the mining site directly to the major cement industrials base in Koh Kong, it needs to construct road through the natural reserve where the habitat of endangered species are located, which poses a doubt in its feasibility (See Figure 2.5). Therefore, this option may not be feasible at this moment.

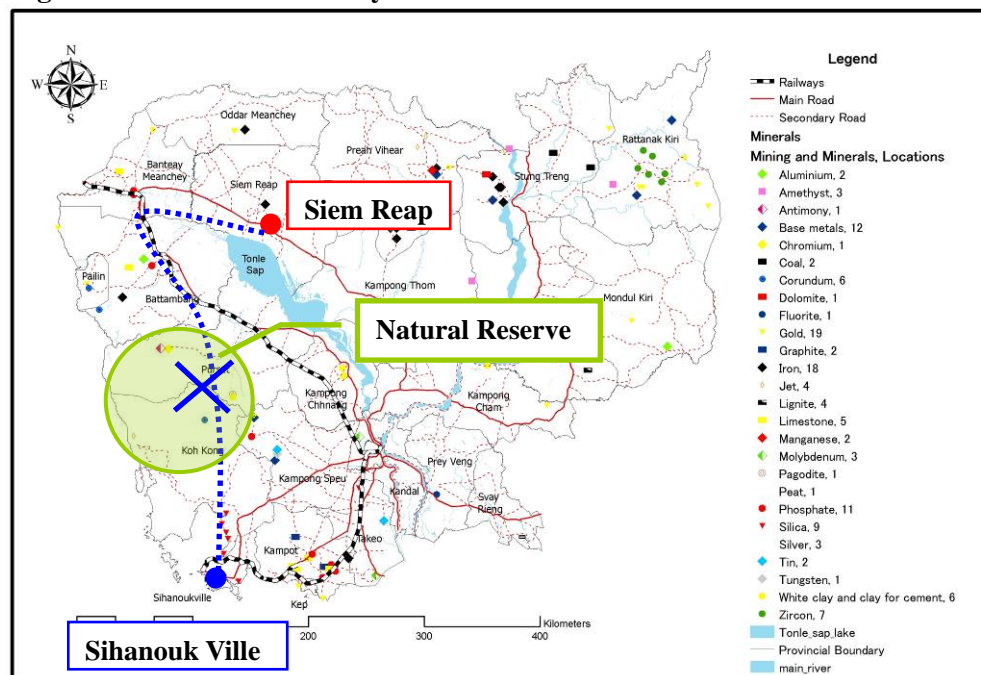
#### 2.4.3 Exporting throughout railway and international port

The third option is to transport the coal to overseas market via Sihanoukville port. As it was mentioned in the second option, railways and roads are both impractical means to transport coal in large volume. Transporting coal by road may also cause environmental impacts by dispersing coal dust. Above all, the calorific value of the new coal is low, thus less competitive against other coals marketed in overseas even with same calorific value by the high cost of land transportation in Cambodia. In the



mean time the coal market in Thailand is out of the scope in this study, since the policy of Thai government needs to be closely studied and, moreover, the characteristic of domestic coal fuel is likely to be focused on the domestic use as it is precious resource for Cambodia as it owns. Consequently, this option would be also less practical to be implemented.

**Figure. 2-5 Road and Railway Networks of Cambodia with Mineral Reserves**



#### 2.4.4 Recommended feasible option

Considering the three options mentioned above, we suggest that the first option of using coal for power generation can be an optimal use of the new coal. As it is shown in Figure 2.4, the current transmission line connects Siem Reap provincial electricity center to other provincial centers of large population, such as Phnom Penh. Therefore, once a new transmission line from the mine site to Siem Reap is constructed, the power harnessed by the new coal can be transmitted to a large electricity market.

In the following section, considering the significance of the project in Cambodia and the involvement of various stakeholders, a project development program to commence coal mining and power generation projects shall be discussed.

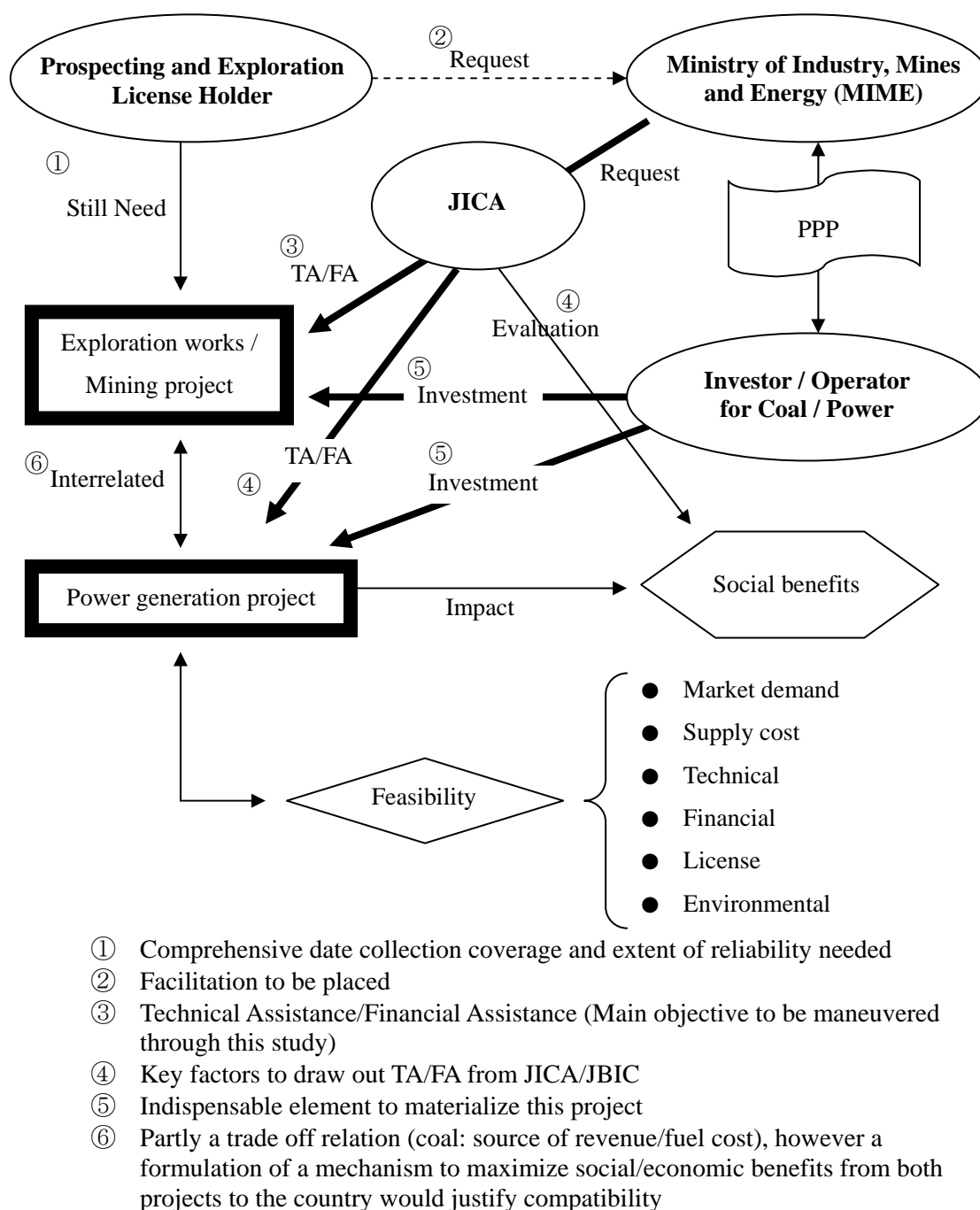
#### 2.5 Program to commence new coal mine and coal fired power plat development

This coal mine development project is expected to stimulate Cambodian economy and will enhance improvement of investment environment to spur mutually beneficial business relations with Japanese and any other private companies, as existing operators and potential investors that will contribute to the long term interests of concerned countries. The impact of the coal-fired power generation is to improve the business environment so that the private sector can operate efficiently and sustainably in the region. Moreover, two outcomes for public interest are also expected: (i) technical inputs to the Government to formulate an integrated mining and power development program, and at the same time increase investment opportunities by extending the efficiency, safety and credibility of electric power utilities for private

sector's operation, and (ii) technical background and practice of the integrated mining and power project anchored in region's sustainable development.

In the above context, as a featuring project, coal mining and power generation projects needs to be facilitated in collaboration with various stakeholders' involvements. The several key correlations of concerned stakeholders are illustrated as follow:

**Figure. 2-6 Project Formulation Program**



The primary objective is to increase coverage of drilling sufficient to satisfy the economic and statutory standards of a coal mine investment. Depending on the assured size of the deposit and the structure of the project, the level of detailed data required to extract the coal and the stage at which power generation can commence shall be determined. In this study proposal, mine exploration and construction of transmission lines to connect a power plant with the power grid in Siam Reap are contemplated to be financed by both debt finance and equity investment. Hence adequate justification of project feasibility to make use of financial assistances to the Cambodian government from international donor communities to construct public infrastructure needs to be presented. In the following section, in this line, an assessment of power generation project is presented.

### 3 Assessment of power generation project attributed from the coal mine development

#### 3.1 Electric power business environment in Cambodia

Due to the stable governance and advantages in non-skilled labor force availability in Cambodia, some major cities, especially in Phnom Penh, have attracted foreign direct investment (FDI) since 2004. (Key Indicators 2008) As a result of the contentious strong economic growth, not only the government's debt service but also the living standards of major city people have been dramatically improved (Table 3-1, 3-2.) The population of Cambodia has also grown continuously due to the blessing of the social and economical stability. (Table 3-3)

**Table. 3-1 Key indicators of the Cambodian strong economic growth**

	1990	1995	2000	2004	2005	2006	2007
Gross domestic product at PPP (current int. \$ million)	-	-	11,437	17,268	20,143	23,013	-
GDP per capita at PPP (current int. \$)	-	-	910	1,274	1,457	1,633	-
Growth rates of real GDP (%)	1.2	6.5	8.4	10.3	13.3	10.8	10.2
Workers' remittances and compensation of employees, receipts (% of GDP)	-	0.3	3.3	3.3	3.2	4.1	-
Foreign direct investment, total net (US\$ million)	94	151	142	121	375	475	866
Merchandise exports (US\$ million)	86	854	1,397	2,589	2,910	3,694	4,089
Growth rates of merchandise exports (%)	8.3	74.3	23.6	24.1	12.4	26.9	10.7
Net private flows a from all sources to developing member countries (US\$ million)	0	164	149	131	379	483	-
Tax revenue (% of GDP)	2.2	5.3	7.3	7.4	7.4	7.6	10.2

Source: ADB Keyindicators2008

**Table. 3-2 Debt Service as a Percentage of Exports of Goods and Services and Net Income from Abroad**

Country	1990	2000	2006
<b>Cambodia</b>	<b>3.8 (1992)</b>	<b>1.4</b>	<b>0.6</b>
Indonesia	25.6	11.1	12.0
Lao PDR	8.5	7.8	9.0 (2001)
Malaysia	10.6	2.8	1.9
Myanmar	18.2	3.4	1.4
Thailand	11.4	5.8	2.1
Vietnam	3.2 (1996)	7.2	2.3 (2005)

Source: ADB Keyindicators2008

(value in %)

**Table. 3-3 Cambodian Growth rates in population 1990-2007**

	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007
Population (Million)	8.6	10.5	12.6	12.8	13.1	13.3	13.5	13.8	14.1	14.4
Growth rate (%)	3.6	5.2	1.8	1.8	2.4	1.7	1.7	2.1	1.9	1.9

Source: ADB Keyindicators2008

(value in million persons)

Though there are high and strong demands for electricity as the growing demand for higher living standard, a limited generation capacity and insufficient transmission infrastructure could not simply meet the sharply rising demand for the electricity in the each grid. Since the peak load/demand is higher than the installed generation capacity, power failure has frequently happened in each mini grid. Although there is much higher demand in commercial and industrial sectors potentially requiring several times higher than the present number, most of such businesses could not depend on the EDC's power supply due to the poor electric quality. (Table 3-4, 3-5, 3-6, Figure. 3-1)

At this moment, most of the commercial and industrial businesses install and use their own captive generators, typically running with diesel or heavy fuel oil (FHO). Because Cambodia depends on highly expensive imported fuel products, the electric price of Cambodia has been among the most critical issues for commercial and industrial sectors.

**Table. 3-4 Number of customers in existing EDC mini grids 2001-2006**

Year	PHN	SRP	SHV	KGC	TKO	BBG	KGT	KPT	Selected State* Total	EDC Total
2001	111.9	8.3	7.0	3.6	2.2	9.6	-	-	142.6	144.9
2002	132.8	8.7	7.3	4.4	2.4	10.2	-	-	165.8	169.1
2003	140.6	9.6	7.8	5.0	2.5	14.1	1.3	-	181.0	184.9
2004	150.7	10.7	8.2	5.1	2.6	15.5	1.6	4.7	199.1	208.5
2005	162.6	12.1	8.2	5.4	2.6	16.3	1.8	-	208.9	217.3
2006	177.2	-	-	-	-	-	-	-	-	263.7

Source: EDC (website in Feb.2009)

(Value in 1,000 customers)

\*Though most of the EDC's grids are not connected at this moment (2008), the selected states could be connected each other in a few years by the ongoing national grid development. PHN: Phnom Penh, SRP: Siam Reap, SHV: Shihanoukville, KGC: Kampong Cham, TKO: Takeo, BBG: Battambang, KGT: Kampong Trach, KPT: Kampot

**Table. 3-5 Consumers by sectors in Phnom Penh 1999-2006**

Consumer	1999	2000	2001	2002	2003	2004	2005	2006
Domestic residence	77,338	86,206	102,575	121,830	128,713	137,657	149,077	-
Commercial	6,464	7,276	7,768	9,355	10,281	11,434	11,849	-
Industrial	483	560	564	617	670	710	725	-
Government	665	672	681	705	671	670	705	-
Rehabilitation	257	344	320	288	256	239	226	-
Internal use	-	21	27	29	20	25	23	-
Total	85,207	95,058	111,908	132,795	140,611	150,726	162,605	177,172

Source: EDC (website in Feb.2009)

**Table. 3-6 Power demand forecast 2000-2012**

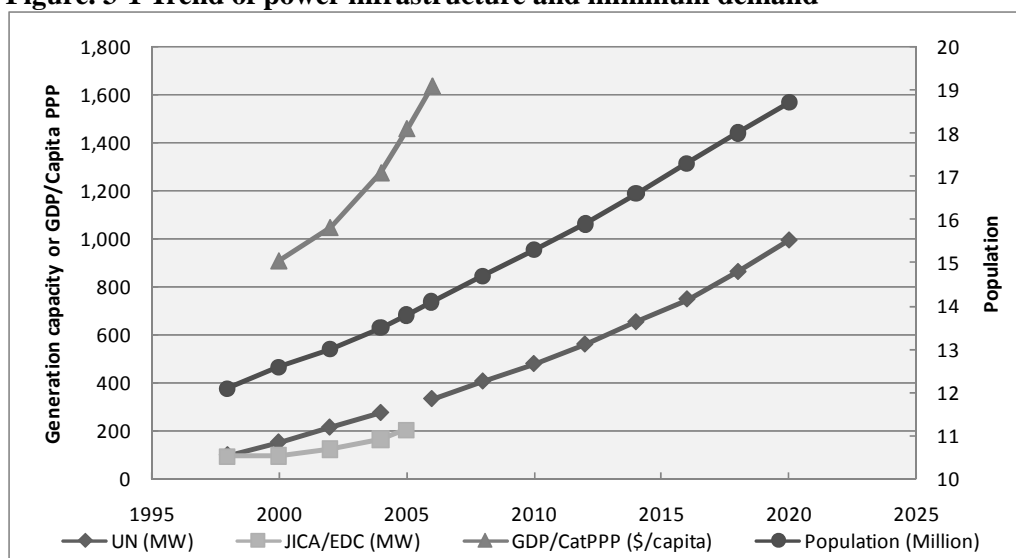
Value in MW	2000	2002	2004	2006	2008	2010	2012
S-E Grid	80	95	191	253	351	439	535
N-W Grid	17	19	24	31	39	49	62
Rest of Grids	53	98	58	61	65	69	73
Total	150	212	273	345	455	557	670

Assumption: Long term growth of 5% GDP, Crude oil price: USD 22 / barrel

Source: ASEAN Energy

([http://www.aseanenergy.org/energy\\_sector/electricity/cambodia/](http://www.aseanenergy.org/energy_sector/electricity/cambodia/))

**Figure. 3-1 Trend of power infrastructure and minimum demand**



Source: United Nations Division for Sustainable Development, EDC/JICA hand book,

In order to meet the consumers' and commercial/industrial demand for the reasonable price and reliable power, the government of Cambodia has been aggressively working on the infrastructure improvement. Due to a lack of funding for the power sector improvement, the government has been working closely with foreign and domestic independent power producers (IPP) to increase the generation capacity not only within the existing EDC grids but also micro grids in the rural communities (MIME1999, Cambodia Power Sector Strategy 1999-2016). The government has been

receiving substantial support from international donor communities including ADB, WB, JICA and others to develop a national grid connecting to major cities and neighboring countries' electric grid for import. (Figure 3-2)

**Extract of Cambodia Power Sector Strategy 1999-2016, MIME(1999)**

**4 - Objectives of the Cambodian Power Sector Strategy**

Cambodia faces a major challenge to develop an adequate and reliable source of electric power in the years ahead. Based on intensive studies of the best means of providing a national electricity supply network, the Royal Government has developed a long-term power sector strategy for Cambodia to meet the growing demand for electric power over the next 20 years. The strategy establishes the sector's policy and action plans for:

- Re-establish an adequate supply of electricity Nationwide through direct support of donors and private participation in generation,
- Strengthen sector managerial and implementing capability,
- Create the environment required for sustained and efficient development of the power sector, open to competition and private participation,
- Extending its power sector objectives to Rural Areas.

**5 - Investment Strategy in the Power Sector**

The huge growth in power supply and infrastructure requirements is not affordable by the Government. Hence the Royal Government has decided to encourage and create the conditions to attract private sector investment in the power industry. The objectives of private sector investment are: (i) to speed-up the rehabilitation of power sector, (ii) to mobilize capital that may not be available from multilateral lending Agencies, (iii) to reduce the public sector debt, (iv) to increase the efficiency of existing power utilities through increased competition and transfer of technology and skill.

The Royal Government will also continue to seek financial assistance from multilateral and bilateral lending Agencies for energy infrastructure development to be undertaken by state- owned corporations. Such borrowings will most likely be for electricity transmission and distribution, hydro-electricity generation, and also provincial and rural electrification.

**3.2 Coal power generation and coal mining license**

**3.2.1 Licenses for power project development**

There is a hierarchical division in Cambodian power sector jurisdiction. The Ministry of Industry, Mine and Energy (MIME) is a policy and planning conductor. Electricity Authority of Cambodia (EAC) is a regulator and licenser for power project. And Electricité du Cambodge (CDC) is a power producer and distributor.

For a new project initiation, firstly, a project investor needs to consult with MIME for the project's initial approval with a consideration of fitting new power generation project in the country's power development plan. Secondly, the investor may need to apply investment license to CDC for claiming preferential tariff and other tax incentives. As those project preparations are completed, the project is at last applied for a license approval through EAC. EAC shall check the project application and consider whether the application should be licensed. There are at present 8 different types of licenses in Cambodia and each one of them has specific incensing procedures in accordance with the provision of Electricity Law.



In this report, detail discussion on each license shall be omitted, however, for license application purpose, Generation License, Transmission License, Distribution License and Consolidated License shall be studied for the proposed power generation and transmission project.

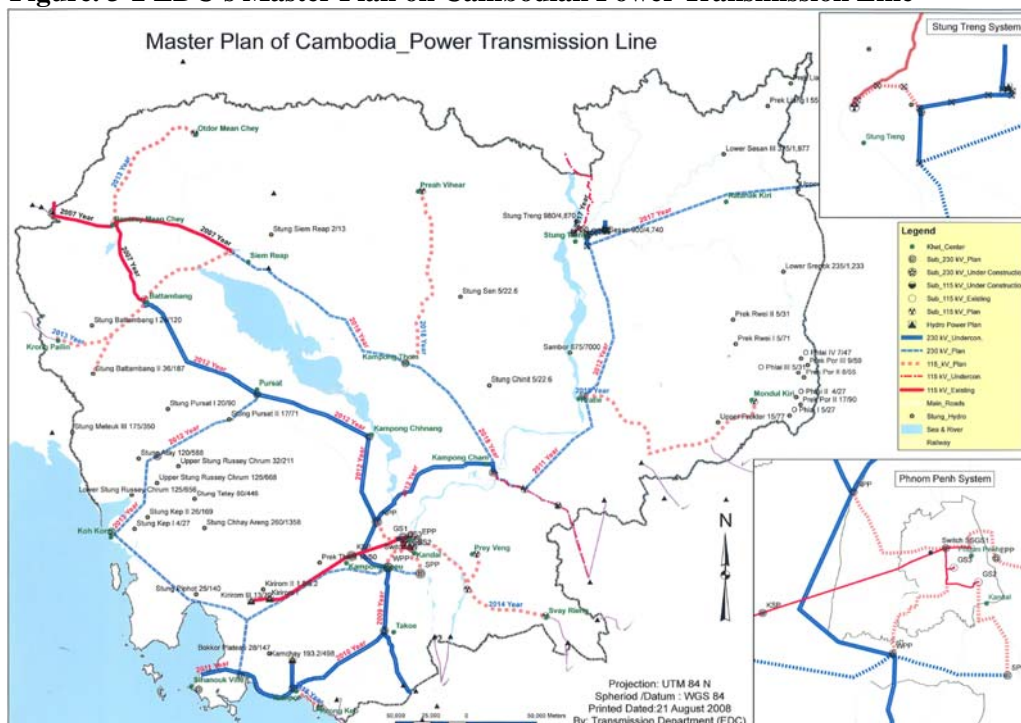
### 3.2.2 Required licenses for coal power project

The proposed project has three components to be considered for licensing, i.e coal excavation, power generation and transmission. As for the coal excavation, mining concession will prevail in the field. For power generation and transmission, if the investor intends to operate both activities, Consolidated License is an appropriate license in which power generation and transmission are comprehensively licensed for its operation. When the two activities are intended to be separately operated, each operation needs to be applied for respective license.

In this respect, the role and characteristics of transmission operation need be highlighted. If EDC intends to operate transmission line with its own facility, the transmission line is under the control of the National Transmission License, which is solely provided for EDC. When the transmission line was integrated with power generation project as an entirely single project, investor should apply for a Special Purpose Transmission License together with Generation license (Generation and Transmission licenses are jointly provided as the Consolidated license).

As the proposed project intends to solely apply for the Generation License, the responsibility for transmit power is up to the substation connecting lines to the transmission line to be developed by EDC and/or other transmission service provider of Cambodia Power Transmission Line as shown in the following figure. (Figure. 3-2)

**Figure. 3-2 EDC's Master Plan on Cambodian Power Transmission Line**



Source: EDC (August 2008)

### 3.2.3 Required licenses for coal mining project

Cambodian mining activities are regulated by the Law on Management and Exploitation of Mineral Resources (2001). In the law, applicants are required to apply for either mineral license or concession with holding mineral exploration license. For concessionaire, the Council for the Development of Cambodia (CDC) is a first focal point to claim for an approval of their industrial mining license. The concession contract allows exploration for two years in which revised two years can be applicable. Under the current law, excavating all mineral resources for export in Cambodia is not permitted unless they are processed to finished products. Hence, crude materials need to cater for domestic industrial use.

However, except the three primary laws on mining, environment and tax, detailed regulations may not be actually effective at this moment. Based on an informal communication with a deputy director of department of mineral resources, MIME, those who are interested in any mining activities in Cambodia need to consult with MIME and “negotiate” the mining conditions. Although there are relevant regulations which determines the mining rights in Cambodia, some of them are still in a reference status. The government has made efforts to improve the laws and regulation in mining sectors, but the reforms on laws and regulation have been slow.

Since the government party, led by prime minister Hun Seng, made major gains at the last election in July 2008, the reform of the mining related laws and regulations would be faster and effective (commented by a MIME officer). In addition, international agencies have been actively supporting the government’s effort to improve the policy and process of mining business sectors in Cambodia. Before the actual implementation of such new regulations, coal mining business development with an existing mining right owner would be a practical option. In case of immediate business development, “Model agreement on metallic minerals exploration and exploitation (2007)” by department of Mineral Resources Development, could be one of the practical and useful references at the negotiation process with the government of Cambodia

**Table. 3-7 Laws and regulations of mines**

LAWS AND REGULATIONS OF MIMES	
1. Laws	
	Law on Mineral Management and Exploitation, promulgated on 13 July 2001
	Law on Environmental Protection and Natural Resources Management, promulgated on 06 December 1997
	Law on Taxation, promulgated on 08 January 1997
2. Regulations	
	Sub-Decree on the Conditions to Issue Industrial Mining License
	Sub-Decree on the Rights and Duties of Assigned Officers to enforce the Law
	Sub-Decree on the Suspension and Revocation of Mineral Licenses
	Prakas on Fees for Registration, Mineral Licenses, Extension, and Rights Transfer
	Prakas on the Registration and Conditions to issue, extend and transfer rights of Mineral Licenses
	Inter-Ministerial Prakas on Surface Rental
	Inter-Ministerial Prakas on Royalties of Metallic and Non-Metallic Minerals

Source: MIME

### **Extract of Law on Mineral Resource Management and Exploitation (2001)**

#### **CHAPTER III: Mineral Resource License Categories**

##### **Article 11:**

Six categories of license shall be made available to applicants in order to facilitate the management of the exploration and exploitation of mineral resources within the Kingdom of Cambodia.

...

6. An Industrial Mining License shall be issued only to the holder of an exploration license for the purpose of conducting exploration and mining of economically viable mineral deposit established within the boundaries of the exploration license. The holder of the exploration license shall submit technical, financial, environmental, social and economic analysis to determine the socio-economic feasibility of proceeding with a mining operation to ask for approval from the Minister in charge of minerals.

A sub-decree will prescribed form and content of such a final feasibility study report and required accompanying documents, and the terms and conditions upon which an industrial mining license shall be issued.

### **Extract of Law on Taxation (1997)**

#### **SECTION 6: WITHHOLDING TAXES AND PREPAYMENT OF TAX ON PROFIT**

##### **ARTICLE 25: GENERAL WITHHOLDING TAX**

The general withholding tax shall be determined as follow:

1. Any resident payor making any payment in cash or in kind to a resident person shall withhold, and pay as tax, an amount according to the below mentioned rates which are applied to the amount paid before withholding the tax:
  - a. The rate of 15 percent on:
    - income received by a physical person from the performance of services including management, consulting, and similar services;
    - royalties for intangibles and interests in minerals, oil or natural gas, and interest paid to a physical person or an enterprise except interest paid to a domestic bank or savings institution.
  - b. The rate of 10 percent on the income from the rental of movable and immovable property.
  - c. The rate of 5 percent on interest paid by a domestic bank or savings institution to a resident physical person having a non-fixed term savings account.
2. The withholding in this article shall not apply to the payment of tax exempt income as stated in article 9 of this law.
3. For purposes of this article and article 26 of this law, the term “resident payor” means:
  - a. any resident enterprise or pass-through;
  - b. any physical person, but only with respect to payments made by such physical person in carrying on a business in the Kingdom of Cambodia.

### **3.3 Scale of power generation project and technical feasibility**

Based on the available information given by the coal mine license owner and some technical information collected in Cambodia and Japan, we concluded a set of 400MW (200MW x 2 units) coal fired power plant is the most suitable option at this moment. Summary of the key factors as follow:

#### Basic information

Net calorific value (CV)	3,000 kcal/kg	3.49 MWh/tonne
Coal reserve (CR)	150,000,000 tonne	

#### Basic Assumption

Total capacity of power plant (CP)	400 MW	400,000 KW
Operating rate (OR)*	80 %/y	
Energy conversion efficiency (CF)	25 %	CF = Gen. Power/CV
Recoverable coal rate (RR)	70 %	
Initial capital cost of power plant	440 Million US\$ (ref. section 4.5)	
Initial capital cost of coal mine	40 Million US\$ (ref. section 4.5)	

\* The operation rate of the power plant is relatively high but we assumed that the proposed power project could be the basic power source of the national grid due to a reliable and economical option for EDC.

#### Necessary Coal Volume and Maximum Operation Time

Power Generation (PG)	2,803,200 MWh/y	$CP(MW) \times OR(\%) \times 365(d) \times 24(h)$
Necessary Coal (NC)	3,214,336 tonne/y	$PG(MWh)/(CV(MWh/t) \times CF(\%))$
Maximum Operation Time	32 years	$CR(t) \times RR(\%) / NC(t/y)$

Due to the availability of cooling water at the mining site and low calorific value of the coal, coal firing at the mining site without coal cleaning is the most economical option for this coal reserve. Based on our preliminary analysis, a larger capacity of power plant might be suitable for this reserve. However, considering uncertainty of the coal variability and the first experience of middle class coal power plant in Cambodia, total capacity of 400MW (200MW x 2 units) will be the most reasonable option.

Since the coal power generation technologies are one of the most matured conventional technologies, the necessary system is commonly available on the market. Most industrial countries are focusing on much larger scale generating system with higher quality coals so that emerging countries' experienced technologies such as Chinese and South Korean systems may be suitable for this project (NEDO: New Energy and Industrial Technology Development Organization, JCOAL: Japan Coal Energy Center).

One of the most critical factors for this project would be the transportation of generating equipment from the generators' production site in overseas to the project site. Because we have not studied this issue in this study, a detailed analysis of logistic technique and cost should be conducted in the next stage. Under the limited information, there would be several options to transport heavy equipment to the mining site as follow:

1. West-East Road approach Thai port > Banteay Meanchey > project site <u>Potential issue:</u> bridge crossing NH6	1) Departing Thai east coast port 2) <Road> Crossing international boarder 3) <NH6> Banteay Meanchey - Siem Reap 4) <secondary road> Siem Reap - project site
2. South-North #1 Road approach Sihanoukville port > Phnom Penh > project site <u>Potential issue:</u> rail way, bridge crossing NH6	1) Departing Sihanoukville port 2) <NH4 or Rail> Sihanoukville-Phnom Penh 3) <NH5 or Rail> Phnom Penh - Battambang 4) <NH6> Banteay Meanchey - Siem Reap 5) <secondary road> Siem Reap - project site
3. South-North #2 Road approach Sihanoukville port > Phnom Penh > project site <u>Potential issue:</u> rail way, bridge crossing NH6	1) Departing Sihanoukville port 2) <NH4 or Rail> Sihanoukville-Phnom Penh 3) <NH6 > Phnom Penh - Siem Reap 4) <secondary road> Siem Reap - project site
4. South-North #3 Barge approach Sihanoukville port > Phnom Penh > project site <u>Potential issue:</u> rail way	1) Departing Sihanoukville port 2) <NH4 or Rail> Sihanoukville-Phnom Penh 3) <Tonle Sap> Phnom Penh - Siem Reap 4) <secondary road> Siem Reap - project site
5. East-West Barge approach Vietnam port > Phnom Penh > Seam Reap > project site <u>Potential issue:</u>	1) Departing Vietnam south coast port 2) <Mekong> Crossing international boarder 3) <Tonle Sap> Phnom Penh - Siem Reap 4) <secondary road> Siem Reap - project site

Considering the transshipment cost and time as well as uncertainty of the road and bridge condition, option 5 of barge approach from Vietnam seems the most economical option. In addition to the major road transport, the secondary road transport from Siem Reap to the project site will be another critical factor to be considered. Based on the law on land traffic (2006), the maximum total weight of truck and heavy equipment should be less than 40 tons with the permission by the Ministry of Public Works and Transport. Based on our field investigation, the secondary road condition, except small bridges, between Siem Reap and the project site would be strong enough to support such heavy vehicles. Detailed consideration shall be done by transportation specialists in the next stage.

#### **Extract of Law on Land Traffic (2006)**

##### **ARTICLE 54:**

Carrying goods on vehicle shall not exceed maximum weight of the sustaining axles and shall not exceed the limited by the company producing the vehicles and shall not be over permitted weigh as follow:

...

3. Limitation of permitted maximum total weight of automobile with trailers shall be defined as follow:

- 40 tons for automobile with trailers having five axles onward.

4. Limitation of permitted maximum weight of automobile with semi-trailers shall be defined as below:

- 40 tons for automobile with semi-trailers having five axles onward. The total weighs of the automobile and the trailers or semi-trailers which is not included in points above shall be asked for permission letter from Ministry of Public Works and Transport. When crossing the bridges, all drivers of automobiles,

automobile with trailers, or semitrailers shall obey the permitted-maximum-weight signs put in front of the bridges. The size of automobiles, automobiles with trailers or semi-trailers with no loading shall be defined as below:

- Maximum width of the vehicles shall not exceed 2.5 meters except vehicles equipped with tools should not be more than 3 meter width
  - Maximum height should not be higher than 4.2 meters
  - Maximum length of each automobile shall not exceed 12.2 meters
  - Maximum length of the automobiles towing semi-trailers shall not exceed 16 meters
  - Maximum length of the automobiles towing trailers shall not exceed 18 meters
- Technical standard of size and weight of other types of vehicles shall be defined by Prakas of Ministry of Public Works and Transport.

### 3.4 Environmental impact consideration

Importance of environmental impact assessment has been increasingly vital in recent years. Recently, many large scale projects such as mineral mining and large power generation projects have actually been suspended due to a lack of serious care at the initial stages. Due to the sensitive period to gather relevant information widely, we have consulted with two Environmental Impact Assessment (EIA) consulting firms, which are certified by EIA office of Ministry of Environment (MOE), to gather preliminary requirements and consideration for the proposed project. Based on our initial assessment at the coal mine sites and consultation with the certified environmental consultation firms, there are few critical factors such as endangered species, archeological sites, and massive residential resettlements for this project at this moment.

Under the current law in Cambodia, certain scale of any activity that may or may not impact on present environment in Cambodia is required to meet the “Law on Environmental Protection and Natural Resource Management” and other relevant laws and regulations. The Cambodian environmental law is an overall policy of adequate natural resource protection and management. Detailed requirements for “1)Environmental impact assessment (EIA), 2)Solid waste management, 3)Water pollution control, 4)Control of Air Pollution and Noise Disturbance” are separately defined by each sub-decree. Implementation of each regulatory sub-decree was assisted by international aid agencies so that the standards of those sub-decrees are as same as the industrial countries’ environmental regulations.

#### **Extract of Law on Environmental Protection and Natural Resource Management**

Article 1-

The purposes of law are:

- To protect and promote environmental quality and public health through the prevention, reduction, and control of pollution.
- To assess the environmental impacts of all proposed projects prior to the issuance of the decision by the Royal Government.
- To ensure the rational and sustainable conservation, development, management, and use of the natural resources of the Kingdom of Cambodia.
- To encourage and enable the public to participate in environmental protection and natural resource management.
- To suppress any acts that cause harm to the environment.



By the sub-decree on environmental impact assessment process, any scale coal mining and equal and larger than 5MW power plants are required to conduct initial environmental impact assessment (IEIA) or full scale environmental impact assessment (EIA) (Annex of sub-decree on environmental impact assessment process). Considering the further project feasibility analysis, a full scale EIA is recommended to avoid unnecessary adverse impacts on the project community and critical conflicts with surface land owners/users. All of large scale development projects are required to conduct IEIA, but both coal mine and coal power projects are likely to require full scale EIA after the submission of IEIA or at the beginning. (certified EIA consulting firms: EIA CF) Based on the EIA firms' experience, the full EIA may take at least six months to complete the field investigation and reporting. Though the scale and impacts of each project are significant, an integrated full scale EIA may cover both coal mine and coal fired power projects due to the common area of concerns. The integrated EIA may greatly be able to reduce the EIA related costs and efforts.

#### **References of environmental policies**

Law on Environmental Protection and Natural Resource Management

<http://www.camnet.com.kh/moe/EnvironmentLow.htm>

Sub-decree on Solid Waste Management

[http://www.camnet.com.kh/moe/sub-decree\\_SWM\\_English.htm](http://www.camnet.com.kh/moe/sub-decree_SWM_English.htm)

Sub-decree on Water Pollution Control

[http://www.camnet.com.kh/moe/sub-decree\\_English.htm](http://www.camnet.com.kh/moe/sub-decree_English.htm)

Sub-decree on Environmental Impact Assessment

[http://www.camnet.com.kh/moe/sub\\_EIA.htm](http://www.camnet.com.kh/moe/sub_EIA.htm)

ANUKRET on The Control of Air Pollution and Noise Disturbance

<http://faolex.fao.org/docs/texts/cam49034.doc>

Declaration on Management and Elimination of Forest Anarchy

<http://www.camnet.com.kh/moe/vinarin.htm>

Followings are some of the key components to be concerned:

#### **Water**

The proposed project contentiously needs substantial water for steam cooling water in the power plant. In case of coal cleaning processing before firing, it also requires substantial water annually. Though there are substantial water reserves around the project site, the proposed project is likely to require a new water reservoir in order to avoid unnecessary competition between drinking water supply and industrial usage. The security of the drinking water is the primary consideration in EIA (EIA CF).

Implementation of whether coal mining or power generating activities need to comply with "Sub-decree on water pollution control." The purpose of the sub-decree stands for ensuring the protection of human health and the conservation of bio-diversity. In case of coal cleaning processing, appropriate effluent treatment is required before discharging the coal cleaning water in the surrounding environment.

#### **Coal ash filling - Waste management**

Due to the low quality coal, the coal power plant contentiously needs to deal with

substantial amount of coal ash till the closure of the power plant. Fortunately, the open cast mining site/empty coal reserve will be effectively converted into land filling site for the coal ash. In case of water soluble toxic substance in the coal ash, drainage treatment or isolation of the drain water from the drinking water is required to meet the “Sub-decree on solid waste management.”

#### Air pollution and noise

As similar standards as other developed countries, the coal mining and coal power generation activities need to meet “Anukret on the Control of Air Pollution and Noise Disturbance.” Though coal fired power generation is the most economical option Applying fossil fuel, it is also the most expensive option to clean the coal exhaust. Due to the strong demand on the market, such applied technologies are economically available at this moment. In order to avoid environmental impacts and potential conflicts with residents and environmental organizations, appropriate facilities equipped with sufficient cleaning/detoxifying technologies. Sulfur oxide and nitro oxide gases are two representative air pollutants from coal emission. Due to the higher standards of air pollutant control in Japan, U.S., and EU, applicable economical technologies are available at most of experienced engineering companies in such countries as well as some engineering companies in emerging countries such as China and South Korea. Based on the annex 8 of the sub-decree, the permitted sulfur (S) content of coal for combustion is up to 1.5%. (ref. Annex 1, 2, 3, and 8 of Anukret on the Control of Air Pollution and Noise Disturbance)

Appropriate noise control is also seriously considered not only for the residence around the project site but also workers in mining and power generation facilities. The Anukret regulates the specific limitation of noise in the environment. In case of the excess of the regulated level, the project/employer(s) shall provide necessary abatement measure to minimize the adverse effects from the noise. (ref. Annex 6 and 7 of Anukret on the Control of Air Pollution and Noise Disturbance)

#### Dereliction of Land

Based on the available boring logs for the proposed mining project, the open cast mining is applicable for the identified reserves. As a result of physical removal of the surface soil, reasonable management plans for the environmental impacts need to be considered. As stated in the above coal ash management section, the mining site will be recovered by coal ash and ground after the coal recovery.

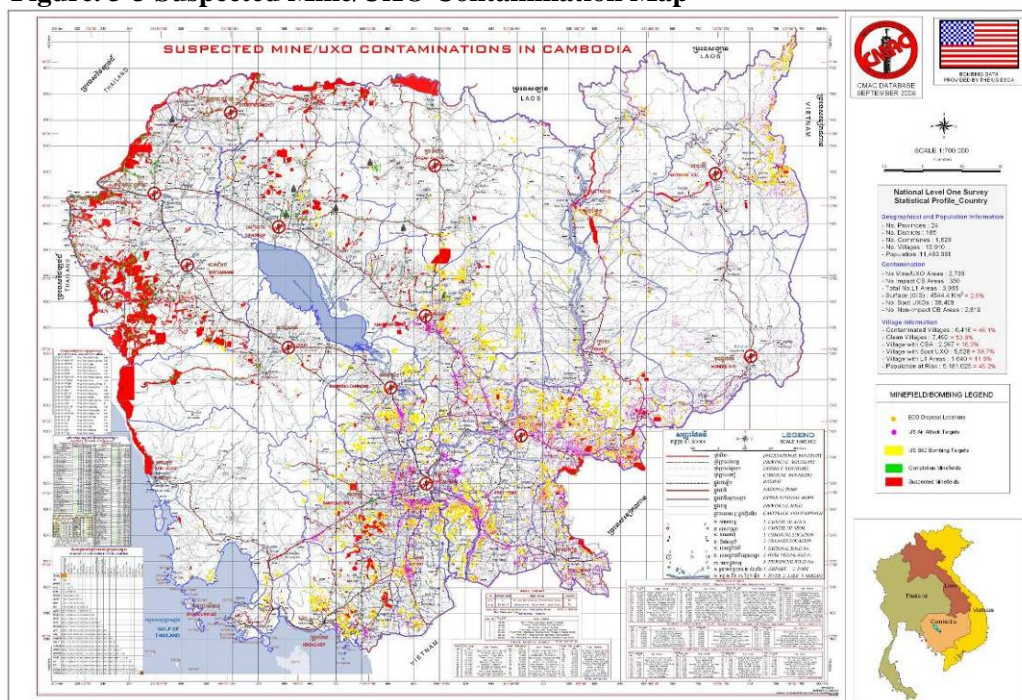
The proposed mining site is mostly located at the abandoned grass land where there used to be active logging. There are scattered residences in or around the potential mining site so that appropriate resettlement plans shall be considered in the early stages.

In addition, the consideration of temporal deforestation shall be considered. Though there are not many timbers left in the mining site, cutting and treatment of the existing trees need to be addressed. Under the effective law on forestry, any commercial logging is prohibited. The proposed coal mining and power project will refill the ground after the mining and provide agricultural land as well as reforestation land. The project owner/implementer needs to communicate with Ministry of Agriculture for timber treatment, agricultural land development and reforestation as well as Ministry of Interior for rural community development.

### Ground Mine and Unexploded ordnance (UXO)

Consideration of unexploded ordnance should be carefully addressed for the proposed project. Based on the consultation with Cambodia Mine Action Center (CMAC), a responsible authority to deal with ground mine and UXOs in Cambodia, the potential mining site is likely to be contaminated by ground mines. CMAC has conducted initial investigation around the area and actively conducted cleaning operation in the region. CMAC is seeking for private partners to support their activities for private's interests and CMAC's cleaning objectives. Mutual collaboration with CMAC's operation and mining operators' land clearance enables land cleaning efficiently and is able to return safe land faster.

**Figure. 3-3 Suspected Mine/UXO Contamination Map**



Source: CMAC

## 3.5

### **Project cost estimation**

## 3.5.1

### **Capital cost estimate of the power generating project**

The total capital cost of the power generating project consists of the construction cost of the proposed coal-fired power plant and the transmission lines between the power generating plant and the local grid.

#### (1) Construction cost of the power generating project

In calculating the construction cost of the proposed coal-fired power plant, we have estimated the unit cost at US\$1,100 per KW, roughly 20% less expensive than the construction cost of \$1,290 /kW estimated by US Energy Information Administration as the capital cost for the coal-fired plant in the U.S. Due to the recent sharp depressed economic condition, the coal fired plant facilities are likely to be a buyer's market for next few years when the proposed plant would be installed. We assumed that fully inclusive delivery cost of a coal fired power plant in Cambodia is US\$1,100/KW. A rationale for estimating the construction cost of a power generating plant at \$1,100 per kW is the fact that the project will be able to substantially benefit

from Cambodia's much cheaper labor cost than in the U.S. and from low procurement prices of the project equipment due to the globally depressed economic condition. The geographical disadvantage of the project site is thought to be negligible. Based on the above unit cost, the construction cost of the 400MW power generating plant is estimated at \$440 million. The construction cost excludes the interest that may accrue if any during construction.

(2) Total capital cost of the power generation

We are expected to collaborate with EDC's high voltage transmission line and sub station connected to the proposed power plant. Thus, the cost of the transmission line between the power plant and the closest EDC grid in Seam Reap is not included. Consequently, the total cost of the power generating project is estimated at \$440 million.

**3.5.2 Operating cost of the power generating project**

The operating cost of the power generating project consists of the labor cost, repairs and maintenance cost, the coal purchase cost and the ash treatment cost.

(1) Repairs and maintenance cost of the power generating plant

In calculating the operating cost of the coal-fired power plant, we have assumed that a 1% linear relationship exists between the repairs and maintenance cost and the capital cost. This estimation relies on two references, "EIA-Assumptions to the Annual Energy Outlook 2008" and "Project Performance Audit Report on North Madras Thermal Power Project in India" prepared by ADB. ADB's project performance audit report describes that the O&M cost is in a 1 % linear relationship with the capital cost. On the other hand Table 38 on page 79 of EIA's Annual Energy Outlook 2008 shows \$26.79/kW of fixed O&M cost as against \$1,534/kWh of capital cost, which indicates a 1.7% linear relationship. Our experiences show that the operation and maintenance cost stood at 3% of the capital cost in case of a deep open mining project in Africa, which required a huge operation and maintenance cost. Considering the shallow open mining method to be required for the project and the current depressed economic condition, much of the repairs and maintenance cost may be able to be saved due mainly to the advantageous situation. We consider therefore the 1% linear relationship realistic. Based on the above 1% linear relationship, the repairs and maintenance cost is calculated as follow:

O&M cost = \$1,100/kW×1% = \$11 /kW (the rationale for this calculation as given below)

In the case of 400MW generating capacity, O&M cost will be some \$4.4 million (\$11/kW×400,000kW).

(2) Coal purchase cost

Based on the power generating efficiency rate and the net calorific value of the coal to be produced by the mining project (see the assumptions (e) and (f) given below), the annual purchase volume of coal will be some 2.7 million tons (i.e.  $2,803,200\text{MWh}/(4.07\text{MWh/ton} \times 0.25\%) = 2,755,145 \text{ tons}$ ) in order to achieve the planned annual power generation.

(3) Ash treatment cost

As for the ash treatment cost, we consider it negligible because ash slurry can be

dumped in nearby ponds and will settle down easily, causing no harmful damage to the surface soil for agriculture. Another reason for the above is that the ash produced by the power plant may be used by cement plants as a material to manufacture cement. Therefore the ash treatment cost is not included in the operation and maintenance cost.

### **3.5.3 Capital cost estimate of the open cast coal mining project**

The total capital cost of the coal open mining project consists of the preparation cost for open mining and equipment cost. The estimated construction cost greatly depends on the mining site condition. However, we could not collect such specific information at this moment so that we have consulted with an experienced mining specialist presently supporting the coal mine license holder. With the specialist's experience in Africa and Vietnam and available information, we have estimated the total capital cost to be \$40 million at a maximum, considering the shallow structure of coal seams in the mining site and the current depressed global economic condition.

### **3.5.4 Operation and maintenance cost estimate of the coal open mining project**

As same consideration as above coal mine investment estimation, we have estimated the operation and maintenance cost at \$25/ton, including tax, royalties and equipment lease fees with limited information and our experience.

## **3.6 Power supply for grid**

### **3.6.1 On-Going and Future Transmission Line Projects (2009-2020)**

Transmission line system in Cambodia is under-developed until now and existing transmission line systems are still limited to around Phnom Penh area. A few transmission line projects near the border area of Thailand and Vietnam are on-going at this moment.

On-going project:

Stage 1 (5 years: 2004-2009)

The scope of work includes implementation of the following projects:

- 2007: Single line interconnection 115 kV from Thailand to Banteay Meanchay, Battambang and Siem Reap terminals completed by the private investment.
- 2007: Interconnection 220 kV double circuit from Vietnam to Phnom Penh substation 220/115/22 kV (WPP) including substation 115/22 kV at East Phnom Penh (EPP) this project will be inaugurated in 2009.
- 2007: Establishment of 115/22 kV terminal substation at Phnom Penh (NPP) and stringing a second a 115 kV transmission circuit between GS1 and NPP. This project is completed in 2008.
- 2008: Establishment of Takeo to Kampot 230 kV transmission line including substation 230/22 kV in Kampot, Germany grant/loan aid. This project is currently implemented and likely to complete within 2009.

Stage 2 (5 year 2009 - 2013)

The scope of work for the Stage 2 includes implementation of the following projects:

- 2009: 120 km single circuit 230 kV transmission line from Phnom Penh (WPP) to Kampong Cham including a substation 115/22 kV at Kampong Cham,
- 2010: Transmission line 260 km double circuit 230 kV between Phnom Penh (WPP) and Battambang via Kampong Chhnang and Pursat including substations in Kampong Chhnang and Pursat,
- 2011: Transmission line 230 kV from Sihanoukville to Phnom Penh (WPP) along

- National road 4,
- 2012: 122 km single circuit 115 kV transmission line from Phnom Penh to Svay Rieng via Neak Loeung including terminal substations at Neak Loeung and Svay Rieng,
- 2013: Transmission line 230 kV From Kampot to Sihanoukville.

Stage 3 (5 years 2014 - 2018)

The scope of work includes implementation of the following projects:

- 2016: Double circuit 230 kV transmission line linking Stung Atay hydropower plant to Pursat substation,
- 2018: Connection of 230 kV line from Kampong Cham substation to Sambor hydropower plant,
- 2018: Transmission line 230 kV linking Kampong Cham to Siem Reap via Kompong Thom,
- 2020: Transmission line 500 kV linking Sambor, Stung Treng, Lower Se San 2 and Lower Srepok 2 and connect to ASEAN grid (power exchange between Cambodia – Vietnam, Thailand and Laos).

### **3.6.2 Interconnection with neighboring countries**

The Interconnection Master Plan in the field of energy for electricity and natural gas will be established through the ASEAN Power Grid (APG) and the TAGP cross-border projects by developing efficient power supply market, to facilitate economic generation and transmission of electricity, enhance security of power system and provide opportunities to private investment for future energy trading among ASEAN member countries.

The power interconnection offers several benefits compared to isolated systems for each country, but will imply investments in cross-border transmission lines and substations, and the national transmission systems may have to be reinforced. Strong interconnections between power systems reduce the total need for operating reserves because of the opportunity to share reserves between countries. This reduces operating costs, but also reduces to some degree the need for installed peaking capacity. Hence, it will reduce the environmental impact. Strong interconnected power systems have high reliability resulting in low levels of energy not served.

Most of the power plants, hydropower as well as thermal, assumed implemented for domestic supply and for export are located in the south-western and north-eastern part and along the coastal areas of the country. These power plants will be connected to the national grid interconnecting Thailand, Cambodia, Vietnam and Lao systems. In the near term, the power supply will be based on power import from Vietnam to Phnom Penh and from Thailand to North-Western Cambodia: Banteay Meanchey, Battambang and Siem Reap provinces.

### **3.6.3 Prospect of the Proposed Integrated Coal Mine and Power Plant Plus Proposed Transmission**

The key transmission line around the proposed coal mine and power plant site are already planned and to be implemented from 2010 as described below (ref. Figure 3.1):

2010: Transmission line 260 km double circuit 230 kV between Phnom Penh (WPP) and Battambang via Kampong Chhnang and Pursat including substations in Kampong

Chhnang and Pursat. Therefore, only 100 Km of additional transmission line from Siem Reap to the Coal power plant site will be needed.

The proposed integrated coal mine and power plant is not included in the Power and Transmission Line Master Plan yet due to discovery of coal mine was just less than one year. Based on discussions with EDC and MIME, the proposed coal power plant is welcomed by both EDC and MIME since Cambodia will benefit greatly by the coal power plant. In order to implement the proposed power plant (400 MW), about 100 Km of 230 KV transmission line project will be needed between Siem Reap and the coal power plant site.

The construction cost of the power generating project includes the construction cost of the transmission lines linked with the local grid. The construction cost consists of those of transmission lines and two substations. The unit cost of a transmission line for a high voltage of between 35kv and 230kv is estimated at between \$250,000/km and \$300,000/km, including single-conductors, towers and other equipment. Our experiences show that it is reasonable to assume that a transmission line for a 400MW power generating plant requires a single- conductor system. We estimate the unit cost of the transmission line to be close to \$250,000/km, given that ADB's ongoing transmission lines project from Vietnam to Phnom Penh adopts a high voltage system of 230kv, and considering the current depressed international machinery prices. With these factors taken into account, and assuming the transmission line of 100km, we estimate that the construction cost of the transmission lines will amount to \$51,000 thousand, namely, \$250,000/km×100km plus \$13,000 thousand/unit×2 units.

### 3.7 Financial analysis

#### 3.7.1 Scenario analysis

In order to examine the feasibility of integrated coal mining and coal power plant project, we focused on the coal pricing and then analyzed the reasonability of coal pricing and attributed power sales pricing for the proposed project. Consequently, we have contemplated several scenarios on the combinations of coal sale prices between the coal mining project and the power generating project, and sale prices of electricity between the power generating project and EDC.

Six scenarios are examined for the coal mining project, and several scenarios are examined for the power generating project, corresponding to each scenario of the coal mining project as shown below.

**Table. 3-8 Summary of Scenario Analysis**

Coal-fired Power Plant Scenario	Power sales price (US\$/kwh)	Coal trading price (US\$/t)	Coal Mining Scenario
CPP-1-1	0.07	28	CM-1
CPP-1-2	0.08		
CPP-1-3	0.09		
CPP-2-1	0.07	30	CM-2
CPP-2-2	0.08		
CPP-2-3	0.09		
CPP-3-1	0.07	30.42 Break even point	CM-3
CPP-3-2	0.08		
CPP-3-3	0.09		

CPP-4-1	0.07	32	CM-4
CPP-4-2	0.08		
CPP-4-3	0.09		
CPP-5-1	0.07	34	CM-5
CPP-5-2	0.08		
CPP-5-3	0.09		
CPP-6-1	0.07	36	CM-6
CPP-6-2	0.08		
CPP-6-3	0.09		
CPP-6-4	0.10		

### 3.7.2 Cash-flow projections and financial internal rate of return (FIRR) for each project

#### (1) Assumption of the FIRR

Cash-flow projections are prepared for each scenario based on the following assumptions:

(a) Generating capacity:	400 MW
(b) Annual operating rate:	80 %
(c) Sales price of electricity:	Several scenarios between 0.07 US\$/kWh and 0.10 US\$/kWh are assumed. The sales price should be determined in such a way that EDC will be able to earn a profit out of the electricity purchase from the power generating project (hereinafter referred to the project). Given that EDC's average tariff per KWh for year 2005 was KHR599, which is about 0.15 US\$/kWh based on the current foreign exchange rate, the above scenarios between 0.07 US\$/KW and 0.10 US\$/KW are thought to be realistic, although it is subject to negotiation with EDC.
(d) Planned annual power generation (assumed to be constant from year 3):	$400\text{MW}/\text{hour} \times 24\text{hours} \times 365\text{days} \times 0.8 = 2,803,200 \text{ MWh}$
(e) Net calorific value of coal:	3,000 kcal/kg or 3.488 MWh/ ton
(f) Power generating efficiency rate:	25%
(g) Annual purchase amount of coal to achieve the planned annual power generation:	$(d)/(e) \times (f) = 2,803,200\text{MWh} / (3.488\text{MWh}/\text{ton} \times 0.25) = 3,214,336 \text{ ton /y}$
(h) Purchase price of coal:	Six scenarios of 28, 30, 30.42 (break even), 32, 34, 36US\$/t are examined.
(i) Depreciation method:	All capital costs of the integrated coal mining and power generation project will be depreciated linearly over 20 years in accordance with the Cambodian taxation law. A seven year depreciation method, which requires a new legislation, will improve the present value of the project by saving the project's income taxes. Therefore, the possibility of adopting the seven year depreciation method needs to be pursued. However the tax saving effects should not affect the intrinsic value of the project, i.e. FIRR so that the depreciation period does not need to be considered in the calculation of the FIRR.
(j) Distribution/transmission loss:	The distribution loss is estimated at 5% of the generated amount of electricity throughout the life of the project. This estimation is based on the average distribution loss rate of 11.1% in PHN, and SRP and SHV provinces for year 2005 published by EDC. Using this average loss rate, and taking into account the



downward trends of the loss rates in PHN, and SRP and SHV between years 2001 and 2005, we consider the 10% to be on the safe side. However, the project will be only responsible for the transmission up to the EDC's substation next to the power plant. Due to the very short transmission with high voltage transmission between the power plant and EDC's substation, we assumed that the maximum loss would be up to 5% with conservative assumption.

Table. 3-9 Transmission loss in EDC mini grids

Year	PHN* <sup>1</sup>	SRP* <sup>2</sup>	SHV* <sup>3</sup>
2001	14.7%	15.7%	13.5%
2002	13.1%	20.1%	15.4%
2003	12.7%	16.2%	12.5%
2004	13.1%	13.6%	11.1%
2005	11.4%	10.2%	11.7%

\*<sup>1</sup> Phnom Penh    \*<sup>2</sup> Siem Reap    \*<sup>3</sup> Sihanoukville

Source: EDC Website

- (k) All project costs are assumed to be financed by equity to calculate the intrinsic value of the project because the intrinsic value of the project should theoretically be independent of the way that the project is financed.

## (2) Selected cash-flow projection

Each project scenario summarized in Table 3-8 is examined by the cash flow analysis. For the marketability of the actual coal market and most likely power sales pricing, we set representative coal trading price as US\$32/t and power sales price as US\$0.1/KWh.

Considering the long term loan condition in Cambodia, it is hardly to find a bank to provide such scale of funding and more than 10years loan. Thus, we assumed offshore public/private funding with complete repayment within 10 years with two years of grace period for 5% annual interest. For the operation capital we assumed 3% interest (2% lower than long term loan) due to rotating/revolving short term loan condition. We assumed that the required operation cost for each project competent is two months of each project's sales income, i.e. coal sales for coal mining and power sales for coal plant project.

Because the cash flow of each project component is identical after the complete repayment by project year 10 for the power project and 9 for the coal mine project, the representative cash flow of each coal fired power plant and coal mining are extracted between project year 1 - 10 and 1-11 respectively.

**Table. 3-10 Cash-flow projections for the coal-fired power project (unit: US million)**

Project year	1	2	3	4	5	6	7	8	9	10	11
<b>Cost</b>	<b>198</b>	<b>198</b>	<b>44</b>	<b>173</b>	<b>171</b>	<b>168</b>	<b>166</b>	<b>163</b>	<b>161</b>	<b>137</b>	<b>107</b>
CPP Initial Investment	198	198	44								
CPP O&M	0	0	0	4	4	4	4	4	4	4	4
Coal Purchase	0	0	0	103	103	103	103	103	103	103	103
Loan Repayment	0	0	0	50	50	50	50	50	50	29	0
Interest Payment	0	0	0	16	14	11	9	6	4	1	0
Short term loan interest	0	0	0	0	0	0	0	0	0	0	0
<b>Benefit</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>
Power Sales	0	0	0	280	280	280	280	280	280	280	280
<b>Net Balance</b>	<b>-198</b>	<b>-198</b>	<b>-44</b>	<b>107</b>	<b>109</b>	<b>112</b>	<b>114</b>	<b>117</b>	<b>119</b>	<b>143</b>	<b>173</b>

Source: Study team

**Table. 3-11 Cash-flow projections for the coal-fired power project (unit: US million)**

Project year	1	2	3	4	5	6	7	8	9	10
<b>Cost</b>	<b>36.0</b>	<b>2.0</b>	<b>15.5</b>	<b>87.8</b>	<b>86.4</b>	<b>86.4</b>	<b>86.4</b>	<b>86.4</b>	<b>85.6</b>	<b>80.4</b>
CM Initial Investment	36.0	2.0	2.0							
CM O&M	0.0	0.0	13.4	80.4	80.4	80.4	80.4	80.4	80.4	80.4
Loan Repayment	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.3	0.0
Interest Payment	0.0	0.0	0.0	2.0	1.0	1.0	1.0	1.0	0.0	0.0
Short term loan interest	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
<b>Benefit</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>103</b>	<b>103</b>	<b>103</b>	<b>103</b>	<b>103</b>	<b>103</b>	<b>103</b>
Coal Sales	0	0	0	103	103	103	103	103	103	103
<b>Net Balance</b>	<b>-36.0</b>	<b>-2.0</b>	<b>-15.5</b>	<b>15.1</b>	<b>16.5</b>	<b>16.5</b>	<b>16.5</b>	<b>16.5</b>	<b>17.2</b>	<b>22.5</b>

Source: Study team

### (3) Financial internal rate of return of the power generating project

Given the current financial market condition, a financial internal rate of return (FIRR) above 10% seems to be reasonable enough to make the project feasible. However, considering country risk and past practices in Cambodia, a FIRR above 15% may be required to convince potential investors for proposed projects. From this viewpoint, the power generating project will be able to achieve satisfactory results when the power sales price is above 0.08US\$/kWh (Table 3-12), whereas, it is to be noted that the following scenarios are based on the assumption, which virtually acceptable wholesale price of electricity to EDC would be up to \$0.10/KWh.

**Table. 3-12 Summary of FIRR for the Coal-Fired Power Project**

Scenario	Coal purchase price (US\$/t)	Power sales price (US\$/kwh)	FIRR (%)
CPP-1-1	28	0.07	11.6
CPP-1-2		0.08	15.9
<b>CPP-1-3</b>		<b>0.09</b>	<b>19.7</b>
CPP-2-1	30	0.07	10.6
CPP-2-2		0.08	14.9
<b>CPP-2-3</b>		<b>0.09</b>	<b>18.9</b>
CPP-3-1	30.42 Break even point	0.07	10.4
CPP-3-2		0.08	14.7
<b>CPP-3-3</b>		<b>0.09</b>	<b>18.7</b>
CPP-4-1	32	0.07	9.5
CPP-4-2		0.08	14.0
<b>CPP-4-3</b>		<b>0.09</b>	<b>18.0</b>
CPP-5-1	34	0.07	8.4
CPP-5-2		0.08	13.0
<b>CPP-5-3</b>		<b>0.09</b>	<b>17.1</b>
CPP-6-1	36	0.07	7.3
CPP-6-2		0.08	12.0
<b>CPP-6-3</b>		<b>0.09</b>	<b>16.2</b>
CPP-6-4		0.10	20.0

Source: Study team

**Table. 3-13 Sensitivity analysis of coal power project's FIRR**

FIRR (%) for		Power Sales (US\$/kwh) @coal 32US\$/t							
		0.06	0.07	0.08	0.09	0.10	0.11	0.12	
Cost: Initial investment 440 Annual O&M 73	23ye Million US\$	130%	N/A	0.5%	5.2%	9.2%	12.7%	15.9%	18.9%
		125%	-0.8%	2.0%	6.6%	10.5%	14.0%	17.2%	20.3%
		120%	0.8%	3.4%	7.9%	11.8%	15.4%	18.6%	21.7%
		115%	2.3%	4.9%	9.3%	13.2%	16.8%	20.1%	23.2%
		110%	3.9%	6.4%	10.8%	14.7%	18.3%	21.7%	24.9%
		105%	5.4%	7.9%	12.3%	16.3%	20.0%	23.4%	26.6%
		100%	7.1%	9.5%	14.0%	18.0%	21.7%	25.2%	28.5%
		95%	8.8%	11.2%	15.7%	19.8%	23.6%	27.1%	30.5%
		90%	10.6%	13.0%	17.6%	21.7%	25.6%	29.2%	32.6%
		85%	12.5%	15.0%	19.6%	23.8%	27.7%	31.4%	34.9%
		80%	14.5%	17.0%	21.7%	26.0%	30.1%	33.9%	37.5%
		75%	16.7%	19.3%	24.1%	28.5%	32.6%	36.5%	40.2%
		70%	19.1%	21.7%	26.6%	31.2%	35.4%	39.4%	43.2%

Source: Study team

#### (4) Financial internal rate of return of the coal mining project

As similar logical analysis as coal power project, we consider an FIRR of the project above 15% satisfactory. In the case of coal mining project, all scenarios above \$30/t can be satisfactory.

**Table. 3-14 Summary of FIRR for the Coal-Fired Power Project**

Scenario	Coal sales price (US\$/t)	FIRR (%)
CM-1	28	9.0
CM-2	30	17.2
CM-3	30.42 Break even point	18.7
CM-4	32	24.0
CM-5	34	30.1
CM-6	36	35.5

Source: Study team

**Table. 3-15 Sensitivity analysis of coal mine's FIRR**

FIRR (%) for		Coal Sales (US\$/ton)						
		26	28	30	32	34	36	38
Cost: Initial investment 40 Million US\$ Annual O&M 80 Million US\$/y	23year 130%	N/A	N/A	N/A	N/A	-1.9%	7.5%	14.2%
	125%	N/A	N/A	N/A	N/A	4.9%	12.5%	18.6%
	120%	N/A	N/A	N/A	1.8%	10.5%	17.2%	23.0%
	115%	N/A	N/A	N/A	8.2%	15.5%	21.8%	27.3%
	110%	N/A	N/A	5.3%	13.7%	20.4%	26.3%	31.6%
	105%	N/A	1.8%	11.5%	18.9%	25.2%	30.9%	36.0%
	100%	N/A	9.0%	17.2%	24.0%	30.1%	35.5%	40.5%
	95%	5.9%	15.2%	22.7%	29.2%	35.0%	40.2%	45.1%
	90%	12.9%	21.1%	28.1%	34.3%	39.9%	45.1%	49.8%
	85%	19.3%	27.0%	33.6%	39.6%	45.1%	50.1%	54.7%
	80%	25.6%	32.8%	39.3%	45.1%	50.4%	55.3%	59.8%
	75%	31.9%	38.9%	45.1%	50.7%	55.9%	60.7%	65.2%
	70%	38.4%	45.1%	51.1%	56.6%	61.7%	66.4%	70.8%

Source: Study team

#### (5) Recommendation on the most feasible scenarios

As the benchmark long-term interest rates are historically low now and will continue to be so for a few years to come in the global financial market, we consider a FIRR of the project above 15% satisfactory under the present Cambodian circumstance. Considering the reasonable scenarios for the coal power project, power sales price above US\$ 0.09/kWh of coal power project may be consequently proposed and most likely to be accepted by both investors and EDC as long as a satisfactory financing scheme can be worked out to avoid or alleviate the Cambodia's country risk.

Considering the reasonable scenarios for the coal mining project, all scenarios above US\$30/t coal sale price meet the satisfactory criteria (Table. 3-14). In order to create and secure the long-term coal market for this mining project, the sales price of the coal for the power plant may need to be considered less to make the coal power project more attractive.

For the long term power sales agreement with EDC, US\$0.9/kWh or less might be realistic to convince the government of Cambodia for the long term purchase agreement and an exclusive high voltage transmission installation. Since this cost

analysis is conducted based on the limited information with rough estimation, trading price should be deeply analyzed in the next stage.

It is to be noted that the break-even point, ideal FIRR for both coal mining and coal power project, of coal trading price is US\$30.42/t when the wholesales price of electricity is 0.09US\$/kWh

### 3.7.3 Cash-flow projections and financial internal rate of return (FIRR) for integrated coal mining and power project

In order to simplify the analysis and eliminate the uncertain factors, the integrated coal mining and power project was analyzed as follow. Considered cash flows and the investable criterion for the project feasibility are as same as the mining and power projects except coal trading. Since the coal sales and purchase will cancel each other, we could only consider the power sales pricing as the key parameter.

**Table. 3-16 FIRR for the Integrated Coal Mine and Coal-Fired Power Project**

Project year	1	2	3	4	5	6	7	8	9	10	11
<b>Cost</b>	<b>234</b>	<b>200</b>	<b>59</b>	<b>167</b>	<b>150</b>	<b>147</b>	<b>145</b>	<b>142</b>	<b>140</b>	<b>133</b>	<b>84.8</b>
CPP Initial Investment	198	198	44.0								
CPP O&M	0.0	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
CM Initial Investment	36.0	2.0	2.0								
CM O&M	0.0	0.0	13.4	80.4	80.4	80.4	80.4	80.4	80.4	80.4	80.4
Loan Repayment	0.0	0.0	0.0	64.0	50.0	50.0	50.0	50.0	50.0	46.2	0.0
Interest Payment	0.0	0.0	0.0	18.0	15.0	12.0	10.0	7.0	5.0	2.0	0.0
Short term loan interest	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Benefit</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>	<b>280</b>
Power Sales	0.0	0.0	0.0	280	280	280	280	280	280	280	280
<b>Net Balance</b>	<b>-234</b>	<b>-200</b>	<b>-59</b>	<b>113</b>	<b>131</b>	<b>134</b>	<b>136</b>	<b>139</b>	<b>141</b>	<b>147</b>	<b>196</b>

Source: Study team

Given a satisfactory criterion - FIRR above 15% as an investable bench mark, eventually, power sales pricing above 0.08US\$/kWh will be able to make the proposed project attractive for potential investors (Table3-17). Though the proposed project is quite a challenge for operator(s) due to the first domestic coal mining and the largest power project in Cambodia, it is certainly profitable for both sides under this preliminary analysis.

**Table. 3-17 Sensitivity analysis of coal mine and coal power project's FIRR**

FIRR (%) for		Power Sales (US\$/kWh)						
		0.06	0.07	0.08	0.09	0.10	0.11	0.12
Cost: Initial investment 480 Million US\$ Annual O&M 85 Million US\$/y	23ye 130%	-0.4%	4.1%	7.8%	11.0%	14.0%	16.8%	19.5%
	125%	0.8%	5.2%	8.9%	12.1%	15.2%	18.0%	20.7%
	120%	2.0%	6.3%	10.0%	13.3%	16.4%	19.2%	22.0%
	115%	3.2%	7.5%	11.2%	14.5%	17.6%	20.6%	23.3%
	110%	4.4%	8.7%	12.4%	15.8%	19.0%	22.0%	24.8%
	105%	5.7%	10.0%	13.8%	17.2%	20.4%	23.5%	26.3%
	100%	7.1%	11.4%	15.2%	18.7%	22.0%	25.1%	28.0%
	95%	8.5%	12.8%	16.7%	20.3%	23.6%	26.8%	29.8%
	90%	10.0%	14.4%	18.3%	22.0%	25.4%	28.6%	31.7%
	85%	11.6%	16.0%	20.1%	23.8%	27.3%	30.6%	33.8%
	80%	13.3%	17.8%	22.0%	25.8%	29.4%	32.8%	36.1%
	75%	15.2%	19.8%	24.0%	28.0%	31.7%	35.2%	38.5%
	70%	17.2%	22.0%	26.3%	30.4%	34.2%	37.8%	41.3%

Source: Study team

#### 4 Socio-economic impacts of coal mine and coal power development project

Due to the lack of energy source availability in Cambodia, the proposed coal mine and power generation project will lead wide range of positive socio-economic impacts on the Cambodian nation. Some of notable impacts are as follow:

##### Improvement of electric power infrastructure

The proposed project will greatly contribute to improve the poor electric power infrastructures in Cambodia. Cambodia has successfully attracted FDI's due to the advantage in facilitation of light manufacturing except electric power supply. As described previously, most of middle to large scale manufacturing has installed their captive generators powered by diesel or heavy fuel oil (HFO). Since the low generation efficiency and high cost imported fuel, the electricity cost is one of major critical issues for manufacturing sectors in Cambodia. In addition, the import fuel is greatly affected by the international crude oil price so that too high fluctuation of the operation costs has made businesses difficult in Cambodia. Since the capacity of new coal power is large enough to supply base load of major cities connected by the new national grids, EDC is able to reduce the electricity charge by smart mix of low cost and stable coal and hydro power, and high cost but good response diesel and HFO power. The realization of privates' domestic coal power generation with public's national grid development is likely to encourage FDI's, especially in light industries.

The domestic coal power development also contributes to the Cambodian energy security in the future. As the development of the EDC's national grid, more and more commercial and residential users are expected to access the electricity. The government of Cambodia is planning to import relatively low cost electricity from Thailand, Lao PDR, and Vietnam. However, as same as Cambodian situation, the demand for the electricity in those countries is sharply rising at this moment. As a result, the price of imported electricity may increase, or EDC may not be able to buy sufficient amount of electricity from those countries. Moreover, except Lao PDR,

Cambodia and the other countries have had border issues for centuries. Even in 2008, the Thai military invasion in a world heritage temple in a northern border city in Cambodia has brought emotional irritation in Cambodian people. Thus, the energy independency is critical matter for Cambodian sustainable development. Due to the domestic coal mining and power generation, the proposed coal power project could be one of the most important and reliable power sources in Cambodia.

Even with present unstable power supply, demand for electricity in residential sector has continuously been increasing as rising demand for better living standards not only in the urban area but also in rural communities. Especially in rural communities, people have depended on small IPPs that have charged roughly three to five times higher price than that of EDC Phnom Penh. (EAC Website) The development of the national grid attached with local networks will greatly contribute to the improvement of the living standard in connected small communities by the access to the low priced electricity.

#### Industrial sector development and new employment creation

The improvement of the power infrastructure in Cambodia is likely to encourage additional FDIs as well as domestic business investment. In other word, the successful hosting of the FDIs and adequate support for domestic investments will sustainably create new employments for educated new generations as well as unskilled workers. Though the population of Cambodia has stably increased for last 10years, the development of industrial sectors has not increased accordingly.

There are increasing numbers of mining FDIs in mineral sectors in Cambodia. All projects are developed for mineral exporting which may not contribute to Cambodian industrial sector development. In order to increase the benefits from the mineral resources in Cambodia, industrial sector development and capacity building of workforce is required. The coal mining and coal fired power generation require substantial amount of skill and non-skill workers domestically.

Though mining and power engineers may not be available at this moment, the On-the-Job-Training will be likely to develop the skill workers capacity and transfer the mining and coal fired technologies from the advanced countries. The mining technologies can be applied to other mineral and non-mineral mining sectors. The coal power technologies can be applied to wide variety of industries equipped with high pressure steam systems for production. Also, the electric engineers in the coal power plant can be applied to any middle to large scale industries. Collaboration with technical institutions such as Institute of Technology of Cambodia (ITC) may mutually benefit both privates and young generations, who may lead Cambodia in the future. Public schools are responsible for capacity development of young generations along with governmental development policy. As power sector improvement is one of the priority goals for Cambodian government, engineering schools such as ITC are seeking for opportunities to provide education for market needs (Dr. Romny Om, the dean of ITC).

Environmental technologies for air pollution control and waste management for coal ash are also potential sectors of development. Coal ash cement production would be one of potential secondary business sectors in the region. If economical clinker and gypsum are reachable, the project site would be most suitable for cement production due to the availability of heat energy and additives (coal ash).

#### Regional development

The proposed project is able to commit the northern communities' mid to long term development. Once the project starts, it will continuously require substantial number of workers at the project site for at least project life (+20years). Wide variety of direct supporting businesses such as parts suppliers and indirect businesses such as residential services and restaurants will be also required for at least the project life. Though the reliable information has not unveiled yet, not only the project site but also surrounding area are geologically highly potential for similar coal reserves. In case of the successful development of high voltage transmission lines required for the proposed project, other coal mine owner may follow mining or coal power development. As a result it is likely to contribute the regional development even after the proposed project's life time. As stable and higher income from mining or coal power plant, residents' higher purchasing power is likely to push up the regional economy for long time.

#### Agribusiness development

The proposed project will contribute to the agribusiness development in the region for mid to long term period of time. Once the coal recovery is finished, the mining site will be filled with coal ash covered with surface ground. The reclaimed land can be used for large scale crop production or other agricultural production for agribusiness. Some portion of the reclaimed land may be required to conduct forestation for the mitigation purpose of the present condition. Though the labor cost will not be a big issue, contemporary controlled agriculture may be suitable to maximize the profits from the reclaimed land. The contemporary farming will be managed by agricultural machineries. The quality of final products is controllable, and the market value of the controlled products is likely to bring higher return.

Abundant water supply from mining site will contribute to higher production in the reclaimed farm land as well as surrounding farm land. Geologically, substantial amount of ground water will disturb the mining operation throughout the year. However, such by-product will be reserved for cooling water as well as agricultural usage. Due to the little precipitation during the dry season, there are few agricultural activities in the region. As a part of drainage requirement and corporate social responsibility (CSR) of the proposed project, irrigation shall be provided in and around the mining site with minimum charge. As many courtiers encourage agriculture production, lower electricity charge for agricultural pumping purpose can be considered as well.

#### Ground mine and unexploded ordnance (UXO) clearance

The proposed mining operation could efficiently remove the ground mines and possibly UXO faster in and around the mining site. Public private partnership (PPP) in the field of ground mine and UXO cleaning will be beneficial option for both Cambodian government and mining operator(s). There are still substantial victims of such hidden explosives in Cambodia. CMAC has been actively working on the cleaning operation with national budget and international aids. However, because of too much scattered contaminated area, the completion of cleaning operation is not certain. According to a deputy director of CMAC, the cleaning operation will surely take more than a half century. The proposed mining area is also a part of active operation area so that CMAC is likely to collaborate with the ground cleaning activities for mining preparation. As a sustainable operation of CMAC, the authority



is always seeking for private partners to enable mutual benefits on both CMAC and privates' objectives. Faster and intensive cleaning operation will benefit not only for mining operators and workers in short term but also for the communities in the long run.

## **5 Project formulation plan – the roles of Public and Private Partnership**

### **1. PPP scheme for the integrated coal mining and power generation project**

This integrated coal mining and power generation project is the first large scale coal-fired power project in Cambodia and most likely to be realized in the Private Public Partnership (PPP) scheme. The coal mine is under the license of private entity and the entity is willing to integrate power generation project as a main user of the coal. In Cambodia, most of power projects have been implemented by the IPP basis along with the master plan on power sector improvement in the past decades. The proposed power generation project is also most likely to be implemented by the IPP scheme, whereas development of transmission line, sub-stations and equipments for environmental protection should be prepared by public sector with supports from international donor communities.

### **2. Ideal Combination of PPP**

A proposed ideal combination of the roles of stakeholders surrounding the project is as follow;

Role of private sector:

- 1) Coal mining
- 2) Coal-fired power generation

Role of public sector:

- 1) Clearing land mines (already land mine clearance has been carried out by the Government for over 10 years)
- 2) Access road (access road toward the mining site has been built up and yet some portion remained to be developed).
- 3) Transmission line from the coal power plant to existing transmission line in Siem Reap

### **3. Possible Japanese Consortium Set Up**

Since this study is initiated and subject to identify potential investors for power generation project and related international aid community's assistance, we propose this project to be implemented by a "Consortium." The possible consortium may be consisted of:

- 1) Project promoter/consultant: JDI and other specialized consultants
- 2) Coal and power plant investor/operator: (likely power utility company to be selected)
- 3) Investment and logistics: Japanese trading company (to be selected)
- 4) T/A and F/A: JICA for exploration study and master plan on coal-fired power generation project as well as concessional loan for EDC to develop transmission line in concern.
- 5) Joint Finance: JBIC (Overseas Investment Loans for mining and power project) and private banks' investment loan for the proposed integrated coal mine and power generation project

## 6 Implications for project mobilization

This project is one of the most beneficial and urgent projects in Cambodia because Cambodia socio-economic growth potentials have been hindered by the poor, unreliable, and high cost power sector by now. The power sector has been under-developed in Cambodia covering only 15-17% of people. There are only individual urban grid systems available without national grid. Installed capacity of capital cities, Phnom Penh is only 250 MW level right now. The level of the electric charges is the highest level in the region, which is roughly two to three times of Vietnam and Thailand.

Consequently, majority of large electricity users such as hotels, hospitals and manufacturing companies have their own captive generators powered by diesel or HFO. Taken these circumstances into account, promoting investments on manufacturing and tourism to Cambodia has been difficult. Therefore, an immediate action to improve the power sector through realization of the proposed project is necessary, particularly in collaboration between private power and mining operators, and public sector. For speedy implementation of the integrated coal mine and power generation project, we are proposing the following action plan to be undertaken:

**Table. 6-1 Action Plan for the Integrated Coal Mining and Power Project**

1	2009 – 2010	Further exploration of the coal mine area: confirming coal reserve and quality
2	Early 2009 – Mid 2009	Negotiation among investors and financial agencies, development of a consortium
3	Mid 2009 – End 2010	Detail feasibility study for both coal mine and power generation project components simultaneously
4	Mid 2010 – End 2010	Obtain a generation licensee for the 400 MW power plant (MIME/EAC), the project development approval (CDC), long-term off-take agreement(s) (MIME/EDC and/or EGAT for 10 to 20 years)
5	Mid 2010 – End 2010	A financing plan: equity and various loans (JICA (transmission), JBIC and private banks(mining & power), NEXI(insurance)
6	Early 2011 - End 2013	Implementation of coal mine, power generation and transmission line shall be commenced at the same time

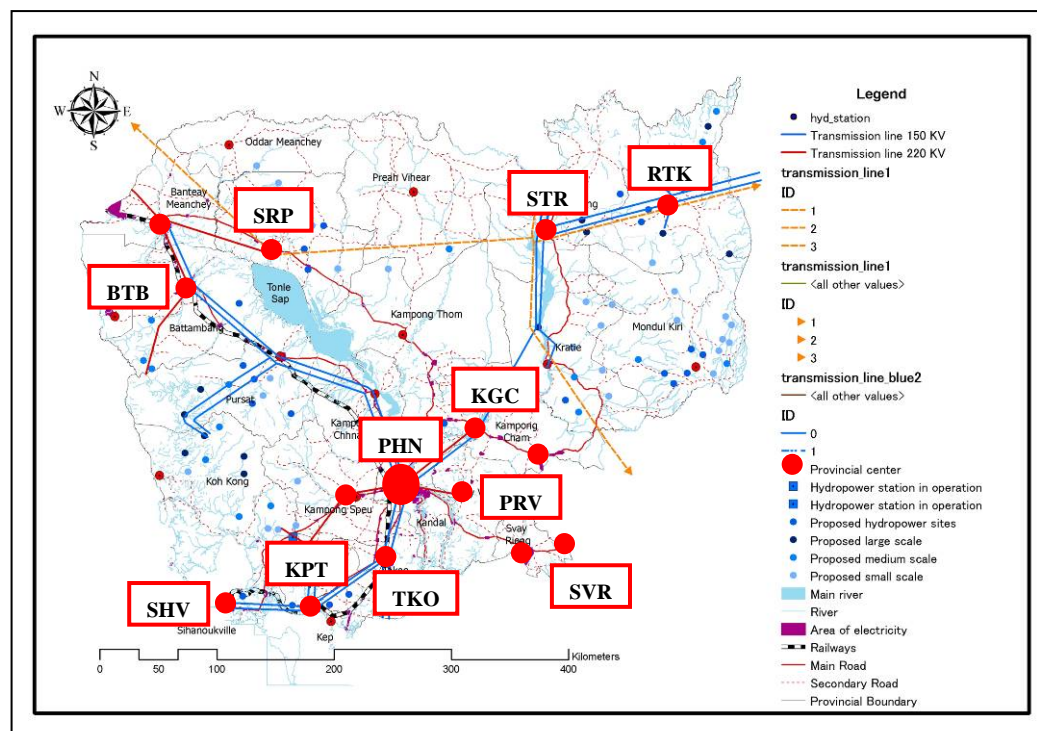
## **Appendix**

## A1. Trend of EDC's customers

Year	PHN	SRP	SHV	KGC	PKK	MMT	TKO	BBG	BVT	KGT	KPT	PRV	RTK	Total
2001	111,908	8,278	6,974	3,575	774	1,500	2247	9588	-	-	-	-	-	144,883
2002	132,795	8,660	7,290	4,427	774	1,500	2,405	10,191	1,016	-	-	-	-	169,058
2003	140,611	9,580	7,841	4,999	983	1,795	2,483	14,116	1,204	1,333	-	-	-	184,945
2004	150,726	10,719	8,181	5,081	1,208	1,996	2,555	15,488	1,426	1,643	4,674	2,587	2,192	208,476
2005	162,605	12,142	8,197	5,350	1,401	2,774	2,604	16,271	1,661	1,777	-	-	2,471	217,253
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	263,730

Source: EDC (website in Feb.2009)

PHN: Phnom Penh  
SRP: Siem Reap  
SHV: Sihanouk Ville  
KGC: Kampong Cham  
PKK: Ponhea Krek  
MMT: Memut  
TKO: Takeo  
BTB: Battambang  
BVT: Bavet  
KGT: Kampong Trach  
KPT: Kamport  
PRV: Prey Veng  
RTK: Rattanakiri



## **A2. Relevant Laws on Mining and Power Sector**

1. Law on Mineral Management and Exploitation
2. Mining Law and Related Regulation for Mineral Development in Cambodia
3. Cambodia Power Sector Strategy 1999-2016, MIME(1999)
4. Law on Taxation
5. Law on Environmental Protection and Natural Resources Management
6. Sub-decree on Environmental Impact Assessment Process

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Preah Reach Kram NS/RKM/0701/09

Enacted July 13, 2001

## **LAW ON MINERAL RESOURCE MANAGEMENT AND EXPLOITATION**

### **CHAPTER I: General Provisions**

#### **Article 1:**

The purpose of this law is to determine the management and exploitation of mineral resources, the manipulation of mines and all activities relating to the mining operation in the Kingdom of Cambodia save for the mining operation of petroleum and gas which shall be under a separate law.

#### **Article 2:**

Ownership of all mineral resources in, on or underneath the land, mountains, plateaus, territorial water and sea islands, and in or on seabed within the territorial integrity of the Kingdom of Cambodia, shall be included in the property of the State.

#### **Article 3:**

Mineral resources include any substance, whether in solid, liquid or gaseous form, naturally originated by a geological process or as a result of mining in or on the land, or in or on the sea or seabed, including gemstones, coals, metal and non-metal mines, mineral water, rock, gravels, sand, clay, petroleum and gas.

The mining operation includes the prospecting, exploring and exploiting of mineral resources.

Prospecting is the preliminary exploration of the land surface by using simple instruments, involving only minor ground disturbance, in order to determine the presence of mineral of possible commercial value which may be subjected to an application for the mineral resources exploration and exploitation license.

Exploration is an investigation for the purpose of discovering and testing mineral indexes by prospecting, geological, geophysical and geochemical surveying, excavations, drilling, removal and analysis of soils, silts, water, rock and mineral samples, to determine the potential, extent, quality, quantity and economic and exploitation feasibility.

Exploitation of mineral resources is the mining operation whereby minerals are extracted from any mineral deposit processed, transported, sold or exported for commercial ends. Sale, exportation and importation of valuable metals and gemstones in raw state and after transformation shall be governed by the provisions of laws in force of the Kingdom of Cambodia.

### **CHAPTER II: Mineral Resource License**

#### **Article 4:**

Mineral resource license is a permit granted by a competent institution to the holder the right to conduct the activities of mining operations.

#### **Article 5:**

No legal entity or natural person shall conduct mineral resource exploration or exploitation without a mineral resource license issued by a competent institution except for any owner or lawful occupant of private land who may use gravels, sand,

rock or clay without the license, but is not allowed to transport out of the owned land boundaries for exploitation.

Any person of Khmer nationality may prospect for minerals on the State land which is not held under such license issued by the State to another person.

**Article 6:**

A natural person or legal entity may only be issued a mineral resource license based on thorough considerations for technical and financial capability and commercial registration.

**Article 7:**

Before entering any privately owned land for the purpose of conducting exploration or mining, the holder of a license shall obtain the written agreement of the private land owner with respect to non-interference with and non-infringement upon the property and work, and compensation for inconvenience and any damage to the surface of the land as a result of activities of mineral operation.

Before entering certain State owned lands designated as a protected, reserved or restricted areas for the purpose of conducting exploration or mining, the holder of a license shall obtain the written permission of the competent institution or the inter-ministerial institution responsible for the management of such areas.

**Article 8:**

It shall be prohibited from conducting the prospecting, exploration and mining on those State owned lands designated as national cultural, historical and heritage sites.

**Article 9:**

No other mineral resource license shall be issued over an area already under license to another holder, without the written permission of the existing license holder or the written approval of the Minister in charge of mineral resource section stating that the exclusive rights of the existing holder are in inadequate satisfaction of legal requirements.

**Article 10:**

The Minister in charge of mineral resource sector manages and inspects all mineral resource operations to efficiently and effectively implement the provisions and procedures of Law on Mineral Resource Management and Exploitation.

The Minister in charge of mineral resource sector keeps and records in a register of every mineral resource license issued and of any dealings with a mineral license.

### **CHAPTER III: Mineral Resource License Categories**

**Article 11:**

Six categories of license shall be made available to applicants in order to facilitate the management of the exploration and exploitation of mineral resources within the Kingdom of Cambodia.

1. An Artisan Mining License may be issued only to persons of Khmer nationality for the purpose of conducting the exploration and exploitation of mineral resources by using locally available common instruments and their own labor or with the help of family with no more than 7 (seven) persons.

Mining crafts may explore and exploit mineral resources found only in loose state in silts, gravel, sand and rock, and within a demarcated area no larger than 1 (one) hectare, and to a maximum depth of 5 (five) meters.

2. A Pits and Quarries Mining License may be issued to qualified physical persons or legal entities for the purpose of conducting the exploration and exploitation of any

construction and industrial minerals used for constructions, chemical and secondary industry, and mined from pits and quarries.

The construction and industrial minerals include sand, gravel, crushed stone, laterite, clay, cement clay, coral, fossil, phosphorite, limestone, dolomite, marble, kaolin, pagodite, salt, potash, gypsum, peat, coal, titanium sand, silica sand or any other mineral compounds used for such purposes.

3. A Gem-Stone Mining License may be issued to qualified and competent physical persons or legal entities for the purpose of conducting the exploration and mining of precious and semi-precious stones, and ornament stones.  
Precious stones include diamonds, rubies, sapphires, smaragdites, and all other similar gem-stone quality minerals. Semi-precious stones include zircon, amethysts, topazs, and all other similar gem-stone quality minerals.  
Ornament stones are low crystal clear or non-transparent stone used for ornaments such as chalcedonies, **ashlaring**, normal opals, agates, jades, malachites, stone wood, black basalt, and all other similar quality stones.
4. A Mineral Transforming License may be issued to qualified physical persons or legal entities for the purpose of transforming precious or semi-precious stones or ornament stones.
5. An Exploration License may be issued to qualified and competent physical persons or legal entities for the purpose of conducting exploration of minerals and studying its potential.
6. An Industrial Mining License shall be issued only to the holder of an exploration license for the purpose of conducting exploration and mining of economically viable mineral deposit established within the boundaries of the exploration license. The holder of the exploration license shall submit technical, financial, environmental, social and economic analysis to determine the socio-economic feasibility of proceeding with a mining operation to ask for approval from the Minister in charge of minerals.  
A sub-decree will prescribed form and content of such a final feasibility study report and required accompanying documents, and the terms and conditions upon which an industrial mining license shall be issued.

**Article 12:**

Where the Minister in charge of mineral resource determines that an exploration or mining license application to indicates a large scale project of special national significance, he shall enter into negotiations with the applicant reach a supplementary Mineral Investment Agreement to be appended to the license.

**Article 13:**

For certain unlicensed areas of known mineral potential, the Minister in charge of mineral resource may, by public notice, declare as an area reserved for bidding by preparing a formal negotiation and evaluation to issue an appropriate mineral license and, where required, negotiation of a supplementary mineral investment agreement as described in Article 12.



## **CHAPTER IV: MINERAL RESOURCE LICENSE PROCEDURES**

### **Article 14:**

Khmer citizen may submit in person the application for an artisan mining license to the specialized office of the Ministry in charge of minerals, located in provinces/ municipalities in where the artisan mining license area is situated.

### **Article 15:**

Natural persons or legal entities shall submit applications for all other licenses issued under the authority of this law to the Minister in charge of mineral resources.

### **Article 16:**

The Minister in charge of mineral resources sector shall provide a response as to his approval or rejection of an application within forty five (45) days at the latest following the date of receiving a complete and technical compliance application.

### **Article 17:**

Except for the artisan mining license, the holder of all other licenses issued under the authority of this law may request to renew, modify, return, mortgage, assign or inherit it with a written approval from the Minister in charge of minerals.

### **Article 18:**

A license issued under the authority of this law may be suspended or cancelled for any holder who breaches this law.

Procedures of suspension or revocation of a license shall be determined by sub-decree.

### **Article 19:**

The holder of a license issued under the authority of the law shall submit to the Minister in charge of mineral resources the application forms, reports, plans and notices at the prescribed date and maintain records and documents.

### **Article 20:**

The confidentiality of all documents and information as provided in Article 19 of this law shall be maintained until the termination of such license or subsequent to the receipt of an approval from the holder to allow public disclosure of such information:

- Provided that information related to environmental and social issues may be released to the public upon notice to the holder of such action by the Minister in charge of minerals;

And provided that the Ministry in charge of minerals may compile and publish statistics quoted from the holder's documents and information as it relates to national mineral sector analysis.

## **CHAPTER V: Exploration and Mining Operation**

### **Article 21:**

Every license holder or subcontractor shall be responsible for the proper conduct of exploration and mining operations in compliance with the following determinations:

1. Properly conducting operations in technically and financially effective and efficient manner, as detailed in an exploration work program or a mine feasibility study.
2. Protection of environment as detailed in Law on Environment Protection and Natural Resource Management, an environmental impact assessment and study, an environmental management plan, a mine site restoration and rehabilitation and financial guarantees.

3. Ensuring the protection of worker health and safety to be detailed in a mine plan program, and a mine health and safety program containing accident prevention and reporting procedures.
4. Protecting safety of the public in and around mine sites to be detailed in a mine plan.
5. Educating, training and providing jobs to Khmer citizens to be detailed in an education, training and employment program.
6. Utilizing as much as possible goods and services within the Kingdom of Cambodia at appropriate place and time.

The Minister may further determine the necessity for the above work based on the category of license and the magnitude of the operation.

**Article 22:**

Guidelines on the form, plan expansion and increase and content of all necessary documents and work program, financial guarantee for proper implementation shall be determined by a Prakas of the Minister.

**Article 23:**

In each necessary case, the Minister shall appoint competent officials to monitor the implementation of this law.

Appointed officials shall:

1. Be responsible to the Minister for methods of administration in accordance with the provisions of the law.
2. Prepare an annual report on regulatory activities of exploration and mining during the preceding year and submit it to the Minister.
3. Collate information and maintain records of operations of explorations, mining, treatments, marketing and exportation of mineral resources and products.
4. Follow up and monitor to ensure that all provisions of this law have been implemented.
5. Make inspection to ensure that all regulations relating to the health and safety of workers and of the general public have been properly applied.
6. Perform other duties as determined by the Minister.

The power and duties of the officials appointed to monitor, inspect and report on all activities relating to the exploration, mining, research and analysis related to the methods of administration under the authority of this law shall be prescribed in Sub-decree.

**Article 24:**

Based on coordination of the Ministry in charge of minerals, the holder of a license shall ask for advice from relevant Ministries to carry out the exploration and mining operations in localities, provinces, municipalities, districts, and Khans in accordance with the principles of social and economic development of the Royal Government of Cambodia.

## **CHAPTER VI: License Holder and Land Owner**

### **Article 25:**

The holder of a license shall indemnify the land owner both in and out of the license area against damages caused by his/her mining operations regardless of accidental or anticipated damages.

Where the damage is caused by the mining operation of more than two holders of the license, those two holders shall jointly make indemnification against such damage.

The indemnification shall be made as follows:

- Where the mining operation area determined in the license impact the owned land, the land owner shall permit the holder of the license to conduct the mining operation on such land with prior mutual agreement whereby the owner shall receive fair and just compensation.
- Such compensation shall be made in time or finally made in accordance with the agreement between the owner and the holder of the license.
- Where the owner and the holder of the license disagree with the compensation, the Minister shall facilitate and solve it and request, if failed, the Royal Government to create a joint commission to settle this case.
- Where both parties disagree with the settlement of the joint commission, the decision shall be under the jurisdiction of the court.

### **Article 26:**

Where the ownership of the whole or a part of a mining operation area determined in the license has not been granted to any person, a competent authority cannot issue title to the whole or a part of such area to any party unless the Royal Government permits as requested by the Minister.

Where people are living in the license operation area prior to the date of issuing such license, the holder of the license shall make compensation as provided in Article 25.

## **CHAPTER VII: Financial Provisions**

### **Article 27:**

An applicant or holder of a license shall pay the State the fees of registration, application for suspension, renewal, transfer and annual land rental.

### **Article 28:**

With the exception of the holder of an exploration license and mineral transforming license, the holder of all licenses shall pay the State a royalty on the value of minerals extracted.

The holder of a mining license as provided in the above paragraph shall keep books of accounts and furnish to the Minister reports or records regarding such information.

### **Article 29:**

The Minister may deliver a notice to the holder of a mining license to provide further information of sales contracts, inspect and audit books of accounts, and consult with the holder in order to establish the value of the mine output.

### **Article 30:**

It shall be prohibited to dispose of minerals on which the royalty has not been paid or without a written permit from the Minister.

**Article 31:**

According to the applicable laws, a special tax regime shall be established for application to the output and revenue gained from the 6 (six) categories of the mining licenses as provided in Article 11.

**Article 32:**

The rate of royalty on the value of mineral resources, methods of royalty payment to the State, and incentives for competent officials as provided in Article 23 shall be determined by Inter-Ministerial Prakas.

Taxes, duties, tax on shares, tax on personal share, provision, method of expenditure, tax payment procedure, accounting and financial principles and practices, definitions of losses, exemption and incentives of investment in mineral sector shall comply with laws in force.

**CHAPTER VIII: Penalties**

**Article 33:**

Any person who conducts the operation of the mineral resource exploration without a mineral resource license shall be liable to a fine ranging from 500,000 (Five Hundred Thousand) Riels to 1,000,000 (One Million) Riels.

In case of recalcitrance, the penalty shall be from 1,000,000 (One Million) Riels to 2,000,000 (Two Million) Riels, or such person shall be punished by 1 (one) month to 1 (one) year imprisonment, or both punishments.

**Article 34:**

Any person who conducts the exploration operation in violation of the second paragraph of Article 7 or of Article 8 of this law shall be liable to a fine ranging from 5,000,000 (Five Million) Riels to 10,000,000 (Ten Million) Riels, or punished by 6 (six) months to 2 (two) years imprisonment or both penalties.

**Article 35:**

Any person who conducts mining operation without a mining license or in violation of Article 7 and Article 8 of this law shall be liable to a fine of an amount equal to 3 (three) times the assessed value for a period the output of mineral has been extracted based on the size of apparatuses, used production machinery and quantity of minerals within such area, and shall be punished with a fine ranging from 1,000,000 (One Million) Riels to 10,000,000 (Ten Million) Riels per diem starting from the date such person illegally committed to the date the activities of mining operation have been ceased, and by imprisonment ranging from 1 (one) year to 5 (five) year regardless of compensation for damages. And the apparatuses and production machinery shall be confiscated into the State's property.

**Article 36:**

Any person who conducts the mining operation with an expired mining license shall be punished as provided in Article 35 of this law.

**Article 37:**

Any holder who violates Article 30 of this law shall be liable to a fine of double the value of the minerals disposed or a revocation of the mining license or both punishments.

**Article 38:**

Any holder who does not allow the competent inspecting official(s) as provided in Article 23 of this law to enter his/her mining operation site for inspection shall be

punished with a fine ranging from 5,000,000 (Five Million) Riels to 10,000,000 (Ten Million) Riels or with a suspension of the mining license for a period no longer than 6 (six) months.

In case of repeated offense, the mining license shall be finally revoked.

**Article 39:**

Any person who is not a legal land owner and causes obstruction in the mining operation of the holder who legally possesses the mining license shall be punished with imprisonment ranging from 6 (six) days to 1 (one) month.

**Article 40:**

Any competent official of the Ministry in charge of minerals who commits conspiracy or offenses against the provisions of this law shall be liable to the administrative punishment regardless of penal offenses.

**CHAPTER IX: Transitional Provisions**

**Article 41:**

Any natural person or legal entity who kicked off to explore or exploit the mineral resources with an official permit prior to this law coming into force may carry on its activities but shall submit the application for a new mining license within 90 (Ninety) days at the latest in accordance with the provisions of this law.

**CHAPTER X: Final Provision**

**Article 42:**

Any provision contrary to this law shall be abrogated.

## **MINING OPPORTUNITIES IN THE GREATER MEKONG SUB-REGION**

16-17 June, 2006  
Vientiane, Lao PDR

### **MINING LAW AND RELATED REGULATION FOR MINERAL DEVELOPMENT IN CAMBODIA**

*By H.E. Mr. Chea Sieng Hong  
Secretary of State  
Ministry of Industry, Mines and Energy  
Kingdom of Cambodia*

To attract domestic and foreign mining companies to the investment in mineral exploration and exploitation in Cambodia, the Law on Management and Exploitation of Mineral Resources was promulgated on 13 July 2001.

#### **SECTION A: Law on Management and Exploitation of Mineral Resources**

The Law has 42 articles spreading over 10 chapters govern the management and exploitation of mineral resources in the Kingdom of Cambodia. The following is highlighting the main provisions of the Law.

##### **1- GENERAL PROVISIONS**

Three articles define the mineral resources management and mining, use of mines sites and all activities related to mineral operations in the Kingdom of Cambodia, except for oil and natural gas operations that shall be governed by a separate law. All mineral resources, found in, on or under the ground, mountains, plateau, internal waters, territorial sea, islands, seabed and under the seabed within the sovereignty of the Kingdom of Cambodia, are State property.

##### **2. MINERAL LICENSE**

Seven articles define the eligibility of applicants, selection of mining companies and concessionaires' rights to carry out mineral operations. No natural person or legal entity can explore for or exploit mineral resources without a mineral license issued by the competent institution, except for a land property owner or a legal land occupier who can privately use gravel, sand, clay and rocks without a mineral license, but shall not be permitted to transport those materials from the boundaries of her/his own property land for trade purpose.

To acquire a mineral license, the natural person or legal entity shall submit the application for mineral license to the Minister of Industry, Mines and Energy. The Natural person or legal entity can be granted a mineral license under consideration of her/his technical and financial capability and business registration.

Before entering any private property land to explore for and exploit minerals, a concessionaire shall enter into a written agreement with a land property owner with respect to non-interference and non-access by the land property owner and the compensation for any damage to the ground caused by his/her mineral operations.

Before entering the area of State property, determined as the protected, reserved or restricted areas, to explore and exploit minerals, a concessionaire shall have a written permit issued by the competent institutions or inter-ministerial institutions governing those areas.

The mineral prospecting, exploration and exploitation in State property land, determined as national cultural, historical and patrimonial sites, shall be prohibited.

### **3. CATEGORIES OF MINERAL LICENSE**

Three articles define the categories of mineral license. To effectively facilitate the management and exploitation of mineral resources within the Kingdom of Cambodia, the Law allows Cambodian people and natural persons or legal entities to apply for the following mineral license:

1. **Artisanal mining license** shall be issued only to Cambodians to explore for and exploit mineral resources by using locally available hand tools and by own labor or the number of family labor not exceeding 7.
2. **Pits and quarries mining license** shall be issued to a qualified natural person or a legal entity to explore for and exploit construction materials and industrial minerals, quarried from pits and used for constructions and chemical and processing industries.
3. **Gem Mining license** shall be issued to a qualified natural person or a legal entity to explore for and exploit precious, semi-precious and ornamental stones;
4. **Mineral [Gemstone] cutting license** shall be issued to a qualified natural person or a legal entity to cut precious, semi-precious and ornamental stones.
5. **Mineral exploration license** shall be issued to a qualified natural person or a legal entity to explore for mineral resources.
6. **Industrial mining license** shall be issued only to a concessionaire holding a mineral exploration license to explore for and exploit mineral resources found in commercial deposits located within the boundaries of the area of land granted under the mineral exploration License.

Procedures and contents of reports, final feasibility studies, references and conditions to issue an industrial mining license shall be stipulated in a sub-decree. In case that the application for a mineral exploration license or an industrial mining license indicates a large scale project and provides special benefits to the nation, the Minister in charge of mineral sector shall negotiate with the applicant to enter into a mineral investment agreement to be supplemented to the mineral exploration license or industrial mining license.

### **4. PROCEDURES TO ISSUE MINERAL LICENSE**

Seven articles are devoted to the procedures to issue mineral license. Cambodians can apply in person for an artisanal mining license at the provincial or municipal departments of the Ministry in charge of mineral sector, where areas of land for the artisanal mining license are located, while the natural person or legal entity shall apply for other mineral licenses under this law to the Minister in charge of mineral sector.

The Minister in charge of mineral sector shall give a written response of approval or disapproval to applicants within a maximum period of 45 (forty-five) days following the date of submission of the complete application for a mineral license.

Except for the artisanal mining license, the concessionaire who holds other mineral licenses under this law may apply for renewal, amendment, surrender, mortgage [encumber], assignment [transfer of rights], or inheritance of the mineral license with a written approval from the Minister in charge of mineral sector.

A mineral license issued under this law shall be suspended or revoked if the concessionaire violates the provisions of this law. The procedures of suspension and revocation of the mineral licenses shall be determined by a sub-decree.

### **5. MINERAL EXPLORATION AND EXPLOITATION**

Four articles define the responsibilities and obligations of concessionaires to carry out mineral exploration and exploitation and shall comply with the following operational requirements:

1. Carry out mineral operations with duly and effective way by following techniques and financial plans, which shall be detailed in an exploration work programme or in a mining feasibility study;
2. Protect the environment as detailed in the Law on Environmental Protection and Natural Resources Management, such as the study of environmental impact assessment, plan for environmental management, plan for restoration of mining sites, and financial guarantees;
3. Ensure the occupational health and safety of workers, which shall be detailed in a programme for mining plans and occupational health and safety in mining sites, including the protection of danger and procedures of reporting the danger;
4. Protect the public safety in and around mining sites, which shall be detailed in the mining plans;
5. Educate, train, and employ Cambodians, which shall be detailed in a programme for employment, education and training;
6. Commit the procurement of goods and services obtainable within the Kingdom of Cambodia, where and when it is appropriate.

To control the enforcement of this Law, the Minister of Industry, Mines and Energy shall appoint competent officials.

## **6. CONCESSIONAIRE AND LAND OWNER**

Two articles are devoted to the compensation for damage caused by mineral operations. The concessionaire acquiring a mineral license shall compensate the land owner(s) for both within and outside the area of land granted under the mineral license for damage caused by the mineral operations, regardless of whether or not such damage is accidental or anticipated. In case the damage caused by the mineral operations carried out by two or more concessionaires, the concessionaires shall jointly compensate the land owner(s) for the damage accordingly.

## **7. FINANCIAL PROVISIONS**

Six articles define the financial obligations to be fulfilled by concessionaires. The applicant or concessionaire, who holds a mineral license, shall pay the State fees for registration, for mineral license, for renewal of a mineral license and for transfer of rights, and annual land rental.

All concessionaires, who hold mineral licenses, shall pay the State royalties of the value of minerals exploited, except for the concessionaire acquiring the mineral exploration license or mineral cutting license.

Tax, custom duties, shareholding tax, dividend tax, provisions [for tax, liabilities and charges], expenditure procedures, tax filing and payment method, principles of accounting and financial practices, loss carried forward, tax exemption and investment incentives for mineral sector shall be applied to under the prevailing laws.

## **8. PENALTIES**

Eight articles define the penalties for violating the provisions of the Law. Any person, who violates any provisions of the Law, shall be liable to a fine from 500,000 (five hundred thousand) to 10,000,000 (ten million) riel or shall be liable to imprisonment from 1 (one) month to 5 (five) years, or to the both penalties.

The competent officials of the Ministry in charge of mineral sector, who conspires with a violator or commits a violation of the provisions of this law, shall be subject to administrative sanctions without prejudice to other criminal violations.



## **9. TRANSITIONAL PROVISIONS**

One article defines the transitional provisions. The natural person or legal entity, who started exploration activity for or exploitation activity of mineral resources and holds the official valid permit prior to this law coming into effect, can continue her/his work, but is required to apply for a new mineral license under the provisions of this law within a maximum period of 90 (ninety) days.

## **10. FINAL PROVISIONS**

All provisions contrary to this Law shall be abrogated.

## **SECTION B: RELATED REGULATIONS**

To effectively implement the Law on Management and Exploitation of Mineral Resources, a number of regulations were issued as following:

### **1. Sub-Decree (Regulation issued by the Royal Government)**

According to Sub-Decree No 8 dated 31 January 2005 and Sub-Decree No 113 dated 29 September 2005:

1. Applicants (natural person or legal entity) shall submit their application for mineral licenses, except industrial mining license, to the Ministry of Industry, Mines and Energy for review and approval according the Law on Management and Exploitation of Mineral Resources.
2. The concessionaire, holding mineral exploration license, may submit their application for industrial mining license at any time during the exploration period to the Council for the Development of Cambodia (CDC) for review and approval first. The Ministry of Industry, Mines and Energy shall issue an industrial mining license to him/her, provided that he/she has obtained the approval first from CDC.
3. All mineral resources mined in Cambodia shall not be allowed to export and shall be retained/reserved to meet/supply the demands of domestic factories to manufacture finished (mineral) products. Only finished products shall be allowed to export.

### **2.- Prakas (Regulation issued by MIME)**

- 2.1 On 25 May 2004, the Ministry of Industry, Mines and Energy (MIME) has issued the regulation on registration and procedures for applying for mineral licenses, renewal of mineral license and transfer right.

First of all, a director or shareholder of a company must come to complete a registration form, in person, at the Legal Affairs Division of the Ministry of Commerce. Documents to be submitted for registration of a Limited Liability Company include:

- |   |            |
|---|------------|
| 1. Registration Application Form  | 2 set      |
| 2. Memorandum and Articles of Association   | 2 set      |
| 3. Statement of Conformity  | 2 set      |
| 4. Application for Publication in the Newspaper   | 2 set      |
| 5. Copies of identification card or passport of directors shareholders  | 2 pcs each |
| 6. Photos (4cm X 6cm) of director and shareholders  | 2 set      |
| 7. Declaration on non-guilty of director  | 2 set      |
| 8. Resolution on share contribution (if a natural person is involved)   | 2 set      |
| 9. * if the office is located in a residence of any shareholder, the company is required to provide a real estate title | 2 set      |
| * if the office is located in a leased premise, the company is  | 2 set      |

required to provide a lease agreement

\* if the office is located in a hotel for a period of less than one year, the company is required to provide a lease agreement by the hotel owner. 2 set

And then, he/she has to come to complete a registration in person at the Ministry of Industry, Mines and Energy. Documents to be submitted for registration of a mining company include:

- |  |       |
|--|-------|
| 1. Registration Application Form   | 1 set |
| 2. Curriculum Vitae of applicant (director) certified by a commune where he/she is living with a photo (4cm X 6cm) of director | 1 set |
| 3. A Copy of Identification Card/ Valid passport certified   | 1 set |
| 4. Letter certifying the company's current address issued by a commune where it located  | 1 set |
| 5. A copy of Memorandum and Articles of Association  | 1 set |
| 6. A copy of Business Registration Certification issued by the Ministry of Commerce  | 1 set |

After registered at the two ministries, the director or shareholder (a natural person or legal entity) have to come to the Ministry to complete application form for mineral licenses (available at MIME) except industrial mining license and submit it to the Minister for review and approval. Documents to be submitted for mineral licenses shall include:

- |   |       |
|---|-------|
| 1. Application for mineral licenses, except industrial mining license   | 1 set |
| 2. Copy of Registration Certificate issued by MIME  | 1 set |
| 3. A proposed area(s) and location to be applied for  | 1 set |
| 4. Annual Financial Balance Statement for the last 3 years, certified by an auditor firm recognized by the Royal Government of Cambodia                                   | 1 set |
| 5. Plans for mineral exploration and/or exploitation and budget   | 1 set |
| 6. Documents of evidences showing company's financial capability, technical experience, labor, equipment and machinery to conduct mineral exploration and/or exploitation | 1 set |
| 7. Reports on environmental impact assessment, restoration plan and management; and   | 1 set |
| 8. Plan for recruitment of Cambodian employees and training programme   | 1 set |

Documents for renewal of mineral licenses to be submitted to MIME for review and approval shall include:

- |  |       |
|--|-------|
| 1. Application for renewal of mineral licenses, except industrial mining license                                       | 1 set |
| 2. Reports of the results of mineral exploration and/or exploitation   | 1 set |
| 3. Reports on environmental protection and restoration during the such period  | 1 set |
| 4. Balance of Restoration Fund and Training budget statements  | 1 set |
| 5. Report of payment of royalties, surface rental, and other taxes, attached with the evidence of payments             | 1 set |
| 6. Plan for the next period of mineral exploration and/or exploitation and plan for restoration and training programme | 1 set |

Documents for transfer right of mineral licenses to be submitted to MIME for review and approval shall include:

1. Application for transfer right of mineral licenses from transferor (concessionaire holding mineral license); 1 set
  2. Letter of Intention to accept the transferred right and take all responsibilities from the transferor with identification of clear reason 1 set
  3. Report of payment of royalties, surface rental, and other taxes, attached with the evidence of payments, done by transferor 1 set
  4. Copy of Registration Certificate (transferee) issued by MIME 1 set
  5. Annual Financial Balance Statement of transferee for the last 3 years, certified by an auditor firm recognized by the Royal Government of Cambodia
  6. Documents of evidences showing transferee's financial capability, technical experience, labor, equipment and machinery to conduct mineral exploration and/or exploitation; and 1 set
  7. Plans for mineral exploration and/or exploitation and budget proposed by transferee 1 set
  8. Reports on environmental impact assessment, restoration plan and management, made and proposed by transferee 1 set
- 2.2 According to the 2006 plan, the Ministry of Industry, Mines and Energy has committed to issue the following regulations regarding fees for registration, mineral license, extension of period of mineral license and transfer right, surface rentals, and royalties.
- a. Regulation on the determination of fees for registration, mineral license, extension of period of mineral license and transfer right
  - b. Regulation on the determination of rates of annual surface rental for concession areas
  - c. Regulation on the determination of royalty rates of mineral resources.
- 2.3. Law on Taxation was promulgated in 1997.
- 2.4 Model of Mineral Agreement – has 43 articles spreading over 13 chapters govern mineral exploration and/or mining projects to be carried out by concessionaires. To ensure all management of environmental protection, financial and work obligations and other requirements to be fulfilled by concessionaires while carrying out their mineral exploration and/or mining projects, they are required to enter into specific mineral agreements with the Ministry of Industry, Mines and Energy. Some key terms of mineral agreement is highlighting as following:
1. **Scope** - Determination of ore type to be explored for, the surface and coordinates of the concession area, who shall bear all the cost of mineral exploration and mining, who shall be responsible to the Ministry for carrying out mineral exploration and/or mining projects and for environmental protection
  2. **Period of Exploration** – is 6 years. **Exploration License** – issued each time is valid for 2 years. The exploration license can be renewed up to 2 times for a period of 2 years. The exploration license can be renewed, provided that the concessionaire has applied for an extension at least ninety (90) days prior to the expiration of current valid mineral exploration license with documents required in the Ministry's regulation.  
  
At the end of the sixth or final year of the exploration period, the Ministry may approve an extension of such license for an additional limited period where he/she need it to study economic feasibilities of this mineral deposit or to proceed to apply for a mining license.
  3. **Period of Mining** - The period of mining could be 30 years. If the period of mining is expired and the mining operations have still been indicated commercially, the Minister of Industry, Mines and Energy may extend the period of mining two (02) times for a period of five (05) years upon the submission of request of the concessionaire.

4. **Mining License** - The concessionaire, holding the exploration license, may apply for industrial mining license at any time during the exploration period to the Council for the Development of Cambodia (CDC) for review and approval. The Ministry of Industry, Mines and Energy could issue an industrial mining license provided that he/she has obtained the approval from CDC. Documents to be submitted for industrial mining license include:

- |   |       |
|---|-------|
| 1. Application Form for Mining License  | 1 set |
| 2. Mining sites proposed and map and Processing Plan  | 1 set |
| 3. Instruments and facilities for mining operations   | 1 set |
| 4. Reports on environmental impact assessment, restoration plan and environmental management plan | 1 set |
| 5. Reports on marketing mineral products  | 1 set |
| 6. Reports on financial analysis and capital investment and operating cost analysis               | 1 set |
| 7. Programmes for employment, education and training of Cambodian citizens                        | 1 set |
| 8. Plan for procurement of goods and services obtainable within Cambodia.                         | 1 set |

The industrial mining license shall be renewed up under the mining period, provided that the concessionaire has applied for an extension at least ninety (90) days prior to the expiry date of the valid mining license and submit the following reports and plans to the Minister for review and approval:

- |   |       |
|---|-------|
| 1. Application for renewal of industrial mining license   | 1 set |
| 2. Detailed reports on the result of mining operations (amount of minerals mined, chemical analysis, etc.) during the previous years; | 1 set |
| 3. Reports on the environmental protection and areas to be restored;  | 1 set |
| 4. Balance of Restoration Fund and Training budget statements   |       |
| 5. Financial Statement, by proving payment of royalties, annual land rental, income tax, and other taxes.                             | 1 set |
| 6. Mining operations and restoration plan for the next extension of mining period.  | 1 set |
| 7. Programmes for employment, education and training of Cambodian citizens for next extension of mining period                        | 1 set |
| 8. Plan for procurement of goods and services obtainable within Cambodia for the next period.   | 1 set |

#### 7. **Work Obligations of Concessionaire**

- Mining operations - by using modern techniques and its own budget as detailed in an approved exploration work programmes or an approved mines feasibility study;
- Provide all capital, technology and manpower necessary to conduct mineral operations;
- Protection of environment – including the study of environmental impact assessment, environmental management plan and mines site restoration, and deposit of restoration fund;
- Insurance of the occupational health and safety of worker;
- Protection of the public safety in and around mines sites;
- Relinquishment - shall be made at any time during the exploration period at least thirty (30) percent of the initial area. Each area relinquished shall be not less than ten (10) percent of the initial area and shall be composed of contiguous blocks in conformity with the geometric requirements.

- Submission of reports – Concessionaire shall keep the Ministry regularly at the end of each month and fully informed of mining operations. He/She shall submit to the Ministry within ninety (90) days after the end of each calendar year reports on mining operations and financial statement incurred in that year;
  - Confidentiality - The confidentiality of data and analyses and interpretations pertaining to mining operations shall be treated until the agreement is terminated or data is allowed to be disclosed by the Concessionaire upon the request of the Ministry. When the agreement is expired, all data and analyses and interpretations shall be given to the Ministry.
8. **Financial Obligations of Concessionaire** - The concessionaire shall pay mineral license fees involved, annual land rentals, royalties on the value of minerals extracted and other taxes involved under the Law of Taxation of the Kingdom of Cambodia
  9. **Mineral Costs** – could include exploration costs, development costs, production costs, and general and administrative costs, which is allowed to be recovered under his/her accounting system.
  10. **Valuation of Finished Products** - The valuation of finished products shall be determined and mutually agreed by the both parties, based on international market prices in order to pay royalties.
  11. **Export and Sale of Finished Products** - Concessionaire shall apply for other licenses to the concerned ministries and competent institutions of the Royal Government to export and sell all or portion of finished products, mined from his concession area and produced by his plant/factory built in Cambodia, in conformity with the prevailing laws of the Kingdom of Cambodia.
  12. **Right to Employ Immigrant Aliens** – Concessionaire is free to hire Cambodian nationals and foreign nationals of their choosing in compliance with the Labor Law and the Immigration Law. Foreign employees who are hired longer than six (06) months shall pay tax on salary under the prevailing Law on Taxation of the Kingdom of Cambodia.
  13. **Suspension and/or Revocation of Exploration License and/or Mining License** – are subject to violation of the provisions of the Law on Management and Exploitation of Mineral Resources. The period of suspension shall not be over six (06) months.
  14. **Termination of Agreement** - Where the exploration license and/or mining license were revoked, this Agreement shall be terminated.
  15. **Settlement of Disputes** - shall be made under the laws of the Kingdom of Cambodia.

References:

1. Law on Management and Exploitation of Mineral Resources, promulgated on 13 July 2001
2. Law on Taxation, promulgated on 1997.
3. Sub-Decree on the Determination of Principles of Investments in Mineral Resources, No 08, dated 31 January 2005.
4. Sub-Decree No 113 Dated 29 September 2005 on the Amendment of Article 1 of the Sub-Decree No 08, dated 31 January 2005 on the Determination of Principles of Investments in Mineral Resources.
5. Regulation No 340 dated 25 May 2004 on registration and procedures for applying for mineral licenses, renewal of mineral license and transfer right.
6. Model Agreement on Mineral Exploration and Exploitation, made by the General Department of Mineral Resources, Ministry of Industry, Mines and Energy of Cambodia.

**THE ROYAL GOVERNMENT OF CAMBODIA**  
**MINISTRY OF INDUSTRY, MINES AND ENERGY**

**CAMBODIA POWER SECTOR STRATEGY**  
**1999-2016**

January 1999

# Cambodia Power Sector Strategy 1999 - 2016

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# **CAMBODIA POWER SECTOR STRATEGY**

## **1 - Introduction**

Cambodia's power sector was severely damaged by years of war and neglect. Only 15% of households have access to electricity. Cambodia's public electricity supplies at present comprise 24 small isolated power systems, which serve Phnom Penh and the capital towns of the provinces. The largest system is in Phnom Penh, which has a population of around 1 million and 103,000 customers. The system in Phnom Penh has a peak demand of 70MW and a power generation capacity of 110MW, out of which 50MW is provided by one IPP and another short term IPP. A second IPP is scheduled to come on line by year 2001 to provide an additional capacity of 60MW. The total installed capacity for provincial capitals are estimated 37MW with sizes range from 300kW to 5MW.

As a result of the small size of generation units, dependence on oil-based generation and large losses in distribution, the unit cost of electricity is the highest in the region.

## **2 - Power Sector Development Policy**

The Royal Government of Cambodia formulated an energy sector development policy in October 1994; its objectives are:

- To provide an adequate supply of energy throughout Cambodia at reasonable and affordable price,
- To ensure a reliable, secure electricity supply at prices, which facilitate investment in Cambodia and development of the national economy,
- To encourage exploration and environmentally and socially acceptable development of energy resources needed for supply to all sectors of the Cambodian economy,
- To encourage efficient use of energy and to minimize detrimental environmental effects resulting from energy supply and use.

## **3 - Sector Reforms and Rehabilitation of Power Sector**

To achieve the above objectives, the government has undertaken sector reform measures and rehabilitation of the power sector with the support of multilateral and bilateral agencies which aims at:

- Re-establish an adequate supply of electricity Nationwide through direct support of donors and private participation in generation,
- Strengthen sector managerial and implementing capability,
- Create the environment required for sustained and efficient development of the power sector, open to competition and private participation,
- Extending its power sector objectives to Rural Areas.

Sector reform and rehabilitation of the power sector have been in progress since 1994. With the rehabilitation work undertaken, the power supply in Phnom Penh and Sihanoukville has improved considerably. Rehabilitation of the distribution network in Phnom Penh, Siem Reap and Sihanoukville was completed in 1999. The reviewing study of electrification of provincial towns under ADB assistance has been completed and a Power Transmission Master Plan of Cambodia and Rural Electrification Strategy under World Bank sponsorship.

Under Sector Reform measures, (i) Electricité Du Cambodge (EDC) a wholly state-owned limited liability company has been established to generate, transmit and distribute electricity throughout Cambodia. (ii) an



Electricity Law that was promogated and EAS also established. The responsibilities of EAC is to issue the licenses to electrical utilities for generation, transmission and distribution and to create favorable conditions for capital investments in and the commercial operation of the electric power industry.

#### **4 - Objectives of the Cambodian Power Sector Strategy**

Cambodia faces a major challenge to develop an adequate and reliable source of electric power in the years ahead. Based on intensive studies of the best means of providing a national electricity supply network, the Royal Government has developed a long-term power sector strategy for Cambodia to meet the growing demand for electric power over the next 20 years. The strategy establishes the sector's policy and action plans for:

- Investment in the power sector,
- Priorities for generation and transmission,
- Establishment of the power sector's Regulatory Framework,
- Commercialization of EDC,
- Private sector participation,
- Provincial and Rural Electrification.

#### **5 - Investment Strategy in the Power Sector**

The huge growth in power supply and infrastructure requirements is not affordable by the Government. Hence the Royal Government has decided to encourage and create the conditions to attract private sector investment in the power industry. The objectives of private sector investment are: (i) to speed-up the rehabilitation of power sector, (ii) to mobilize capital that may not be available from multilateral lending Agencies, (iii) to reduce the public sector debt, (iv) to increase the efficiency of existing power utilities through increased competition and transfer of technology and skill.

The Royal Government will also continue to seek financial assistance from multilateral and bilateral lending Agencies for energy infrastructure development to be undertaken by state- owned corporations. Such borrowings will most likely be for electricity transmission and distribution, hydro-electricity generation, and also provincial and rural electrification.

#### **6 - Priorities for Generation and Transmission**

Load forecast of electricity generation in Cambodia is expected to face a significant increase in demand over the next 20 years. Electricity demand in Cambodia is forecast to grow from 97MW and 522GWh in 1998 to 746MW and 2634GWh in 2016. While the majority of this growth will occur in Phnom Penh, there will be significant growth in provincial towns. Further details of the estimated generation output required to meet electricity demand growth are given in Table 1.

To meet this growth in demand, the Royal Government has decided to develop a National Transmission System. This System will allow access to energy generated by efficient large-scale power stations to provincial centers and also allows Cambodia to access available hydroelectric sites. It will significantly reduce reliance on imported oil for the energy generation and also the risks involved in transportation of oil. The Transmission System will require a major investment program and will be developed over many years; initial priorities will concentrate on the development of the first stage of the transmission system, the rehabilitation of local generation and expansion of the distribution system of provincial towns.

The Transmission System of Cambodia consists of (i) a Generation Master Plan and, (ii) a Transmission Master Plan. A Schematic Diagram of the Generation and Transmission Plan together

with the dates for commissioning of generation units is given in Figure 1. In relation to the transmission system and location of hydro plants, a map of Cambodia is given in Map 1.

## **6 - 1 - Generation Master Plan**

The Generation Master Plan has been developed on the following criteria:

- Base load thermal generation will be located in Sihanoukville to give independent access to imported oil and thereby reducing the amount of oil transported on the Mekong,
- Peak load thermal generation in Phnom Penh,
- Small and medium size diesel units for base and peak load generation in the provincial towns and cities,
- Hydro development based initially on the smaller easily accessible sites such as Kirirom, and Kamchay and subsequently mid size hydro projects: Stung Atay and Middle Stung Russei Chrum and also the two Battambang hydro sites.

The generation expansion projects have been prioritized as follows:

### **Stage 1- (5 years 1999-2003)**

- Private developers to establish a 60MW generating plant (IPP2) in Phnom Penh with a commissioning date of December 2001.
- To rehabilitate/construct Kirirom and Kamchay hydro projects, which is accessible, located reasonably close to load centers, and for which feasibility study results indicate good financial return.  
  
(low capacity transmission links (115kV) from Aranyaprathet (Thailand) to Bantey Meanchey, Battambang and Siem Reap, and connection from Vietnam to Takeo,  
  
large capacity transmission lines (230kV or 500kV) dedicated to energy imports/exports with the first interconnection with Vietnam. The date of this first connection is dependent on negotiations but tentatively planned to take place between 2003 and 2008. **Move from 6-5 of page 8)**

The cost of generation development associated with stage 1 projects is estimated at \$M150.

### **Stage 2 - (5 years 2004-2008)**

- Carry out the feasibility studies commencing in 2001 of Battambang 1 & 2 hydro projects;
- Carry out detailed feasibility studies commencing in 2001 for key hydro projects identified by the least cost scenario including Kamchay 47-125MW (possible commissioning date 2008 if viable) and other hydro power stations including Stung Atay.  
Carry out feasibility studies of export oriented power schemes such as Stung Mateuk (Mnam)2.
- Carry out feasibility studies for other hydro projects identified by the least cost scenario, Lower and Middle Stung Russei Chrum for commissioning in Stage 3 and also Sambor identified in the preferred development plan for commissioning after the year 2016.
- Commence feasibility studies of large export oriented hydro schemes.

The cost of generation development associated with stage 2 projects is estimated at \$M219 to \$M410. The \$M219 estimate includes the Kamchay site 1 (47MW) whereas the \$M410 includes the Kamchay site 2 (125MW).

### **Stage 3 (8 years 2009 - 2016)**

- Development of 110MW Stung Atay hydro station by 2012.
- Development of 90MW gas turbine at Sihanoukville.
- Development of 125MW Russei Chrum hydro power station by 2016.

The cost of generation development associated with stage 3 projects is estimated at \$M604.

## **6 - 2 - Transmission Master Plan**

The transmission master plan has been developed taking into account the following strategies to achieve Cambodia's electricity sector objectives:

- reduce reliance on imported oil for energy generation (diversification of energy sources),
- reduce reliance on the transport of oil to Phnom Penh for power generation,
- reduce reliance on oil transport on the Mekong River through Vietnam to Phnom Penh,
- increase operational efficiency of the system (minimize losses),
- encourage least cost development of provincial load centers by a cost effective mix of grid expansion and local private generation,
- increase competition in power generation by providing access to competitive sources of imported electricity from Vietnam, Thailand or Laos,
- maintain the reliability of power supply at the level required and financially supported by customers,
- facilitate export of electricity.

The transmission system is proposed to be developed in three stages depending on the availability of the funds as follows:

### **Stage 1 - (5 years 1999-2003)**

The first stage of the Transmission Master Plan covers the period between the present and year 2005. The scope of work includes implementation of the following projects:

- Year 2001: 230km of double circuit 230kV transmission between WS and Sihanoukville and a 20km 115kV connection from WS to GS2 including terminal switchyards at WS, Takeo, Kampot and Sihanoukville.
- Year 2002: stringing of the second 115kV circuit between GS2 and GS3.
- Year 2001 2003: continuation of the 115kV connection project from Thailand to Banteay Meanchey to Battambang and Siem Reap terminals.
- Stringing of the second 115kV circuit between GS1 and GS3.
- Year 2000-2002: 130km single circuit 115kV, connection between Kirirom hydro power station (11MW) and GS3 including 115/22kV switchyard at Kompong Speu.
- Year 2003: initial development of the western grid with the 50km, single circuit 115kV connection from Thailand to Banteay Meanchey and a 115/22kV, terminal substation at Banteay Meanchey.

The cost of transmission developments associated with stage 1 is estimated at \$M143

### **Stage 2 - (5 years 2004-2008)**

The second stage of the development covers the period between the years 2004 and 2008. The scope of work includes implementations of the following projects:

- Year 2008: 100km single circuit 115kv transmission line from North Phnom Penh to Kompong Cham including a substation at Kompong Cham.
- Year 2007: establishment of a 115/22kV terminal substation at Phnom Penh (NPP) and stringing a second 20 km 115kV transmission circuit between GS1 and NPP.
- Year 2008: 20km double circuit 230kV transmission between Kamchay and Kampot substation and 110km 115kV.

- Year 2004: 230kV interconnection between Vietnam and Takeo, 15km single circuit 115kV transmission from NPP to East Phnom Penh including a 115/22kV substation at East Phnom Penh (EPP).

The cost of transmission developments associated with stage 2 is estimated at \$M43.

### **Stage 3 - (8 years 2009-2016)**

The scope of work includes implementation of the following projects:

- Year 2011: 20 km single circuit 230kV transmission from WS to South Phnom Penh (SPP) and a terminal substation in SPP.
- Year 2011: single circuit 115kV transmission line between Battambang 2, hydro station and Battambang substation.
- Year 2012: 260km double circuit 230 kV transmission line between North Phnom Penh and Kompong Chhnang including switchyard at North Phnom Penh and intermediate 230kV switching station at Pursat.
- Year 2012: 50km single circuit 115kV transmission line from East Phnom Penh to Prey Veng and 115/22kV terminal substation at Prey Veng.
- Year 2013: 20km 230kV transmission from North Phnom Penh to West Phnom Penh. including a single circuit between West Phnom Penh and South Phnom Penh and a 115kV transmission between West Phnom Penh and GS3.
- Year 2014: connection of IPP5, 90MW gas turbines to Sihanoukville switchyard.
- Year 2015: 115kV u/g cable connection single circuit from IPP2 to Central Phnom Penh including a terminal substation at Central Phnom Penh.
- Year 2016: double circuit 230kV transmission line from Stung Atay to Middle Stung Russei Chrum (125MW).
- Year 2016: 230kV switching station at Kompong Chhnang and a terminal substation.
- Year 2016: 110km double circuit 230kV transmission line from Pursat to Battambang including switchyard at Battambang.

The cost of transmission developments associated with the stage 3 is estimated at \$M177.

The total capital cost of transmission developments within the period from 1999 to 2016 is about \$M365 excluding contingencies.

### **6 - 3 - Provincial Towns' Electrification Plan**

Formerly the power utilities in the Cambodian provinces were managed and controlled by the Ministry of Industry, Mines and Energy. A Royal Decree in March 1996 gave Electricité du Cambodge (EDC) the responsibility for generation, transmission and distribution in whole of Cambodia. With the re-organisation of the power sector, the electrical utilities of three provincial capitals have already been taken over by EDC. The remaining power utilities of the other provinces will be transferred to EDC in due course.

Already a study for the electrification of 8 provincial capitals has been completed under ADB technical assistance. It is estimated that USM\$24 would be required to rehabilitate the power sector in these eight provincial capitals. The Royal Government is seeking the funding from the ADB for this new project.

As regards the rehabilitation of the other provinces, it is planned to seek concessional funds. Private sector participation will also be encouraged, including partnership with the private sector that includes concessional finance.

It is estimated that \$M90 will be required over the period 1999-2005 to rehabilitate the generation and distribution systems in provincial centres.

#### **6 - 4 - Rural Electrification**

Ninety percent of the population of Cambodia is located in rural areas and do not have access to electricity. The provision of rural energy is a key factor in the rehabilitation and development of Cambodia. Electricity is very important for the improvement of living standards, and an important infrastructure requirement for agricultural and small-scale industrial development in rural areas

##### **6 - 4 - 1 - Rural Electrification Strategy**

The Royal Government has formulated a rural electrification strategy to provide the best supply option for rural areas. Rural electrification schemes will be selected on the basis of the following criteria to ensure equity in access to supplies:

(i) balanced development in the provinces at different levels of economic growth, (ii) choice of the scheme having the highest cost/benefit ratio and economic rate of return, (iii) to provide electricity to a certain amount of villages in each province.

##### **6 - 4 - 2 - Institutional Framework**

MIME is responsible for (i) strategy, (ii) planning, (iii) resources and, (iv) monitoring the rural electrification process throughout Cambodia.

Since the capital investment in rural electrification has a very low rate of return, private participation in this field may be limited. The Royal Government has decided to seek grants or soft loans from multilateral and bilateral agencies for rural electrification works. It is estimated that \$M10 per year will be required over a 10-year period. Rural electricity cooperatives will be established to provide power until electric supply becomes economically justifiable. The cooperatives will be responsible for the construction, operation and management, including the revenue collection. Single wire distribution lines should be considered (SWER),

along with diesel plants. However, for the isolated villages, electrification based on micro-hydro, solar or indigenous resources will also be considered.

MIME will establish a Rural Electrification Cell to assist in the establishment of rural electricity cooperatives and with access to investment credit. It will provide technical and management support to assist in implementing projects in cooperation with rural communities to demonstrate the feasibility of self-management and financial sustainability of rural electric cooperatives. The Rural Electrification Cell will have representatives in the Provinces that are well trained on the technical and financial aspects of rural electrification.

Rural electrification demonstration projects will also be implemented by EDC in the provinces for which it has responsibility and it will also encourage rural electrification cooperatives. EDC's Provincial Managers reporting to the Managing Director will be responsible for the implementation of rural electrification projects.

##### **6 - 4 - 3 - Pilot Program for Rural Electrification**

A pilot project for Ramdoul has been selected and designed on the basis of the above strategy.

The project consists of supplying the Ramdoul district a SWER system. This involves the establishment of a 600 kVA-diesel station and transformer and construction of 72 km of SWER lines and 21 single-phase SWER distribution transformers.

The cost of the project is estimated at US\$628,000.

The cost of rural electrification development for Stage 1 projects (5 years 1999-2003) is estimated at \$M50.

## **6 - 5 - Electricity Trading with Neighboring Countries**

To improve system reliability and to reduce electricity costs, trading arrangements with neighboring countries will be negotiated, namely:

- low level energy purchases (22kV) to provide power to provincial towns and districts close to the borders with Vietnam, Thailand and Laos,

## **7 - Establishment of Power Sector Regulatory Framework**

The Royal Government announced, through Royal Decree on March 9, 1996, a decision to establish an Independent Regulatory Agency to improve the efficiency and the availability of electric power services in Cambodia by increased private ownership and competition in generation of electric power.

### **7 - 1 - Electricity Law**

Electricity Law was promulgated in 02 February 2001.

The Law creates the Electricity Authority of Cambodia as an independent regulatory authority and also establish:

- (i) the principles for operations in the electric power industry, the activities of licensees in the provision of electric power services,
- (ii) favorable conditions for capital investments in and the commercial operation of the electric power industry,
- (iii) the basis for the regulation of supply of electric power services to the extent such services are monopolistic, and,
- (iv) the basis for the protection of the rights of consumers in the short term and in the future.

### **7 - 2 - Establishment of Electricity Authority of Cambodia (EAC)**

EAC is scheduled to be fully operational in mid 2001. From this time it will be responsible for approving all tariffs and charges for the supply of electricity. The Authority will regularly review the tariffs and charges to ensure they provide electricity at reasonable prices consistent with ensuring an adequate return to investors in the supply of electricity. EAC will be responsible for regulation of both private and public suppliers of electricity including Electricité du Cambodge.

## **8 – Commercialization of the Supply of Electricity**

The Government is committed to ensuring that all electricity supply is undertaken on a sound commercial basis. This will contribute to the effective utilization of capital investment and a customer focussed electricity supply service.

## **8 – 1 - Commercialization of EDC and Marketing Strategy**

EDC has functioned as an autonomous commercial legal entity since August 1997. The EDC Board is in place and conducts regular monthly Board meetings. Corporate objectives, annual budget and performance plans for the year 2000 have been established. A new tariff has been approved in 01 September 2000 by the Ministry of Economic and Finance and Ministry of Industry, Mines and Energy.

The EDC Board has decided to give an immediate priority to addressing commercial and financial issues. The main challenge for EDC is now therefore:

- to set up a suitable organizational structure for the management of more than 103,000 customers in Phnom Penh and Kandal province,
- to appoint and train staff (in progress),
- to appoint a Marketing team (completed),
- to strongly develop its sales of electricity,
- to focus on a Customer-oriented process.

The World Bank has recommended entering into a contract with foreign Utility to assist in turning EDC into a profitable Utility. EDC is in favor of having a consultant team to assist them in the fields of Customer Management, Marketing and Sales Development and is seeking the assistance of the French Government.

To develop senior staff skills in commercial management best practice, EDC and MIME senior staff and executive Directors are participating in a year long training program concerning: Financial Management and Planning, Business Management, Strategic Planning and Project Financial Appraisal and Economics. The training program was conducted by the National Institute of Management and sponsored by the World Bank.

## **8 - 2 - Commercialization of Provincial Electricity Supplies**

In January 1999 senior staff of provincial electricity supply units commenced training in Business Management. This is the first stage of a program to implement a sound commercial management structure for provincial electricity supplies. A development grant will be sought to implement a structural reform program in all provinces. This program will establish commercial structures for management of electricity supplies and performance contracts for the management of all provincial supply networks. A separate Provincial Electricity Office will be formed at the national level to monitor performance and provide support to provincial offices.

## **9 - Private Sector Participation in Power Projects**

### **9 - 1 - Experience Gained From the Past Five Years**

The Royal Government policy during the last past years was dictated by the desperate situation of the Cambodian electricity sector in 1993. The huge growth in power supply and infrastructure requirements was not affordable by the Government. Hence, the Royal Government decided to encourage and create the conditions to attract private sector investment in the power industry.

It was an absolute necessity to supply a minimum of electric power in many places just to meet with the most urgent needs of the country. Government therefore had accepted proposals from investors who approached with turnkey projects. Accordingly, four Power Purchase Agreements were signed to meet the country's urgent power demand.

The situation of Cambodia has significantly improved. The country is considered by private investors as safer and promising. Security has improved, laws have been promulgated in many fields, especially regarding

investments and the democratic frame is stronger. Major positive signals have been delivered such as the award of MFN status to the Kingdom and the introduction in ASEAN in view of a full membership.

The risk for investors is perceived as lower and consequently investors are ready to implement projects profitable on a longer term, i.e. with lower internal rate of return on assets.

It is now logical to reconsider the mode of involvement of private investors, and to proceed through international competitive bidding for any significant project like in neighboring countries.

## **9 - 2 - Private Sector Participation Policies**

The Royal Government will follow a new approach for the development and approval of private investment projects in the power sector in Cambodia:

(i) competitive tendering will be used for all significant power project, (ii) the selection process of IPP developers will be transparent and competitive, (iii) to include termination clause in PPAs for a possible transfer to EDC providing the utility is able to supply at lower cost through the national grid to be

established, (iv) to introduce a two-part tariff for the purchase of electricity from IPPs, and (v) all private sector funding and ownership of significant power projects will be evaluated against public funding and ownership and joint ventures between the public and private sector.

Guidelines on private investment and procedures for negotiating PPAs are being reviewed and updated in line with these policies of the Royal Government.

## **10 - Environmental Policy and Legislation in Cambodia**

The Environmental Protection and Natural Resources Law, 1996, provides for all projects to be subject to environmental impact assessment (EIA) procedures with the procedures to be determined by Sub-Decree. The Sub-Decree presently under review provides for the Ministry of Environment to establish an Environmental Steering Committee and EIA Project Review Teams (PRTs) for different sectors. MIME and EDC will participate in both the Steering Committee and also the relevant PRT.

Sound and environmental management for the power projects requires a systematic approach for protection against pollution of air, soil and water, protection against noise, vibration and radiation, protection of flora and fauna in relation to power sector operations. EIA will be integrated into the development of power projects.

Table I

### **Expected Generation Output for Cambodia (MW) - Base Case**



<b>YEAR</b>	<b>1998</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2006</b>	<b>2008</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>
Banteay Meanchey	4.0	5.9	8.0	10.0	12.0	14.5	17.3	20	24	26
Battambang	3.5	5.7	8.6	12.0	15.0	18.5	22.4	27	31	33
Kampong Cham	4.9	7.8	10.5	13.0	15.2	17.9	20.5	23	26	29
Kampong Chnang	1.1	1.6	2.2	2.8	3.4	4.0	4.7	5	6	7
Kampong Speu	1.0	2.0	2.9	3.8	4.7	5.9	7.2	9	12	16
Kampong Thom	1.5	2.4	3.4	4.5	5.3	6.4	7.5	9	10	11
Kampot	2.7	4.8	8.1	10.1	13.9	16.3	18.9	25	28	33
Kandal	2.2	3.9	5.5	6.7	7.9	9.2	10.6	12	13	15
Koh Kong	0.7	0.9	1.2	1.4	1.7	2.0	2.3	3	3	4
Kratie	1.9	3.2	4.4	5.7	6.8	8.0	9.4	11	12	14
Mondul Kiri	0.1	0.2	0.3	0.4	0.5	0.6	0.7	1	1	1
Phnom Penh	60	93	131	170	207	256	304	356	418	484
Preah Vihear	0.3	0.5	0.7	1.0	1.1	1.4	1.6	2	2	2
Prey Veng	1.7	3.0	4.4	5.5	6.6	7.8	9.0	10	11	13
Pursat	1.3	2.3	3.2	4.2	5.0	5.9	6.9	8	9	11
Ratanak Kiri	0.9	1.1	1.3	1.5	1.7	1.9	2.2	2	3	3
Siem Reap	3.0	4.2	5.6	7.1	8.4	10.0	11.5	13	15	17
Sihanoukville	2.9	3.4	4.1	4.8	5.5	6.3	7.3	8	10	11
Stung Treng	0.2	0.5	0.7	0.9	1.1	1.3	1.5	2	2	2
Svay Rieng	1.0	1.6	2.2	2.8	3.2	3.9	4.4	5	6	6
Takeo	1.5	2.4	3.4	4.2	4.9	5.8	6.7	8	8	9
Pailin	0.1	0.2	0.3	0.4	0.5	0.6	0.7	1	1	1
Oddar Meanchey	0.1	0.1	-	-	-	-	-	-	-	-
Kep	0.1	0.2	0.3	0.4	0.5	0.6	0.7	1	1	1
<b>TOTAL</b>										

Table 1

### Expected Generation Output for Cambodia (GWh) - Base Case

<b>YEAR</b>	<b>1998</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2006</b>	<b>2008</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>
Banteay Meanchey	24.8	24.8	28.1	32.7	37.6	43.8	51.2	59.9	70.1	77.8
Battambang	22.5	28.8	36.0	43.5	50.6	59.6	69.8	81.5	95.1	102.0
Kampong Cham	28.8	34.0	39.3	44.8	50.3	58.1	65.3	73.1	82.9	92.9
Kampong Chhnang	5.1	6.1	7.3	8.3	9.5	11.0	12.6	14.4	16.4	18.2
Kampong Speu	8.0	9.4	11.0	12.7	14.3	16.8	19.6	23.4	29.6	38.8
Kampong Thom	7.4	9.1	11.1	13.3	15.1	17.5	20.3	23.5	27.0	30.9
Kampot	13.7	16.9	22.7	26.3	34.3	39.2	45.2	52.1	59.5	68.4
Kandal	16.0	21.0	27.5	34.0	41.1	49.6	60.0	69.9	82.1	95.6
Koh Kong	4.6	5.5	6.5	7.5	8.8	10.1	11.5	13.1	14.9	17.3
Kratie	8.7	11.2	14.3	17.6	20.7	24.3	28.4	33.1	38.4	44.6
Mondul Kiri	0.6	0.7	1.0	1.3	1.4	1.7	1.9	2.1	2.8	3.1
Phnom Penh	321	438	566	695	820	994	1168	1355	1584	1829
Preah Vihear	1.5	1.9	2.4	2.8	3.2	3.9	4.4	5.0	6.0	6.6
Prey Veng	10.6	12.4	14.5	16.3	18.2	20.8	23.7	26.7	30.0	33.5
Pursat	7.2	8.9	11.0	13.2	15.4	17.9	20.7	23.9	27.6	31.8
Ratanak Kiri	3.5	3.6	4.2	4.4	4.8	5.6	6.0	7.0	7.7	8.9
Siem Reap	12.5	15.2	18.2	21.1	23.9	27.5	31.4	36.2	41.4	47.3
Sihanoukville	10.2	11.9	14.0	16.2	18.3	20.8	23.7	27.0	30.8	35.4
Stung Treng	1.2	1.4	1.7	2.0	2.6	3.0	3.4	3.9	4.5	5.6
Svay Rieng	5.6	6.3	7.3	8.1	8.8	10.1	11.1	12.3	14.0	15.4
Takeo	8.6	10.4	12.3	14.2	16.2	18.4	21.6	24.6	27.4	31.6
Pailin	0.5	0.6	0.9	1.2	1.3	1.6	1.8	2	2.7	3
Oddar Meanchey	?									
Kep	0.4	0.5	0.7	1	1.1	1.5	1.6	1.8	2	3
<b>TOTAL</b>										



**KINGDOM OF CAMBODIA**  
**Nation Religion King**

**Law on Taxation**

*This law is adopted by the National Assembly of the Kingdom of Cambodia on January 8, 1997 at the 7th session of the 1st legislature.*

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## **CHAPTER 1: PROVISIONS FOR THE TAX ON PROFIT**

**Section 1: General Provisions****ARTICLE 1: CHANGE TO TAX**

The provisions for the tax on profit as stated in the Finance Act of 1994 promulgated by the Royal Kram No. 02NS dated 28 December 1993, the Amendment to the Finance Act of 1994 promulgated by the Royal Kram No. 08NS dated 30 November 1994, the Finance Act of 1995 promulgated by Royal Kram No. 11NS94 dated 31 December 1994, and the Amendment to the Finance Act of 1995 promulgated by Royal Kram No. CS/RKM/0995/01 dated 01 September 1995 shall be amended as follows for the benefit of the State budget.

**ARTICLE 2: OBJECT OF THE TAX**

The tax of profits is the debt of a resident person on income from Cambodian sources and income from foreign sources and of a non-resident person on income from Cambodian sources.

**ARTICLE 3: DEFINITIONS**

For the purposes of the tax provisions:

1. The term “resident taxpayer” means:
  - a. any physical person who is domiciled in or has a principal place of abode in, the Kingdom of Cambodia, or who is present in the Kingdom of Cambodia on more than 182 days during the calendar year;
  - b. any legal person or pass-through organized or managed in the Kingdom of Cambodia, or having its principal place of business in the Kingdom of Cambodia. A permanent establishment shall be considered a resident legal person with respect to its Cambodian source income only.
2. The term “non-resident” means not a resident of Cambodia.
3. The term “legal person” means any enterprise or organization carrying on a business whether or not officially recognized by the competent institutions of the Royal Government. The term “legal person” includes any government institution, religious organization, charitable organization, or non-profit organization. For a non-resident person, the term “legal person” means any permanent establishment in the Kingdom of Cambodia. The term “legal person” does not include a pass-through or a sole proprietorship.
4. The term “permanent establishment” means a fixed place of business in the Kingdom of Cambodia, the branch of a foreign company or an agent resident in the Kingdom of Cambodia, through which the non-resident person carries on their business. The term “permanent establishment” also includes any other association or connection through which a non-resident person engages in economic activity in the Kingdom of Cambodia.
5. The term “pass-through” means a general partnership with up to 10 resident individual partners in which the proportional sharing by the partners of items of capital, profit, and loss meet the criteria which shall be determined by sub-decree. In this definition, a “pass-through” cannot be a member of another partnership and does not include a corporation, a permanent establishment, or a sole proprietorship.
6. The term “sole proprietorship” means a business enterprise owned 100 percent by one physical person. In this definition, a husband and wife and their dependent children shall be treated as one physical person.
7. The term “business” means a person’s economic activity the aim of which is to derive income from the production and sale of goods, the supply of services, the lease, rental or sale of property, or any other activity.
8. The term “dividend” means any distribution of money or property that a legal person distributes to a shareholder with respect to the shareholder’s equity interest in such legal person, with the exception of stock dividends and distributions in complete liquidation of the company. Whether or not a distribution is a dividend shall be determined under the preceding condition without regard to whether or not the legal person has current or accumulated income or profits or

earnings.

9. The term “shareholder” means any person owning an equity interest in a legal person. For the purposes of this tax a legal person which is not a corporation shall be treated as if it were a corporation and any person who holds an equity interest in, or may otherwise gain income or profit as a participant in such a legal person shall be treated as a shareholder of such legal person.
10. The term “investment enterprise” means an enterprise that the Council for the Development of Cambodia has recognized as an investment enterprise and that has registered with the tax administration.
11. The term “related person” means:
  - a. a member of the taxpayer’s family;

- b. an enterprise which controls or is controlled by, or is under common control with, the taxpayer. The term "Control" means the ownership of 51 percent or more in the value or voting power of the equity interests in the enterprise. For determining the degree of control of a taxpayer who is a physical person, shall be taken into consideration all equity interest owned by the taxpayer and those owned directly or indirectly by the taxpayer's spouse.

#### **ARTICLE 4: TAX REGIMES**

The tax regimes are as follows:

1. The assessment of the tax on profit shall be made according to the real regime, simplified regime, or estimated regime system of taxation.
2. The rules and procedures for the assignment of taxpayers to one of the three regimes as above will be determined by sub-decree and shall be based on the form of the business, the type of business activity, and the level of turnover.

#### **SECTION 2: TAXABLE PROFIT AND TAX RATES**

##### **ARTICLE 5: TAX YEAR**

The tax year shall be determined as follows:

1. The tax on profit for the real regime system of taxation is calculated from the balance sheet results realized in the previous tax year.
2. If there is no closing balance sheet during any one year the tax to be paid for the following year is assessed on the profit made in the previous period from the end of the last taxable period. For new enterprises the calculation is made from the start of business operations up to the 31st of December of the year for which the tax is calculated.
3. If many successive balance sheets are drawn up during the same year the results of these balance sheets are added up to have the base for the tax to be paid.
4. The tax on profit for the simplified and estimate regime systems of taxation shall be calculated on a cash method of accounting on the past calendar year.
5. Directives on the reporting and the filing of a final declaration for enterprises that cease activities, are reorganized, or are sold or transferred during the calendar year shall be determined by prakas of the Ministry of Economy and Finance.

##### **ARTICLE 6: ACCOUNTING RULES**

Accounting rules shall be determined as follows:

1. For a taxpayer under the simplified regime system of taxation using cash method of accounting, income is reported in the year that cash or other property is actually received even if as payment pertaining to other years, and expenses or deductions are taken in the year in which the expenses or other items are actually paid except for prepaid expenses and depreciation allowances.
2. For a taxpayer under the real regime system of taxation using the General Chart of Accounts method of accounting, income is reported in the year it is earned whether that income is already paid or not. The deduction for an expense may be taken when all facts determining the taxpayer's liability have occurred, the results of economic activities with respect to the item has occurred, and the amount of the taxpayer's liability can be actually determined.
3. For real regime taxpayers, expenses incurred to a related person under the simplified regime system of taxation is not allowed as a deduction before actual payment.
4. Domestic banks and savings institutions shall be allowed to establish provisions for bad debts for the determination of the taxable profit. The rules and procedures on deductions shall be provided by sub-decree.



**ARTICLE 7: TAXABLE PROFIT**

The taxable profit is the net profit obtained from all the results of all types of operations realized by the enterprise including capital gains from the sale of various parts of the asset during the operation or at the close of the business, as well as income from financial or investment operations and interest, rental, and royalty income.

**ARTICLE 8: DETERMINATION OF TAXABLE PROFIT**

The taxable profit is made up of the excess gross product realized on the expenditure that is made with the view of acquiring and preserving profit.

**ARTICLE 9: INCOME EXEMPT FROM TAX**

Income exempt from tax shall be as follows:

1. Except for contrary provisions and for income that is taxable under article 22 of this law the tax on profits shall not apply to:
  - a. the income of the Royal Government and institutions of the Royal Government;
  - b. the income of any organization that are:
    - organized and operated exclusively for religious, charitable, scientific, literary, or educational purposes;
    - no part of the assets or earnings of which is used for any private interest;
  - c. the income of any labor organization, or any chamber of commerce, industry, or agriculture, in the case where the income of these organizations is not used for the private benefit of any shareholder or physical person.
  - d. The profit from the sale of agricultural produce that a person who is not a real regime system of taxation taxpayer has produced by himself whether the produce is sold in its raw state or after transformations that are an extension of habitual agricultural work. Operations by industrial means including transformation, preservation, and commercial packaging are not considered part of habitual agricultural work.
2. The Ministry of Economy and Finance shall define by prakas the procedures for the application for tax exemptions, the loss of tax exemptions, for tax declarations, and for registration.

**ARTICLE 10: DETERMINATION OF INCOME OF A PASS-THROUGH**

The income of a pass-through shall be determined as follows:

1. With regard to a pass-through, each member in determining one's income for a taxable year shall take into account separately one's distributive share of the items of income, gain, loss, deduction, credit, and charitable contributions for such year. For this purpose each item shall retain its character and shall be treated as distributed during the taxable year whether or not actually distributed. The loss to be carried forward will be determined after the items have been distributed.
2. The rules for determining the amount distributed, the treatment of contributions, and the adjustment to each member's base distributive share in the pass-through in any taxable year shall be determined by sub-decree.

**SECTION 3: DEDUCTIONS****ARTICLE 11: ALLOWABLE DEDUCTIONS**

Allowable deductions shall be as follows:

1. Except as provided in articles 12 through 18 of this law, expenses that are allowed as a deduction include expenses that the taxpayer has paid or incurred during the tax year to carry on a business.
2. Any rent, interest, compensation, payments, or fees paid to an officer or director

of an enterprise, a partner, a member of a pass-through, a member of the taxpayer's family or other related person where there is proof that the payment is for services actually performed and to the extent that such payment is reasonable.

3. Amounts paid on new buildings and other tangible assets, permanent improvements or betterments including any construction or acquisition period interest and taxes. These amounts are to be recorded in the relevant asset account and shall be deductible as depreciation as provided in article 13 of this law.

#### **ARTICLE 12: INTEREST EXPENSE**

There shall be allowed as a deduction interest expenses paid or incurred by the taxpayer during the tax year to carry on a business but not in excess of an amount equal to the sum of the taxpayer's interest income and 50 percent of the taxpayer's net noninterest income in the tax year.

The "net noninterest income" is the gross income other than interest income, reduced by the allowable expenses except for interest expense.

Any interest expense remaining from the above mentioned deduction shall be treated as an interest expense for the next tax year and the deduction shall be made according to the content of this same article.

#### **ARTICLE 13: DEPRECIATION OF TANGIBLE PROPERTY**

Conditions for the depreciation of tangible property are as follows:

1. The allowance for depreciation shall be calculated using the straight-line method or the declining balance method. Depreciable tangible property is tangible property used in a business which is likely to lose value because of use or obsolescence. Land is not depreciable property.
2. All tangible property shall be divided into four categories.
  - a. Category 1 shall include buildings and their basic components. Each asset in this category shall be depreciated according to the straight-line method at a rate of 5 percent per year.
  - b. Category 2 shall include property having a useful life of up to 4 years and have a straight line depreciation rate of 25 percent on each property.
  - c. Category 3 shall include property having a useful life of greater than four years through eight years and have a straight line depreciation rate of 12.5 percent on each property.
  - d. Category 4 shall include all other tangible property and have a straight line depreciation rate of 10 percent on each property.
3. Those taxpayers electing the declining balance method of depreciation shall use a rate of depreciation equal to 200 percent of the straight line method rate and shall apply it to the aggregate remaining undepreciated value of all assets in each category. The declining balance method shall be allowed only for category 2, 3, and 4 property.
4. Enterprises under the Law on Investment shall use the straight line method for all categories.
5. Procedures for establishing property categories, adding a new asset to a category, disposing of an asset from a category, and the treatment of repairs and various expenses shall be determined by sub-decree.
6. A taxpayer subject to the tax on profit prior to 1 January 1997 must make an irrevocable election to depreciate either by the straight line method or the declining balance method the remaining undepreciated value of property by 31 December 1997. For a new taxpayer the election must be made by the 31st of

December of the year of registration.

#### **ARTICLE 14: DEPRECIATION OF INTANGIBLE PROPERTY**

For intangible property including patents, copyrights, drawings, models, and franchises, having a limited life the depreciation rate on each property shall be calculated on the life of that property according to the straight line method of depreciation. If the life of the intangible cannot be determined the annual depreciation deduction shall be at the rate of 10 percent of the value of the intangible property.

#### **ARTICLE 15: DEPLETION OF NATURAL RESOURCES**

Depletion of natural resources shall be determined as follows:

1. The allowance for the depletion of any natural resource, including any oil and gas, shall be determined as follows.
  - a. All exploration and development costs, including interest attributable to these costs, shall be added to the asset account of the resource.
  - b. The amount of the depletion for each natural resource deductible for the tax year shall be determined by multiplying the balance of the account for the natural resource with the ratio of the quantity produced from the natural resource during the year to the estimated total production from the natural resource.
2. Procedures for the determination of the estimated total production shall be provided by sub-decree.

#### **ARTICLE 16: CHARITABLE CONTRIBUTIONS**

A deduction shall be allowed for charitable contributions to an organization as provided in article 9 of this law. But it shall not exceed 5 percent of taxable profit determined before taking the charitable contribution deduction.

The criteria for charitable contributions shall be determined by sub-decree.

#### **ARTICLE 17: CARRY FORWARD OF LOSSES**

In case of a loss in any one tax year, this loss is considered as a charge to the following tax year and shall be deducted from the profit realized in that following year. If this profit is not sufficient to definitively settle it, the remaining part of the loss is carried over successively to following tax years until the fifth tax year.

When losses occur in more than one year, this article shall be applied to the losses in the order in which they arose.

#### **ARTICLE 18: ALLOCATION OF INCOME AND DEDUCTIONS AMONG TAXPAYERS**

In the case of two or more enterprises, whether incorporated or organized in or outside of the Kingdom of Cambodia, which are under common ownership, the tax administration may as may be necessary distribute, gross income, deductions, or other benefits among such enterprises and their owners in order to prevent the avoidance or evasion of taxes or to clearly reflect the income of such enterprises, or their owners.

For purposes of this article, two or more enterprises are under common ownership if a person owns 20 percent or more in the value or the equity interests of each enterprise.

#### **ARTICLE 19: NOT ALLOWED AS DEDUCTIONS**

For the provisions for the Tax on Profit, expenses that shall not be allowed as a deduction are:

1. Any expense on activities generally considered to be amusement, recreation, or entertainment or the use of any means in connection with such an activity.
2. Personal living or family expenses except for fringe benefits in cash or in kind subject to withholding tax according to the provisions for the Tax on Salary,
3. Any tax imposed by the provisions for the Tax on Profit or withholding tax imposed by the provisions for the Tax on Salary.

4. For the loss on any sale or exchange of property, directly or indirectly, between related persons.
5. For any expense except for expenses already incurred and for which the taxpayer can establish the amount of the expense, and the business purpose of the expense in a manner as determined by sub-decree.

#### **SECTION 4: TAX RATES AND TAX DUE**

##### **ARTICLE 20: DETERMINATION OF TAX DUE**

The tax rates on the annual profit are as follows:

1. 20 percent for the profit realized by a legal person.
2. 30 percent for profit realized under an oil or natural gas production sharing contract and the exploitation of natural resources including timber, ore, gold, and precious stones.
3. 9 percent for an investment enterprise after the period of tax exemption.
4. 0 percent for an investment enterprise during the period of tax exemption.
5. According to the progressive tax rate by tranche for the table below for the profit realized by the physical person and the distributive share to each member of a pass-through that is not classified as a legal person.

Parts of the annual taxable profit	Tax rate
From 0 to 6,000,000 Riels	0%
From 6,000,001 to 15,000,000 Riels	5%
From 15,000,001 to 102,000,000 Riels	10%
From 102,000,001 to 150,000,000 Riels	15%
From greater than 150,000,000	20%

##### **ARTICLE 21: TAX ON INSURANCE COMPANIES**

The tax on an insurance company shall be determined as follows:

1. For an enterprise having principal activity in the insurance or reinsurance of life, property, or other risks, the tax on profit shall be determined as follows:
  - a. 5 percent of the gross premiums received in the tax year for the insurance or reinsurance of risk in the Kingdom of Cambodia,
  - b. according to the rates in article 20 of this law for other of activities that are not insurance or reinsurance.
2. The rules and procedures for the payment of the tax on profit for an insurance company shall be determined by prakas of the Ministry of Economy and Finance.

##### **ARTICLE 22: TAX ON UNRELATED BUSINESS PROFIT**

For an unrelated business the tax on profit shall be determined as follows:

1. The tax on profit shall be fixed at 20 percent of taxable income from unrelated business income of organizations as stated in article 9 of this law.
2. For purposes of the tax on profit, the term “unrelated business taxable income” is the gross income realized from an unrelated business regularly carried on by any organization, reduced by the deductions which are directly related to the carrying on of such business and which are allowed by the provisions of tax on profit.
3. The term “unrelated business” means any commercial or industrial business, or any other business of the organization aiming to obtain profit or funds and which are not substantially related to the purpose or function constituting the basis for tax exemption as stated in article 9 of this law.

**ARTICLE 23: ADVANCED TAX ON DIVIDEND DISTRIBUTIONS**

The advanced tax on dividend distributions shall be determined as follows:

1. If an enterprise distributes dividends to its domestic and foreign shareholders during the tax year, it shall withhold and pay as tax an amount equal to the product of the amount of the dividend grossed up by the tax on profit rate and multiplies by the appropriate annual tax rate as stated in article 20 of this law.
2. The above mentioned withheld tax shall become a tax credit against the tax on profit of the dividend distributing enterprise for the tax year in which the withholding takes place. If the tax credit exceeds tax on profit such excess shall be carried forward and shall become a tax credit for the following year. The tax withheld on dividend distributions made by an insurance enterprise taxable under article 21 of this law cannot be used for tax credit.
3. An enterprise (hereinafter called the "first enterprise") owning 20 percent or more in value of the equity in a second enterprise shall establish a dividend account. Whenever the first enterprise receives a dividend on which the tax has been paid from the second enterprise it shall record the amount of that dividend into its dividend account. When the first enterprise subsequently distributes dividends to its shareholders the amount distributed which are taken out of the dividend account shall not be subject to withholding tax under paragraph 1 of this article.
4. A physical person or enterprise receiving a dividend from an enterprise required to withhold tax under paragraph 1 of this article or a dividend from a dividend account described in paragraph 3 of this article shall not include such dividend in income.

**SECTION 5: OTHER TAXES****ARTICLE 24: MINIMUM TAX**

A minimum tax is imposed on taxpayers subject to the real regime system of taxation. The minimum tax is a separate and distinct tax from the tax on profit. This tax is payable by a taxpayer subject to the real regime system of taxation even if the taxpayer has been granted the status of an investment enterprise. The minimum tax is imposed at the rate of 1 percent of the annual turnover inclusive of all taxes and is payable at the time of the annual liquidation of the tax on profit.

The minimum tax may be reduced by the annual tax on profit that is actually paid according to the rules found in articles 37, 38, and 39 of this law.

**SECTION 6: WITHHOLDING TAXES AND PREPAYMENT OF TAX ON PROFIT****ARTICLE 25: GENERAL WITHHOLDING TAX**

The general withholding tax shall be determined as follows:

1. Any resident payor making any payment in cash or in kind to a resident person shall withhold, and pay as tax, an amount according to the below mentioned rates which are applied to the amount paid before withholding the tax:
  - a. The rate of 15 percent on:
    - income received by a physical person from the performance of services including management, consulting, and similar services;
    - royalties for intangibles and interests in minerals, oil or natural gas, and interest paid to a physical person or an enterprise except interest paid to a domestic bank or savings institution.
  - b. The rate of 10 percent on the income from the rental of movable and immovable property.
  - c. The rate of 5 percent on interest paid by a domestic bank or savings institution to a resident physical person having a non-fixed term savings account.
2. The withholding in this article shall not apply to the payment of tax exempt

income as stated in article 9 of this law.

3. For purposes of this article and article 26 of this law, the term “resident payor” means:
  - a. any resident enterprise or pass-through;
  - b. any physical person, but only with respect to payments made by such physical person in carrying on a business in the Kingdom of Cambodia.

**ARTICLE 26: WITHHOLDING ON PAYMENTS TO FOREIGN PERSONS**

A resident payor making any payment of Cambodian source income to a non-resident person shall withhold, and pay as tax, an amount equal to 15 percent of the payment before withholding.

This article shall not apply to dividends as stated in article 23 of this law.

**ARTICLE 27: WITHHOLDING TAX AS FINAL TAX**

The tax withheld on distributions under article 23 of this law, on payments to a resident physical person under article 25 of this law, and on payments to a non-resident person under article 26 of this law shall be considered the final tax on the recipients of the payments or distributions described in those articles.

**ARTICLE 28: PREPAYMENT OF THE TAX ON PROFIT**

An enterprise liable to the tax on profit according to the real regime system of taxation including an investment enterprise liable to the tax on profit at the rate of 9 percent, has the obligation to make a monthly prepayment of the tax on profit at the rate of 1 percent of turnover inclusive of all types of taxes realized in the previous month. This prepayment will be deducted from the tax on profit at the annual liquidation of the tax.

**SECTION 7: OBLIGATIONS OF TAXPAYERS**

**ARTICLE 29: GENERAL OBLIGATIONS OF REAL OR SIMPLIFIED REGIME SYSTEM TAXPAYERS**

Real or simplified regimes system taxpayers have the obligations:

1. All taxpayers liable to the tax on profits who must pay taxes according to the real regime or simplified regime system of taxation shall send every year to the tax administration a declaration of the profit they have realized in the previous tax year. This declaration must absolutely be registered in the period of 3 months after the end of the tax year.
2. Real regime system taxpayers must submit to the tax administration a tax declaration to which is attached:
  - a. Balance sheet
  - b. Results Account
  - c. Tables of complementary information.
3. Simplified regime system taxpayers must submit to the tax administration a tax declaration with attached documents in the form provided by the tax administration.
4. An enterprise with a loss must submit a tax declaration in the same manner and period of time.

**ARTICLE 30: OBLIGATION OF ESTIMATED REGIME SYSTEM TAXPAYERS**

Estimated regime system taxpayers have the obligations:

1. The taxpayer subject to estimated regime system of taxation must submit the tax declaration to the tax administration every year by October 31, in the form provided by the tax administration.
2. The amount of estimated profit is determined by the tax administration after verification and consultation with the businessman or his representative. This estimated profit is calculated according to the profit rate with consideration to the type and activities of the business which shall be determined by Prakas of

the Ministry of Economy and Finance.

3. This tax level on estimated profit shall be kept constant for a period of 3 months, 6 months or 1 year.
4. The taxpayer subject to the tax on profit under estimated regime system of taxation shall pay this tax every month at the time fixed by the tax administration.

#### **ARTICLE 31: OBLIGATIONS OF WITHHOLDING AGENTS**

The person or designated payor who withholds tax under articles 25, and 26 of this law, or withhold tax on dividends under article 23 of this law shall submit a tax declaration and pay the tax withheld to the tax administration in the form as specified by the tax administration by the 15th day of the month following the month in which the withholding is made.

#### **ARTICLE 32: OBLIGATIONS OF PERSONS REQUIRED TO MAKE PREPAYMENTS OF THE TAX ON PROFIT**

Persons required to make prepayments for the tax on profit shall submit a tax declaration and pay the prepayment of the tax on profit to the tax administration in the form as specified by the tax administration by the 15th day of the month following the month in which the liability arose.

### **SECTION 8: SOURCES OF INCOME**

#### **ARTICLE 33: INCOME FROM CAMBODIAN SOURCES**

Except for contrary provisions in this law, the income as below shall be treated as from sources within the Kingdom of Cambodia:

1. interest paid by a resident enterprise or resident pass-through, or a governmental institution of the Kingdom of Cambodia;
2. dividends distributed by a resident enterprise of the Kingdom of Cambodia;
3. income from services performed in the Kingdom of Cambodia;
4. income from the rental of movable or immovable property for use in the Kingdom of Cambodia;
5. royalties from the use, or right to use intangible property in the Kingdom of Cambodia;
6. gain from the sale of immovable property located in the Kingdom of Cambodia or from the transfer of any interest in immovable property situated in the Kingdom of Cambodia;
7. gain from the sale of movable property, other than inventory, where the seller is a resident of the Kingdom of Cambodia;
8. premiums from the insurance or reinsurance of risks in the Kingdom of Cambodia.

#### **ARTICLE 34: INCOME FROM FOREIGN SOURCES**

The definition of foreign source income is obtained by taking the income definition as stated in article 33 of this law and substituting the term "a country other than the Kingdom of Cambodia" for the term "the Kingdom of Cambodia"

#### **ARTICLE 35: DETERMINATION OF SOURCE**

Where there is insufficient information to determine the source of income, or where the rules set forth so far cannot clearly reflect the income is from any one source the tax administration is the one to decide on the source of that income.

### **SECTION 9: CALCULATION OF ANNUAL TAX DUE**

#### **ARTICLE 36: FOREIGN TAX CREDIT**

A resident taxpayer who has received income from foreign sources and who has paid taxes according to foreign tax law shall receive a tax credit for deduction from the tax on profit to be paid in the Kingdom of Cambodia under the condition that there is presentation of documents confirming this tax payment abroad.

In order to calculate the tax to be paid in the Kingdom of Cambodia before deduction of this tax credit, the total amount of income received from Cambodian sources and foreign sources shall be taken into account.

The tax credit is determined separately for the tax paid by a Cambodian resident in each foreign country. But, the tax credit to be allowed for deduction in the tax year is the smaller of:

- a. the tax amount actually paid in a foreign country,
- b. the amount obtained by multiplying the total tax on profit from all sources for the same period calculated according to the tax rate in article 20 of this law with the ratio of income received in that foreign country to the total income from all sources.

The foreign tax credit is possible only if the resident taxpayer has complied with the formalities and supplied various documents as specified by the tax administration especially certification from the foreign tax payor and from the foreign tax administration.

In the case where the tax credit exceeds the tax liability, the amount of the excess may be carried forward to be used in succeeding years up to the fifth counting from the year following year in which the credit arose. In the case of tax credits in more than one year the credits must be taken in the order in which they arose.

#### **ARTICLE 37: DETERMINATION OF THE LIABILITY TO THE TAX ON PROFIT**

The calculation of the liability to the tax on profit shall be as follows:

1. calculate the total tax liability according to article 20 of this law,
2. minus any article 36 foreign tax credit but not in excess of the tax liability in paragraph 1 of this article,
3. minus any tax paid by the taxpayer on dividend distributions under article 23 of this law but not in excess of any tax liability after the reduction for the foreign tax credit as in paragraph 2 of this article.

#### **ARTICLE 38: DETERMINATION OF TAX DUE OR TAX CREDIT FOR THE TAX YEAR**

The determination of tax due or tax credit for the tax year shall be as follows:

1. If the result from the calculation in article 37 of this law is greater than the sum of any withholding tax made on the behalf of the taxpayer under article 25 of this law, and the prepayments for the tax on profit made by the taxpayer for the tax year under article 28 of this law, the taxpayer shall pay the difference to the tax administration.
2. If the result from the calculation in article 37 of this law is less than the sum of any withholding tax made on the behalf of the taxpayer under article 25 of this law, and the prepayments for the tax on profit made by the taxpayer for the tax year under article 28 of this law, the taxpayer may, after properly accounting for any minimum tax liability, apply for a refund of the difference, or carry the difference forward to be used as a prepayment in the following year.
3. Before making any tax payment under paragraph 1, or claiming any refund under paragraph 2, the taxpayer must first determine any liability for the minimum tax according to the procedures as stated in article 39 of this law.

#### **ARTICLE 39: DETERMINATION OF THE MINIMUM TAX, AND THE TAX DUE OR THE TAX CREDIT FOR THE TAX YEAR**

The determination of the minimum tax, the tax due or the tax credit for the tax year shall be as follows:

1. The taxpayer must pay the minimum tax at the time of the liquidation of the tax



on profit. The minimum tax due may be reduced by any liability for the tax on profit under article 20 of this law for the same tax year.

2. If the liability for the tax on profit exceeds the liability for the minimum tax:
  - a. the taxpayer shall pay any tax due under article 37 of this law at the time of submission of the tax declaration;
  - b. if the withholding in articles 25 and 28 of this law exceeds the minimum tax liability the taxpayer may claim a tax credit;
  - c. in the case as stated in paragraph 2 of this article, the taxpayer is not liable for minimum tax.
3. If the liability for the tax on profit is less than the liability for the minimum tax:
  - a. the taxpayer's tax credit under paragraph 2 of article 38 of this law will be reduced by the difference;
  - b. the amount by which the tax credit is reduced in complying with the sub-paragraph a of this paragraph, shall be considered as payment of the minimum tax for the tax year.

## **CHAPTER 2: PROVISIONS FOR THE TAX ON SALARY**

### **SECTION 1: GENERAL PROVISIONS**

#### **ARTICLE 40: CHARGE TO TAX**

The provisions for the tax on salary as stated in the Finance Act of 1995 promulgated by the Royal Kram No. 11NS94 dated 31 December 1994 shall be amended as follows for the benefit of the State Budget.

#### **ARTICLE 41: OBJECT OF TAX**

The tax on salary is a monthly tax imposed on salary that has been received within the framework of fulfilling employment activities

A physical person resident in the Kingdom of Cambodia is liable to the tax on salary for Cambodian source salary and foreign source salary.

A non-resident physical person is liable to the tax on salary for Cambodian source salary.

#### **ARTICLE 42: DEFINITIONS**

For the purposes of the provisions for the tax on salary:

1. The term "resident" when used for an employee, taxpayer, or physical person means domiciled in, or having a principal place of abode in, the Kingdom of Cambodia, or present in the Kingdom of Cambodia on more than 182 days in the calendar year.
2. The term "non-resident" means not resident.
3. Except for contrary provisions, any reference to the terms employee, taxpayer, and physical person are references to both residents and non-residents as defined in this article.
4. The term "employer" includes any government institution, any resident legal person, any resident pass-through, any permanent establishment in the Kingdom of Cambodia, any non-profit organization, or any resident physical person carrying on a business.
5. The term "employee" means any physical person receiving salary from their employment activity including any governmental officer, any elected official and the officer or director of an enterprise.
6. The term "Cambodian source salary" means salary received within the framework of fulfilling employment activities in the Kingdom of Cambodia. As for the salary received by a non-resident for furnishing technical assistance it shall be treated as from sources in the country where the payor of such income

resides.

7. The term “foreign” means:
  - a. when used with respect to an physical person means non- resident;
  - b. for the determination of the source of income, means outside of the Kingdom of Cambodia.
8. The term “salary” means remunerations, wages, bonuses, and overtime, compensations and fringe benefits which are paid to an employee, or which are paid for the direct or indirect advantage of the employee for the fulfillment of employment activities.

## **SECTION 2: TAX EXEMPT SALARY**

### **ARTICLE 43: SALARY OF DIPLOMATIC AND OTHER FOREIGN OFFICIALS**

The tax exemption for the salary of diplomatic and foreign officials shall be as follows:

1. Shall be exempted from the Tax on Salary:
  - a. Salaries that officers and employees of a diplomatic or consular mission of a foreign government holding a diplomatic or official passport of that government have received within the framework of fulfilling their official function in the Kingdom of Cambodia.
  - b. Salaries that foreign representatives, officials and employees of international organizations and of agencies of technical cooperation of other governments have received within the framework of fulfilling their official function in the Kingdom of Cambodia.
2. Any tax exemption in this article shall be based on the principle of reciprocity between the governments concerned.

### **ARTICLE 44: TAX EXEMPT INCOME OF EMPLOYEES**

Shall be tax exempted:

1. Real refunds on professional expenses made by the employee under the assignment and for the benefit of the employer and which satisfy the 3 following conditions:
  - a. made for the direct and exclusive interest of the enterprise;
  - b. not exaggerated nor extravagant;
  - c. supported by detailed invoices already paid and made in the name of the recipient of the real expense refund.
2. Indemnity for the layoff within the limit as provided in Labor Law.
3. Additional remuneration with social characteristics where there is provision in Labor Law.
4. Supply gratis or below acquisition cost of special uniforms or professional equipment.
5. Flat allowance for mission and travel expenses. This allowance should not overlap the real expense refund provided in this article.

## **SECTION 3: MONTHLY TAX BASE, MONTHLY TAXABLE SALARY AND THE DETERMINATION OF THE MONTHLY TAX**

### **ARTICLE 45: MONTHLY TAX BASE**

Except for fringe benefits taxable under article 48 of this law the monthly tax base for a resident is the taxable salary from which is deducted:

1. withholding obligations as the result of the compliance with the Labor Law in order to create pensions and for the maintenance of social welfare;

2. payments which are allowed to be tax exempt in Article 44 of this law.

**ARTICLE 46: MONTHLY TAXABLE SALARY**

The monthly taxable salary shall be determined as follows:

1. Monthly taxable salary for a resident employee includes:
  - a. salary received from Cambodian sources;
  - b. salary received from foreign sources;
  - c. advance money, loan or installment made by the employer to the employee which shall be added to the taxable salary of the month in which they are paid out and shall be deducted from salary in the month of any repayment made by the employee.
2. Based on the evidence of family situation, any resident employee with:
  - a. minor dependent children at the time of tax payment is allowed a reduction in the tax base of seventy-five thousand Riels per each child per month,
  - b. spouse having only an occupation as housewife is allowed a reduction in the tax base of seventy-five thousand Riels for one person only per month.
3. For a non-resident taxpayer taxable salary includes salary from Cambodian sources taxable according to the provisions of this chapter.

**ARTICLE 47: DETERMINATION OF THE MONTHLY TAX OF AN EMPLOYEE**

For a resident employee the tax to be paid must be determined on the monthly taxable salary and must be withheld by the employer according to the progressive rates by tranche as follows:

<u>Taxable Parts of the Monthly Salary</u>	<u>Tax Rate</u>
From 0 to 500,000 Riels	0%
From 500,001 to 1,250,000 Riels	5%
From 1,250,001 to 8,500,000 Riels	10%
From 8,500,001 to 12,500,000 Riels	15%
Over 12,500,000	20%

**ARTICLE 48: THE DETERMINATION OF THE TAX ON FRINGE BENEFITS**

For fringe benefits, every month, the employer shall withhold and pay tax by the time specified at the rate of 20 percent of the total value of fringe benefits given to all employees. The value of fringe benefits is the fair market value inclusive of all taxes.

**ARTICLE 49: DETERMINATION OF THE TAX ON SALARY FOR A NON-RESIDENT TAXPAYER**

Except for fringe benefits to be taxed under article 48 of this law, for a non-resident taxpayer the tax shall be withheld by the payor at the rate of 15 percent on every payment of taxable salary as provided in paragraph 3 of article 46 of this law. This withholding tax is the final tax on salary for the non-resident receiving the salary.

**ARTICLE 50: FOREIGN TAX CREDIT**

A resident taxpayer who has received foreign source salary and who has paid taxes according to foreign tax law shall receive a tax credit which for deduction from the tax on salary to be paid in the Kingdom of Cambodia under the conditions that there is presentation of documents confirming this payment abroad.

- a. In order to calculate the tax to be paid in the Kingdom of Cambodia before

deduction of this tax credit, the total amount of salaries received from Cambodian sources and foreign sources shall be taken into account.

- b. The tax credit is determined separately for the tax paid by a Cambodian resident in each foreign country. But, the tax credit to be allowed for the tax on salary paid abroad is the smaller of:
- the tax amount actually paid in a foreign country, or
  - the amount obtained by multiplying the tax on total salaries from all sources for the same period calculated according to the table of progressive tax rates by tranche in article 47 of this law with the ratio of salary received in that foreign country to the total salaries from all sources.

The refund of the foreign tax credit is possible only if the resident taxpayer has complied with the formalities and supplied various documents as specified by the tax administration especially the certification from the employer and from the tax administration of the place of employment abroad.

#### **SECTION 4: OBLIGATIONS OF EMPLOYERS AND EMPLOYEES**

##### **ARTICLE 51: CAUSE OF TAX LIABILITY**

The salary payment is the cause of the tax liability.

##### **ARTICLE 52: TAX DEBT AND THE OBLIGATION TO WITHHOLD**

The tax debt and the obligation to withhold shall be as follows:

1. This tax is the debt of the physical person receiving the salary, including foreign physical persons, except for contrary provisions as stated in international agreement.
2. The tax on salary shall be collected through monthly withholding procedure by the employer at the time of each salary payment.
3. If the employer resides abroad, the fiscal representative appointed in the Kingdom of Cambodia by the employer is the one in charge of withholding the tax on salary prior to the salary payment to employees and of transferring their taxes to the State.
4. The employer or the resident representative in the Kingdom of Cambodia of a foreign employer and the employee shall be jointly responsible for the payment of the tax on salary in the Kingdom of Cambodia regardless of whether the salary is paid in the Kingdom of Cambodia or abroad. In the case where no withholding is made on the tax on salary, the employer is held responsible under this law even if the tax is already paid by the employee.

##### **ARTICLE 53: PAYMENT OF TAX WITHHELD**

The withholding tax related to the salary payment made in any one month shall be paid by the 15th of the following month to the tax administration in the area of the domicile or principal establishment of the person in charge of withholding the tax.

##### **ARTICLE 54: TAX WITHHOLDING, RECORD KEEPING AND REPORTING REQUIREMENTS**

All employers who make taxable salary payments shall be in charge of:

1. withholding tax prior to the salary payment;
2. reporting to the tax administration and the employee of the status of the tax withheld;
3. keeping and maintaining books and records which shall be determined by prakas of the Ministry of Economy and Finance.

#### **CHAPTER 3: PROVISIONS FOR THE TAX ON VALUE ADDED**

##### **SECTION 1: GENERAL PROVISIONS**

##### **ARTICLE 55: CHARGE TO TAX**

From 1 January 1998 onward, shall be established a Tax on Value Added on taxable supplies for the benefit of the State budget.

**ARTICLE 56: DEFINITIONS**

For the purpose of the provisions of the tax on value added:

1. The term “good” means tangible property other than land or money.
2. The term “service” means the provisions of something of value other than goods, land, or money.
3. The term “supply of a good” means the transfer of the right to use or dispose of a good as the owner whether or not for consideration. The supply of a service incidental to the supply of a good shall be considered a supply of a good.
4. The term “supply of a service” means a supply that is not a supply of a good or land or money which is made for consideration. The supply of a good incidental to the supply of a service shall be considered a supply of a service.
5. The term “person” means any person or group of persons engaged in business and any other person who is related to the person.
6. The term “related” in relation to a person means:
  - a. a person who owns 20 percent of more in value or voting power in equity interests in the person under consideration;
  - b. having common management or directors with the person;
  - c. a member of the family or spouse or a member of the family of the spouse of the person;
  - d. purchasing 30 percent or more of the person's total output in any three consecutive month period.
7. The term “tax” in this chapter means the tax on value added.

**ARTICLE 57: NON TAXABLE SUPPLIES**

Non taxable supplies are as follows:

1. Public postal service.
2. Hospital, clinic, medical, and dental services and the sale of medical and dental goods incidental to the performance of such services.
3. The service of transportation of passengers by a wholly state owned public transportation system.
4. Insurance services.
5. Primary financial services which shall be determined by prakas of the Ministry of Economy and Finance.
6. The importation of articles for personal use that are exempt from customs duties and that are within the value level which shall be determined by prakas of the Ministry of Economy and Finance.
7. Non profit activities in the public interest that have been recognized by the Minister of Economy and Finance.

**ARTICLE 58: NON TAXABLE SUPPLIES FOR DIPLOMATIC MISSIONS AND INTERNATIONAL ORGANIZATIONS**

Non taxable supplies for diplomatic missions and international organizations shall be as follows:

1. The imports of goods for or by foreign diplomatic and consular missions, international organizations and agencies of technical cooperation of other

governments for use in the exercise of their official function shall be treated as non taxable supplies. Non taxable supplies shall only be allowed on the certification by the chief of mission to the Tax Department that the goods are being imported for purpose of the use as above.

2. The import of goods for the personal use of the official personnel of missions and organizations as stated in paragraph 1 of this article shall be treated as non taxable supplies only for those items that are on an enumerated list which shall be determined by prakas of the Ministry of Economy and Finance.
3. The non taxable supplies in this article shall be based on the principle of reciprocity between governments concerned.

## **SECTION 2: GENERAL PRINCIPLES FOR THE TAX ON VALUE ADDED**

### **ARTICLE 59: TAXABLE PERSON**

The taxable person refers to any person subject to the real regime system of taxation who makes a taxable supply as stated in article 60 of this law.

A person subject to the simplified regime system of taxation may apply to be classified as a taxable person. The conditions and procedures for this application shall be determined by prakas of the Ministry of Economy and Finance.

For the purpose of this chapter, an employee shall not be treated as a taxable person with respect to activities engaged in as an employee.

### **ARTICLE 60: TAXABLE SUPPLY**

Except for contrary provisions in this chapter, the term “taxable supply” means:

1. the supply of goods or services by a taxable person in the Kingdom of Cambodia;
2. the appropriation of goods for his own use by the taxable person;
3. the making of a gift or supply at below cost of goods or services by the taxable person;
4. the import of goods into the customs territory of the Kingdom of Cambodia.

The rules and procedures for the application of this article shall be provided in sub-decree.

### **ARTICLE 61: TAXABLE VALUE**

The taxable value shall be determined as follows:

1. The taxable value for any supply shall be the price of the goods or services the seller charged the purchaser. The taxable value includes any charges for transportation and other items payable to the seller with respect to the supply, including any specific tax on certain merchandise and services but excluding the tax on value added. Procedures for the adjustment of the taxable value at the time of supply and after the time of supply shall be determined by sub-decree.
2. When the payment for a taxable supply involves any consideration other than money for the direct or indirect benefit of the seller, this consideration shall be included in the taxable value at its fair market value.
3. The taxable value for any imported good shall be the customs value including insurance and freight plus any customs duties and any specific tax on certain merchandise and services. If there is no such adjusted customs value, the fair market value shall be used.
4. If the taxable value of the goods or services supplied does not represent the true value, the tax administration may determine a value for such goods or services and such value shall be presumed to be the correct value until proven otherwise to the satisfaction of the tax administration.
5. The taxable value of used goods that the taxable person regularly purchases from consumers for resale or sells on behalf of other persons shall be the differential between the selling price and the purchase price, or the commission

from the sale of those goods.

**ARTICLE 62: TIME OF SUPPLY**

The time of supply shall be determined as follows:

1. The tax on value added becomes due and payable at the time of supply.
2. The time of supply of goods and services shall be the time by which the seller must issue the invoice or the time the seller issues the invoice if that invoice is issued before the time it must be issued by the seller.
3. A value added tax invoice must be issued within seven days after the goods are shipped or services rendered or after payment if payment occurs before the goods are shipped or services rendered. If a shipment is not accompanied by an invoice, there shall be attached a shipping document which has been properly recorded in the shipping journal.
4. For the supply of goods or services which are made continuously or which involve multiple payments, the time of supply shall be determined by prakas of the Ministry of Economy and Finance.
5. In the case of the import of goods, the time of supply shall be the time the importer files a declaration to the customs administration according to the regulations in force.

**ARTICLE 63: LOCATION OF SUPPLY**

The location of supply shall be determined as follows:

1. The supply of a good takes place in the Kingdom of Cambodia if the good is delivered in the Kingdom of Cambodia, whether that delivery takes on the characteristic of a transfer of the right to use or to dispose. In the case where the supply must include transportation, the supply takes place in the Kingdom of Cambodia if the good is in the Kingdom of Cambodia when the transportation starts.
2. The supply of a service takes place in the Kingdom of Cambodia if the service is performed in the Kingdom of Cambodia, except that:
  - a. the supply of a service in connection with immovable property is deemed to take place where the property is located;
  - b. the supply of a service in connection with transport is deemed to take place where the transport occurs.
3. Goods are imported into the Kingdom of Cambodia if they are brought within the customs territory of the Kingdom of Cambodia.

**SECTION 3: TAX RATE AND THE CALCULATION OF TAX**

**ARTICLE 64: TAX RATE**

The tax rate shall be as follows:

1. The tax on value added shall be imposed at the tax rate of 10 percent on the taxable value of each taxable supply in the Kingdom of Cambodia.
2. The tax on value added shall be imposed at the tax rate of 0 percent on the taxable value of each taxable supply of goods exported from the Kingdom of Cambodia and of the taxable supply of a service rendered outside of the Kingdom of Cambodia as stated in article 63 of this law.
3. The tax administration may use a number of documents to certify that export has in fact occurred including export certification from the Customs Department, import documents from the country of import, executed letters of credit, and payments received by a domestic bank.

**ARTICLE 65: INPUT TAX CREDIT AND NON TAXABLE SUPPLIES**

The input tax credit and the non taxable supplies shall be determined as follows:

1. The tax paid by a taxable person on goods and services for use in the business which are supplied by another taxable person or the tax paid by the taxable person as an importer on imported goods or services for use in his own business shall become an input tax credit deductible against the output tax. Input means any goods or services purchased and output means any goods or services sold.
2. In the case where goods and services purchased are used partly for taxable supplies and partly for non taxable supplies, the tax credit shall be allowed only for that portion used for taxable supplies.

**ARTICLE 66: DETERMINATION OF TAX**

The tax amount shall be determined as follows:

1. The tax charged under article 64 of this law shall become a debt to the State at the time of supply.
2. The tax to be paid to the State is equal to the total output tax according to the rates in article 64 of this law minus the total input tax credit allowed for the same month.

**ARTICLE 67: CAPITAL ASSETS THAT CEASE TO BE USED IN THE BUSINESS**

If a capital asset for which a tax credit has been received under article 65 of this law ceases to be used in the business of the taxable person, such asset shall be treated as sold and taxable for its then fair market value at the time of cessation of use.

**ARTICLE 68: NECESSARY DOCUMENTATION TO CLAIM AN INPUT TAX CREDIT**

The request for an input tax credit shall be attached with:

1. a value added tax invoice, drawn up in accordance with article 78 of this law,
2. a customs Bill of Entry for Import, certified by customs authorities, which must state the name of the taxable person as consignee or importer and the amount of tax paid at the time of import.

**ARTICLE 69: INPUT TAX NOT ALLOWED AS A TAX CREDIT**

The input tax that shall not be allowed as a tax credit includes the tax paid by a taxable person on entertainment, amusement, or recreation expenses; the purchase of automobiles; or the purchase of certain petroleum products.

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# MINISTRY OF ENVIRONMENT

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*Environment Law*

**Kingdom of Cambodia**

Nation - Religion - King

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## LAW ON ENVIRONMENTAL PROTECTION AND ATURAL RESOURCE MANAGEMENT

### Chapter I General provision Article 1-

The purposes of law are:

- To protect {and} promote environmental quality and public health through the prevention, reduction, and control of pollution.
- To assess the environmental impacts of all proposed projects prior to the issuance of the decision by the Royal Government.
- To ensure the rational and sustainable conservation, development, management, and use of the natural resources of the Kingdom of Cambodia .
- To encourage and enable the public to participate in environmental protection and natural resource management.
- To suppress any acts that cause harm to the environment.

### Chapter II National and Regional Environmental Plans Article 2-

The Ministry of Environment, in collaboration with other concerned ministries and institutions, shall:

- Prepare a National Environmental Plan.
- designate regions and prepare a Regional Environmental Plan for each Region.

The National and Regional Environmental Plans shall be decided by the Royal Government.

### Article 3-

The National Environmental Plan is a plan of environmental protection and sustainable natural resource management throughout the Kingdom of Cambodia.

The National Environmental Plan shall :

- identify important environmental issues and important natural resource management issues that are related to socio-economic development.

- set forth measures to ensure environmental management.

#### **Article 4-**

The Regional Environmental Plan shall be consistent with the National Environmental Plan.

The regional Environmental Plan shall:

- identify important environmental issues and important natural resource management issues that are related to Socio-economic development of the respective regions.
- set forth measures to ensure environmental management in the said region.

#### **Article 5-**

The National and Regional Environmental Plan shall be reviewed and revised at least once every five years.

### **Chapter III**

#### **Environmental Impact Assessment**

##### **Article 6-**

An environmental impact assessment shall be conducted on every project and activity of the private or public , and shall be approved by the Ministry of Environment before being submitted to the Royal Government for decision.

This assessment shall also be conducted for existing activities that have not yet been assessed for environmental impacts.

The procedures of the process for environmental impact assessment shall be defined by sub-decree following a proposal of the Ministry of Environment.

The nature and size of the proposed projects and/ or activities (proposed and existing ) both private and public, that shall be subject an environmental impact assessment which shall be defined by sub-decree following a proposal of the Ministry of Environment.

##### **Article 7-**

All investment Project Applications and all proposed State projects shall be subject to an initial Environmental Impact Assessment and / or Environmental Impact Assessment as specified in article 6 of this law. The Ministry of environment shall review and provide recommendations on the initial Environmental Impact Assessment and / or environmental impact assessment to the competent bodies within period determined by the Law on Investment of the Kingdom of Cambodia.

### **Chapter IV**

#### **Natural Resource Management**

##### **Article 8-**

he natural resources of the Kingdom of Cambodia, which include land , water airspace, air, geology, ecological systems , mines , energy, petroleum and gas, minerals, forests and forest products , wildlife , fish , [and] aquatic resources, shall be managed in an environmentally rational and sustainable manner.

The natural protected areas including Natural Parks , wildlife sanctuaries , Protected Landscapes Areas and Multiple use Management Areas shall be determined by Royal Decree.

#### **Article 9-**

The Ministry of Environment, in collaboration with concerned ministries, shall conduct research, assess the environmental impacts on natural resources, and provide the concerned ministries with recommendations to ensure that the natural resources as specified in article 8 are managed in an environmentally rational and sustainable manner.

#### **Article 10-**

Before making decisions or undertaking activities related to the conservation, development or management of natural resources , the concerned ministries shall consult with the Ministry of Environment about the Sustainability of natural resources.

#### **Article 11-**

The Ministry of Environment shall immediately inform concerned ministries whenever the Ministry of Environment finds that natural resources are not being managed and used in an environmentally rational and sustainable manner.

### **Chapter V**

#### **Environmental Protection**

#### **Article 12-**

The Ministry of Environment shall collaborate with concerned ministries to develop an inventory indicating the following:

- The sources types, and quantities of all pollutants and waters being imported, generated, transported, recycled , treated stored, disposed, or released into the airspace, water, or on land.
- The sources types, and quantities of all toxic and hazardous substances some being imported , manufactured , transported , used generated , being treated , recycled , disposed , or being released into the airspace, water or into land or on land.
- the sources, types, and extent of noise and vibration disturbances.

#### **Article 13-**

The prevention , and control of airspace , water and land pollution, noise and vibration disturbances and provisions on waste, toxic substances, and hazardous substances, shall be determined by sub-decree following a proposal of the Ministry of Environment.

### **Chapter VI**

#### **Monitoring, Record-keeping, and Inspection**

#### **Article 14-**

He Ministry of Environment shall collaborate with concerned ministries to require the owner or responsible person of factories, pollution sources, industrial sites, or sites of natural resources development activity:

- to install or use monitoring equipment

- to provide samples
- to prepare or maintain and submit review records and reports

#### **Article 15-**

In order to carry out its mission and its responsibilities on Natural Protected Areas, the Ministry of Environment, in collaborate with concerned ministries, may enter [and] conduct an inspection at a site, premises building, or any transport facility or any place, deemed necessary when the Ministry of Environment finds that these sources adversely affect the environment.

The Ministry of Environment Inspector and the official of the concerned ministries that is collaborating shall present their identification, and latter of authorization before conducting the inspection.

During the inspection, when the inspector find any criminal offense, they shall immediately submit a report to the competent entity for taking legal action.

The inspection procedures shall be determined by sub-decree following a proposal of the Ministry of Environment.

### **Chapter VII**

#### **Public Participation and access to information**

#### **Article 16-**

The Ministry of Environment shall provide, following a request from the public, information on its activities, and shall encourage public participation in environmental protection and natural resource management.

#### **Article 17-**

The procedure for public participation and access to information shall be determined by sub-decree following a proposal of the Ministry of Environment.

#### **Article 18-**

Information related to environmental protection or natural resource management shall be mutually disseminated between the Ministry of Environment and different ministries.

### **Chapter XIII**

#### **Environment Endowment Fund**

#### **Article 19-**

he special account of the treasury shall be created which is an Environment Endowment Fund for the Ministry of Environment to finance environmental protection and the conservation of natural resources in the Kingdom of Cambodia in accordance with the finance law.

The Environment Endowment Fund coming from contributions from the Royal Government, grants from international organizations, donations from kind people and from non-Governmental organizations and other legal incomes shall be included in the national Budget for providing the above special account.

### **Chapter IX**

## Penalties

### Article 20-

For any person that commit a violation of the prescription of the Ministry of Environment as specified in article 14 of this law, the Ministry of Environment shall issue a written order requiring:

- Correction of the violating activities immediately or within a specified time period or
- Termination of its activities until that violation has been corrected or,
- Clean-up the pollution immediately.

### Article 21-

Any person that refuses or obstructs the inspection officials for entering to conduct an inspection as specified in the paragraph 1 article 15 of this law shall be subject of fine ranging from five hundred thousand Riel ( 500,000 00 Riel ) to one million Riel ( 1 000000.00 Riel ).

In case of repeated offense, the violator shall be subject of fine ranging from one million Riel ( 1,000,000 00 Riel ) to five million Riel ( 5,000,000 00 Riel ) or imprisonment from one month to one year or both these punishments.

### Article 22-

If the violation causes danger to human health, life, private/public property, the environment , [or] to natural resources , it shall be subject to fine ranging from ten million Riel ( 10,000,000 00 Riel ) to fifty million Riel ( 50,000,000 00 Riel ) or imprisonment from one year to five years or both these punishments.

Persons that commit a violation shall be responsible for repairing damage and for compensating all administration cost associated with the violation.

### Article 23-

In case when the violation causes serious disaster to society, the court will use circumstantial evidence connected with other offenses above in order to pronounce the sentence.

### Article 24-

Any environmental inspection officials who neglects by paying no attention, or does not comply with regulations of the Ministry of Environment , or conspire with the offender, or facilitate the commission of the offense , shall be subject to administrative sanctions or face prosecution before the court.

### Article 25-

The Ministry of Environment shall apply the provisions of above article 20 for any person that commit a violation of sub-decrees or other regulation related to the provisions of this law.

## Chapter X

### Interim Provision

### Article 26-

Subsequent entering into force of this law until December, 31,2001, for

existing activities , the Royal Government may extend the period to comply with a sub-decree specified in article 13 of this law following a proposal of the Ministry of Environment.

In making a decision for this extension, it shall :

- Take into account the nature and extent of the harm to human health , the environment and the natural resources that may result from this extension.
- Review the possibility, means, technicality , and finance mechanism for the existing activity.

## **Chapter XI**

### **Final Provision**

#### **Article 27-**

Any provision that are contrary to this law shall be considered null and void.

- 1- [Sub-decree on Solid Waste Mangement](#)
- 2- [Sub-decree on Water Pollution Control](#)
- 3- [Declaration 01](#)
- 4- [Sub-decree on Environmental Impact Assessment](#)

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# ***Kingdom of Cambodia***

**Nation****Religion****King****ROYAL GOVERNMENT***Council of Ministers***No: 72 ANRK.BK****Phnom Penh, August 11, 1999**

Sub-Decree

on

Environmental Impact Assessment Process

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**The Royal Government of Cambodia (RGC)**

- has seen the Constitution of the Kingdom of Cambodia (1993);
- has seen the Royal Decree No. NS.RKT 1198.72 dated 30 November, 1993 on the Formation of the Royal Government of Cambodia of the Kingdom of Cambodia;
- has seen Preah Reach Kram No NS.RKM 02 NS.94 dated 20 July 1994, to allow using the Law on the Establishment and Implementation of the Council of Ministers;
- has seen Preah Reach Kram No NS.RKM 0196.2 dated 24 January 1996, announcing to use the Law on the Establishment of the Ministry of Environment;
- has seen Preah Reach Kram No NS.RKM 1296.36 dated 24 December 1996, announcing to use the Law on the Environmental Protection and Natural Resources Management;
- has received an approval from the meeting of the Council of Ministers on 23 July 1999.

**and has made a decision as the following:****CHAPTER I****GENERAL PROVISIONS****ARTICLE 1:**

The main objectives of this sub-decree are:

- To determine an Environmental Impact Assessment (EIA) upon every private and public project or activity, and it must be reviewed by the Ministry of Environment (MoE), prior to the submission for a decision from the Royal Government.
- To determine the type and size of the proposed project(s) and activities, including existing and ongoing activities in both private and public prior to undertaking the process of EIA.
- Encourage public participation in the implementation of EIA process and take into account of their conceptual input and suggestion for re-consideration prior to the implementation of any project.

**ARTICLE 2:**

This sub-decree hereby applies to every proposed and ongoing project(s) and activities, either by private, joint-venture or state government, ministry institutions of which are described in the annex of this sub-decree, except a special case, where a project will be approved by the Royal Government.

## CHAPTER II

### INSTITUTIONAL RESPONSIBILITIES

#### ARTICLE 3:

The MoE has responsibilities as following:

- a/ scrutinize and review the report of the Environmental Impact Assessment in collaboration with other concerned ministries;
- b/ follow up, monitor and take appropriate measures to ensure a Project Owner will follow the Environmental Management Plan (EMP) while project construction is taking place and accede to their EIA report's approval.

#### ARTICLE 4:

Institutions and ministries who are responsible for proposed project, shall have the right to examine and approve any project(s) that stated in the annex of this sub-decree, after the MoE has reviewed and commented on their EIA report.

#### ARTICLE 5:

Provincial/Urban authority that is responsible for proposed project, has the following duties:

- a/ acquire a EIA report from a project owner either private, joint-venture or public sector to submit to the Provincial Environmental Office.
- b/ review and approve the proposed project, after discussing and commenting among provincial/urban authority concerned in accordance with the Prakas "Declaration" of the MoE.

## CHAPTER III

### EIA IS NEEDED FOR PROPOSED PROJECT(S)

#### ARTICLE 6:

A Project Owner must conduct Initial Environmental Impact Assessment (IEIA) in order to comply with the EIA requirement as stated in the annex of this sub-decree.

#### ARTICLE 7:

A Project Owner must apply to the MoE for reviewing their IEIA report and report of pre-feasibility study .

#### ARTICLE 8:

A Project Owner must apply to the MoE for reviewing their full report of EIA report and pre-feasibility study, in case a project tends to cause a serious impact to the natural resources, ecosystem, health and public welfare.



**ARTICLE 9:**

A Project Owner must apply to the Provincial/Urban Environmental Office (PEO) for reviewing their EIA report and pre-feasibility study report as described in Article 7 and Article 8, if their project takes at provincial level.

**ARTICLE 10:**

A guideline for preparing a report of IEIA and EIA will be determined by the Prakas of the MoE.

**ARTICLE 11:**

A Project Owner must cover all the fee's services for reviewing and monitoring upon their project. These service fees shall be approved by the Ministry of Economy and Finance following the proposal of the MoE. The said fee shall be incorporated into the national budget.

**ARTICLE 12:**

A Project Owner must contribute a donation to the Environmental Endowment Fund as described in Article 19 of Chapter 8 of the law on Environmental Protection and Natural Resources Management.

**ARTICLE 13:**

Environmental Application Form (EAF) must be completed by a Project Owner and must be submitted to the MoE if project(s) existed at ministry's level. If project(s) existed at provincial/urban level, then the EAF must be submitted to PEO.

**CHAPTER 4****PROCEDURES OF EIA PROCESS FOR REVIEWING****PROPOSED PROJECT(S)****ARTICLE 14:**

A Project Owner must prepare a report, as described in Article 7, and must submit it to the MoE and forward a copy to the Project Approval Ministry/Institution.

**ARTICLE 15:**

The MoE will review EIA report, as described in Article 14 and will provide findings and recommendations back to the Project Owner and to the Project Approval Ministry/Institution within 30 work-days, commencing from the date of registration of their IEIA report and pre-feasibility study report.

**ARTICLE 16:**

When a project is requested to submit a full report of EIA, as described in Article 8, the Project Owner/Responsible Person shall submit it to the MoE along with their application for project's investment with the Project Approval Ministry/Institution.

**ARTICLE 17:**

The MoE will review the report, as described in Article 16 and will provide findings and

recommendations back to the Project Owner and to Project Approval Ministry/Institution within 30 work-days, commencing from the date of the receipt of their EIA report and pre-feasibility study report.

#### ARTICLE 18:

If the MoE fails to respond its findings and recommendations as described in Article 15 and 17, the Project Approval Ministry/Institution will assume that the revised IEIA or EIA report has complied with the criteria of this sub-decree.

#### ARTICLE 19:

In capacity as the Project Approval Ministry/Institution and Project Owner, the Project Owner must carry out all the procedures as described in Charter 3 and 4 of this sub-decree.

#### ARTICLE 20:

The Project Owner must acknowledge the findings and recommendations of their IEIA or/and EIA report(s) in which have been approved by the MoE, before they can proceed their project's implementation.

### CHAPTER 5

#### PROCEDURES OF EIA PROCESS FOR REVIEWING

##### EXISTING PROJECT(S)

#### ARTICLE 21:

At least within a year of the promulgation of this sub-decree, all Existing Project Owner/Responsible Person must compile their IEIA report and must submit it to the MoE for a review and approval on their existing/ongoing activity of which previously allowed by the Project Approval Ministry/Institution.

#### ARTICLE 22:

Project Owner/Responsible Person must compile a full report of EIA within 6 months in accordance to the requirement in Charter 3 and 4 of this sub-decree and must submit it to the MoE, after the MoE reviewed their existing/ongoing activity is needed to submit a full report of EIA.

#### ARTICLE 23:

Project Owner/Responsible Person must carry out the EMP as stated in the EIA for period of 6 calendar months, commencing from the date of the MoE confirmation of their EIA report duly fulfilled the criteria of this sub-decree.

#### ARTICLE 24:

At least within two years of the promulgation of this sub-decree, Project Owner/Responsible Person must compile IEIA report and must submit it to PEO for a review and approval on their existing/ongoing activity of which previously allowed by the Provincial/urban Project Approval Office in that province.

#### ARTICLE 25:

Project Owner/Responsible Person must compile a full report of EIA within 6 months in accordance to the requirement in Charter 3 and 4 of this sub-decree and must submit it to the PEO, after the PEO reviewed their existing/ongoing activity is needed to submit a full report of EIA.

#### ARTICLE 26:

Project Owner/Responsible Person must carry out the EMP as stated in the EIA for period of 6 calendar months, commencing from the date of the PEO confirmation of their EIA report duly fulfilled the criteria of this sub-decree.

### CHAPTER 6

#### CONDITIONS FOR APPROVING PROJECT(S)

#### ARTICLE 27:

The Project Approval Ministry/Institution shall provide some guidelines to Project Owner/Responsible Person on the EMP, in which is described in the EIA' guidelines prepared and approved by the MoE.

#### ARTICLE 28:

The MoE must co-operate with other line ministries/institutions to halt all existing/ongoing activities of Project Owner/Responsible Person, which failed to accomplish the EMP, stated in the approval of their EIA report.

### CHAPTER 7

#### PENALTIES

#### ARTICLE 29:

A Project Owner/Responsible Person, who fails to submit their EIA report or provides false information or mis-conduct the EMP, as described in their EIA report, or violates any provisions in this sub-decree, will be offended by Cambodian law, as stated in Article 20/21/22/23 and 25 of Charter 5 of the Law on Environmental Protection and Natural Resources Management.

#### ARTICLE 30:

The MoE duly has a responsibility to compile a report and complaint against any Project Owner/Responsible Person who has been dis-respected or mis-conducted of any articles described in this sub-decree.

#### ARTICLE 31:

Any environment official, who has neglected, lacked vigilance or dis-respected the MoE's regulations, or conspires with perpetrator or assist this perpetrating activity, must be subject to administrative offense or faced prosecution in front of the court of law.

### CHAPTER 8

#### FINAL PROVISIONS

#### ARTICLE 32:

Any provisions that are contrary to this sub-decree, shall be considered null.

### ARTICLE 33:

The minister in charge of the Council of Ministers, ministries, concerned institutions shall collaborate with the MoE and must be responsible for this sub-decree in relation of their individual roles and responsibilities.

### ARTICLE 34:

This sub-decree shall be in effect from the date of the signature below.

Phnom Penh on 11 August 1999

Prime Minister

(Signed with Seal of RGC stamp)

HUN SEN

has reported to Samdech Prime Minister  
by the Minister of Environment  
Dr. Mok Mareth

- cc:
- Cabinet of King
  - General Secretariat of Senate
  - General Secretariat of Parliament
  - Ministry of Royal Palace
  - General Secretariat of Constitution
  - Cabinet of Prime Minister
  - General Secretariat of Council of Ministers
  - As stated in Article 33 for "action"
  - Record and documentation.

Annex of Sub-Decree No 72 ANRK. BK. Date 11, August 1999

#### List of the Projects Required an IEIA or EIA

No.	Type and activities of the projects	Size / Capacity
A	Industrial	
I	Foods, Drinks, Tobacco	
1.	Food processing and caned	<sup>3</sup> 500 Tones/year
2.	All fruit drinks manufacturing	<sup>3</sup> 1,500 Litres / day
3.	Fruit manufacturing	<sup>3</sup> 500 ones/year
4.	Orange Juice manufacturing	All sizes
5.	Wine manufacturing	All sizes
6.	Alcohol and Beer brewery	All sizes
7.	Water supply	<sup>3</sup> 10,000 Users
8.	Tobacco manufacturing	<sup>3</sup> 10,000 Boxes/day

9.	Tobacco leave processing	<sup>3</sup> 350 Tones/ year
10.	Sugar refinery	<sup>3</sup> 3,000 Tones / year
11.	Rice mill and cereal grains	<sup>3</sup> 3,000 Tones / year
12.	Fish, soy bean, chili, tomato sources	<sup>3</sup> 500,000 Litres/ year
II.	Leather tanning, Garment and Textile	
1.	Textile and dyeing factory	All sizes
2.	Garments, washing, printing, dyeing	All sizes
3.	Leather tanning, and glue	All sizes
4.	Sponge- rubber factory	All sizes
III.	Wooden production	
1.	Plywood	<sup>3</sup> 100,000m <sup>3</sup> /year(log)
2.	Artificial wood	<sup>3</sup> 1,000 m <sup>3</sup> /year (log)
3.	Saw mill	<sup>3</sup> 50,000m <sup>3</sup> /year (log)
IV.	Paper	
1.	Paper factory	All sizes
2.	Pulp and paper processing	All sizes
V.	Plastic, Rubber and Chemical	
1.	Plastic factory	All sizes
2.	Tire factory	<sup>3</sup> 500 Tones /year
3.	Rubber factory	<sup>3</sup> 1,000 Tones /year
4.	Battery industry	All sizes
5.	Chemical production industries	All sizes
6.	Chemical fertilizer plants	<sup>3</sup> 10,000 Tones /year
7.	Pesticide industry	All sizes
8.	Painting manufacturing	All sizes
9.	Fuel chemical	All sizes
10.	Liquid, powder, solid soaps manufacturing	All sizes
VI	Mining production other than metal	

1.	Cement industry	All sizes
2.	Oil refinery	All sizes
3.	Gas factory	All sizes
4.	Construction of oil and gas pipeline	³ 2 Kilometers
5.	Oil and gas separation and storage facilities	³ 1,000,000 Litres
6.	Fuel stations	³ 20,000 Litres
7.	Mining	All sizes
8.	Glass and bottle factory	All sizes
9.	Bricks, roofing tile manufacturing	150,000 piece /month
10.	Flooring tile manufacturing	90,000 piece /month
11.	Calcium carbide plants	All sizes
12.	Producing of construction materials(Cement)	900 tones/month
13.	Cow oil and motor oil manufacturing	All sizes
14.	Petroleum study research	All sizes
VII	Metal industries	
1.	Mechanical industries	All sizes
2.	Mechanical storage factory	All sizes
3.	Mechanical and shipyard enterprise	All sizes
VIII	Metal Processing Industrials	
1.	Manufacturing of harms, barbed wires, nets	³ 300 Tones/month
2.	Steel mill, Irons, Aluminum	All sizes
3.	All kind of smelting	All sizes
IX	Other Industries	
1.	Waste processing, burning	All sizes
2.	Waste water treatment plants	All sizes
3.	Power plants	³ 5 MW
4.	Hydropower	³ 1 MW
5.	Cotton manufacturing	³ 15 Tones/month
6.	Animal's food processing	³ 10,000 Tones/year
B.	AGRICULTURE	

1.	Concession forest	³ 10,000 Hectares
2.	Logging	³ 500 Hectares
3.	Land covered by forest	³ 500 Hectares
4.	Agriculture and agro-industrial land	³ 10,000 Hectares
5.	Flooded and coastal forests	All sizes
6.	Irrigation systems	³ 5,000 Hectares
7.	Drainage systems	³ 5,000 Hectares
8.	Fishing ports	All sizes
C.	TOURISM	
1.	Tourism areas	³ 50 Hectares
2.	Goal field	³ 18 Holes
D.	INFRASTRUCTURE	
1.	Urbanization development	All sizes
2.	Industrial zones	All sizes
3.	Construction of bridge-roads	³ 30 Tones weight
4.	Buildings	Height ³ 12 m or floor ³ 8,000 m <sup>2</sup>
5.	Restaurants	³ 500 Seats
6.	Hotels	³ 60 Rooms
7.	Hotel adjacent to coastal area	³ 40 Rooms
8.	National road construction	³ 100 Kilometers
9.	Railway construction	All sizes
10.	Port construction	All sizes
11.	Air port construction	All sizes
12.	Dredging	³ 50,000 m <sup>3</sup>
13.	Damping site	³ 200,000 people

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