



## **Chairman's Statement**



On behalf of the Board of Directors, I would like to express sincere appreciation to EDC for bringing out its Annual Report for the year 2014. We are proud and appreciative of the achievements of EDC during 2014 and strongly believe that EDC is moving towards its

goal and vision to be the foremost power utility in Kingdom of Cambodia that builds deep customer relationship with a reputation for supplying reliable and affordable electricity to its valuable customers.

The Board of Directors takes great pride in acknowledging the huge success of the EDC management and staff. The cumulative achievements in the recent years have been unprecedented.

On this occasion, I wish to extend my personal heartfelt thanks to the management and staffs of EDC who have worked tirelessly to create many enduring achievements. It is through their dedication and hard work that EDC is well placed to realize its vision and goals.

A handwritten signature in blue ink, appearing to read 'Victor Jona'. The signature is stylized and fluid.

**Victor Jona**

**Chairman of the Board**

## **From RGC Delegate in charge of Managing EDC**



Once again, it gives me a real pride to present the annual report for the year 2014. The vision of Electricité du Cambodge (EDC) is to become the leading power utility in the Kingdom of Cambodia, to strive to meet the customers' load demands, and to improve the quality and reliability of supply.

During 2014, our energy sale was increased by 19.18% over the previous year to reach 4,151.73 GWh. Meanwhile, our system loss was reduced to 8%. Our revenue grew by 13% over the previous year to reach 3,013 Billion Riels. We have a combined workforce of 3,585 staff members serving 541,141 customers.

During 2014, 338 MW Lower Stung Russei Chrum Hydropower Plant, 135 MW first unit of 270 MW Coal-fired Power Plant and 246 MW Stung Tatay Hydropower Plant have been finished and put in operation, which connected and supplied to the National Grid via 230 kV transmission line passing through Ou Saom and Stung Hav Substations to Phnom Penh. The import from Vietnam via 230 kV as agreed to increase up to 200 MW in order to meet the demands.

11 km long 115 kV transmission line from Stung Hav to Preah Sihanouk Substation funded by JICA loan and 12 km long 115 kV transmission line from Chhouk to Banteay Meas Substation funded from EDC's budget have been put in operation.

Medium voltage lines of total length of about 2,000 km in four provinces of Kampong Cham, Prey Veng, Kampong Speu, and Preah Sihanouk were commissioned under the rural electrification projects funded by China Exim Bank loan.

In addition, the construction of medium voltage lines of about 1,200 km covering 6 provinces of Kratie, Stung Treng, Rattanakiri, Mondulkiri, Oddar Meanchey, and Siem Reap have been started under the rural electrification project phase II with funds from Royal Government of Cambodia. The project is expected to be completed in 2016. Preliminary work for construction of more than 2,040 km of distribution line and 220 km of transmission line in 14 provinces of Kandal, Kampong Speu, Kampong Chhnang, Pursat, Siem Reap, Oddar Meanchey, Preah Vihea, Kampong Cham, Kratie, Stung Treng, Rattanakiri, Mondulkiri, Koh Kong, and Preah Shihanouk are underway, for which loan is sanctioned by China Exim Bank in Phase 2, 3, and 4.

Moreover, license holders (licensees) who provide electricity in their areas have signed 123 power purchase agreements with EDC as rural electricity enterprises (REEs) for bulk supply of electrical energy from the National Grid so that they can stop operating their small generators whose production cost is high.

This year, EDC has provided the grant of 6 Million USD to Department of Rural Electrification Fund (REF) to continue its encouragement and development of rural electrification sector in the whole country via EDC's fund-providing policy.

The above efforts have resulted in many direct and indirect benefits for several hundred thousands of households and businesses across the country. This is clearly a concrete and real progress in helping Cambodia build a stronger foundation for sustainable economy and social development.

We would like to take this opportunity to acknowledge the contribution and commitment of all our employees who have played such an indispensable role in the success of this organization. We are highly indebted to the great guidance and wisdom given to us by **Samdech Aka Moha Sena Padey Techo Hun Sen, Prime Minister of the Kingdom of Cambodia**, who always provides key supports at every major turning point.

We are also grateful to the Ministry of Mines and Energy for their ongoing sectorial direction and relentless efforts and to the Ministry of Economy and Finance for their support. Our special appreciation goes to the Electricity Authority of Cambodia for its valuable input and support and to the Board of Directors of EDC. We also highly value the support of all our client groups. In addition, we highly appreciate the continuing assistance extended to us by all development partners and a good professional and cooperative relationship by all Independent Power Producer (IPP) partners.

With these achievement and encouragement, we are ready to bring EDC and the power sector to higher level of development. We hold high hope for better days ahead.



**Keo Rottanak**

**RGC Delegate in charge of Managing EDC**

## **VISION**

EDC's vision is to become the leading power utility in the Kingdom of Cambodia by striving to meet the customers' demands and to improve the quality and reliability of supply.

## **MISSION**

Provide sufficient and consistently reliable power supply to consumers in its entire coverage areas at a competitive price. Improve the business operation to excellence and efficiency and participate in implementation of the government's policies on poverty reduction, environmental preservation, and socio-economic development.

## **FUNCTION AND RESPONSIBILITIES**

**EDC** has the rights and responsibilities for generating, transmitting and distributing electricity throughout the Kingdom of Cambodia in conformity with its commercial obligations stipulated by laws, statute, license and other regulations of the Royal Government of Cambodia.

**EDC** operates as a commercial enterprise with independence to organize its business of generation, transmission and distribution of electricity and make capital investments, in appropriate response to market requirements and earn profit and raise productivity.

**EDC** is required to abide by the conditions of its license issued by the Electricity Authority of Cambodia (EAC) in providing electricity service. **EDC** is required to achieve its objectives by implementing its business plan approved by its Board of Directors and in accordance with the national energy policy and national development plan.

**EDC** shall limit its business activities to the types stipulated in its Statute and license granted by EAC.

**EDC** is permitted to be responsible for:

- 1- Generating, transmitting, and distributing electric power with the purpose of meeting the demand of all categories of buyers;
- 2- Exporting electric power to neighboring countries and import electricity from neighboring countries;
- 3- Constructing and operating national electric grid for energy transmission in order to ensure adequate and quality supply;
- 4- Constructing and operating sub-transmission system for distribution of electricity and facilitate connections and operations between EDC and other distribution systems;
- 5- Selling electric power and other related services;
- 6- Purchasing, transferring, and exchanging electricity from other generators.

**EDC** has its source of capital from:

- 1- Grant contribution from the Royal Government;
- 2- Assets and land transferred by the Royal Government to EDC as per Article 7 of the Sub-Decree No. 23;
- 3- Capital generated from revenue as per the accounting rules of EDC;
- 4- Grant and other financing received by EDC with approval from the Officers;
- 5- Finance received by EDC from other financial sources with the approval of the Officers.

## **EVOLUTION OF ELECTRICITE DU CAMBODGE**

Electricity has come to Cambodia in 1906. Before October 1958, power and light in Cambodia were provided by three private companies:

- Compagnie des Eaux et Electricité (CEE)
- Union d'Electricité d'Indochine (UNEDI)
- Compagnie Franco-Khmère d'Electricité (CFKE).

The CEE served the Greater Phnom Penh Area. The UNEDI took care of all other provinces, except Battambang. The CFKE had been serving Battambang-city all along.

By virtue of Kret N° 665-NS of October 10, 1958, the first two companies, CEE and UNEDI, merged under the name of ELECTRICITE DU CAMBODGE.

During 1970 to 1979, the power sector in the country passed through two dangerous events: civil war (1970-1975) and turbulent history during the Khmer Rouge Regime (1975-1979). During this time, all kinds of generation, transmission and distribution facilities were destroyed not only in Phnom Penh but also in other areas.

In 1979, EDC was re-integrated into an administrative structure under Ministry of Industry and then transferred to Phnom Penh Municipality in 1991, by the name Electricité de Phnom Penh (EDP) to manage the electric supply in Phnom Penh while the electric generations in the provinces were managed by the Department of Industry of the provincial authorities.

In 1992, EDP was re-named Electricité du Cambodge and was attached to the Ministry of Energy. After election in 1993, EDC was restructured under the Ministry of Industry, Mines and Energy (MIME) and was responsible for the development, management, and operation of the power system in Phnom Penh. Power utilities in a few provinces continue to remain under the control of Provincial Authorities, which receive budgetary support through MIME.

In March 1996 by the Royal Decree # 0396/10, Electricité du Cambodge became an autonomous wholly state-owned limited liability company to generate, transmit and distribute electric power throughout Cambodia. EDC is a judicial organization with administrative, financial, and managerial autonomy. EDC is responsible for its profits and losses and liable for its debts to the extent of the value of its assets.

## **MANAGEMENT STRUCTURE**

On behalf of the Royal Government of Cambodia, the Ministry of Mines and Energy and the Ministry of Economy and Finance are co-owners of the EDC.

### **Board of Directors**

As of 2014, EDC's Board comprises of the following seven members:



**H.E. Victor Jona**  
Chairperson  
Representative of the Ministry of Mines and Energy



**H.E. Keo Rottanak**  
Member  
RGC Delegate in charge of Managing EDC  
Advisor to the Prime Minister



**H.E. Chan Sothy**  
Member  
Representative of the Ministry of Economy and Finance



**H.E. Hem Kranh Tony**  
Member  
Representative of the Council of the Ministers



**Mr. Hang Touch**  
Member  
Representative of EDC's Employees



**Mr. Ku Khemlin**  
Member  
Representative of the Ministry of Justice



**Ms. Sok Sotheavy**  
Member  
Representative of the Chamber of Commerce of Cambodia.

### **EDC's Management**

EDC is headed by a RGC Delegate in charge of Managing EDC, with the ranking equivalence of a Secretary of State in the Government who reports to the Board of Directors, which in turn reports to the shareholding Ministers. EDC's Managing Director is assisted by four Deputy Managing Directors, and nine Executive Directors. As of 2014, the Management Level of EDC comprises of:



**H.E. Keo Rottanak**  
RGC Delegate in charge of Managing EDC  
Advisor to the Prime Minister



**Dr. Praing Chulasa**  
Deputy Managing  
Director  
Planning and Technique



**Mr. Chhung Ung**  
Deputy Managing  
Director  
Finance and Business



**H.E. Eng Kunthea**  
Deputy Managing  
Director Administration  
and Training



**Mr. Keo Virac**  
Deputy Managing  
Director Rural  
Electrification Fund





**Mr. Chun Piseth**  
Executive Director  
Dept of Corporate Planning and Projects



**Miss. Sin Sovanny**  
Executive Director  
Dept of Finance and Accounting



**Mr. Ly Tikhea**  
Executive Director  
Dept of Administration



**Mr. Nou Sokhon**  
Executive Director  
Dept of Transmission



**Mr. Aun Hemrith**  
Executive Director  
Dept of Generation



**Mr. Chea Sinhel**  
Executive Director  
Dept of Business and Distribution



**Mr. Nget Sokhan**  
Executive Director  
Dept of Procurement

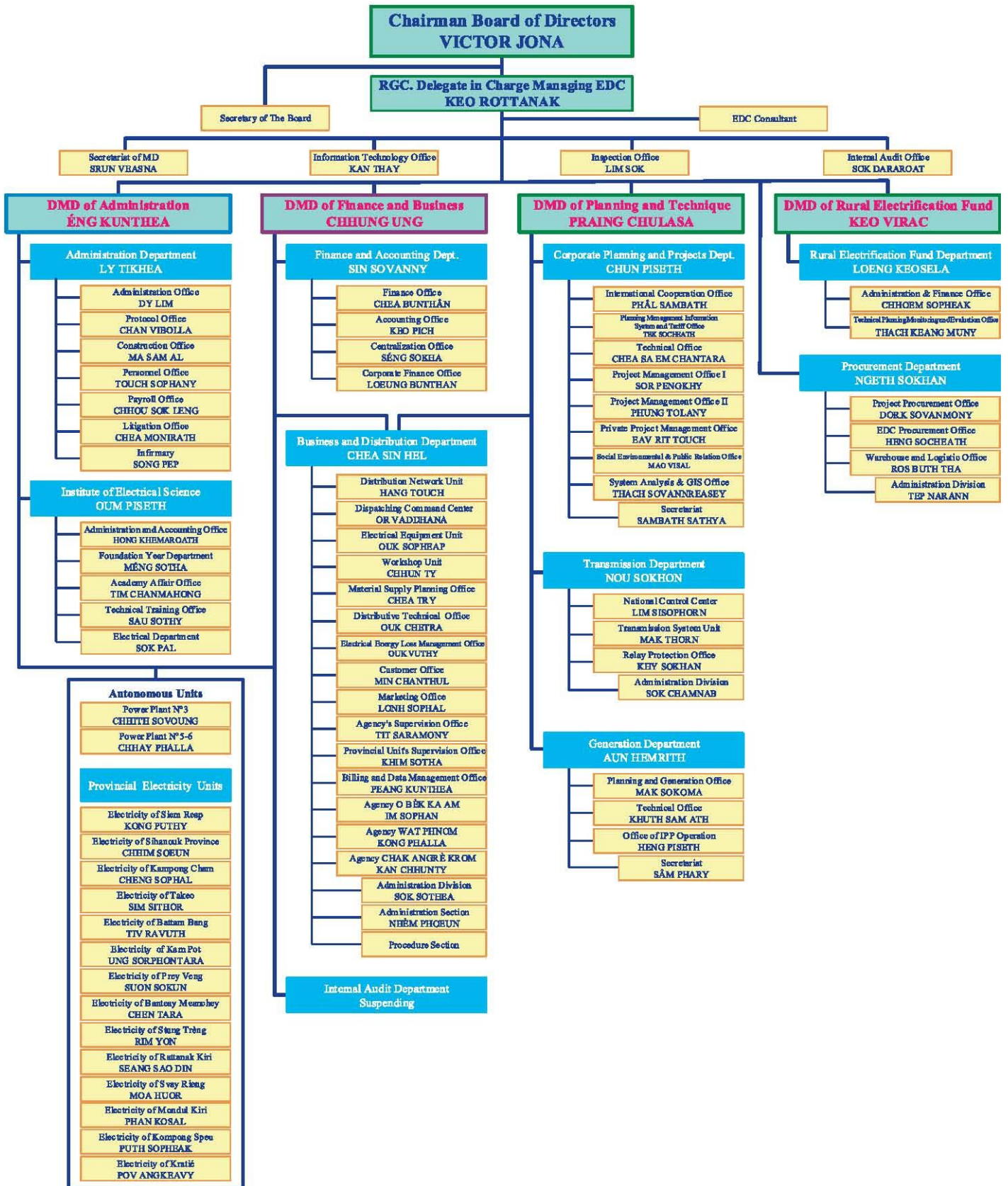


**Mr. Oum Piseth**  
Executive Director  
Institute of Electrical Science



**Mr. Loeung Keosela**  
Executive Director  
Dept of Rural Electrification Fund

# Organization Chart of EDC



## HUMAN RESOURCE DEVELOPMENT

In 2014, 1,007 trainees have been trained in 132 batches and 85 courses at EDC's Institute of Electrical Science. The breakups of the trainees for different trainings are: 254 trainees on distribution network, 55 trainees on Power Plant Protection, 169 trainees on metering, 204 trainees on safety, 81 trainees on generation, 147 trainees on high voltage transmission line, 52 trainees on software program and 45 trainees on technical English.

EDC is also collaborating with other educational institutes for training in order to improve the quality of work and provide new knowledge to its staff.

**Table 1: EDC's Staff from 2009 to 2014**

Type	2009	2010	2011	2012	2013	2014
Doctorate	1	1	2	3	4	4
Post-graduated	91	104	119	142	141	151
Engineer & other graduated	446	551	672	822	934	1078
Vocational Technicians	358	390	429	493	570	736
Skilled Workers	245	246	207	188	180	178
High school, Unskill	1,219	1,278	1,331	1,287	1,398	1,438
<b>Total</b>	<b>2,360</b>	<b>2,570</b>	<b>2,760</b>	<b>2,935</b>	<b>3,227</b>	<b>3,585</b>

EDC's Management has the following vision for the betterment of its employees:

- To provide its employees with opportunities for professional growth and advancement on the basis of their performance, integrity and loyalty to EDC.
- To provide its employees with competitive remuneration and benefits to ensure good living conditions.
- To guarantee fairness, equal treatment and opportunity to employees, to maximize their contribution to the development of EDC.
- To provide suitable working conditions that facilitate an open and honest communication of information among employees to promote teamwork, productivity and cooperation for the organization's growth.

### IMPORT FROM THAILAND AND VIETNAM AT HIGH VOLTAGE

EDC imports power from Thailand through 115 kV Aranya Prathet - Banteay Meanchey line which supplies to Banteay Meanchey, Battambang and Siem Reap grid substations. During 2014, EDC has imported 350,071,600 kWh from Thailand.

The 230 kV double circuit transmission line from Vietnam to Takeo was commissioned on 31<sup>st</sup> March 2009. The 230 kV double circuit line from Takeo to GS4 in Phnom Penh was charged on 8<sup>th</sup> May 2009. During 2014, EDC has imported 878,533,240 kWh from Vietnam via the above transmission line. This transmission line has been linked the lines and substations already constructed in Battambang, Pursat, Kampong Chhnang, and Phnom Penh. It will be linked to transmission lines which are under construction such as a 230 kV transmission line from Takeo province to Kampot province, a line from Kampot province to Preah Sihanouk province, and a line from Phnom Penh to Kampong Cham province. The whole network will become the National Grid.

## **THE AREAS OF OPERATION, THEIR DEMAND & SUPPLY**

The areas of operation of EDC and the position of demand and supply during the year 2014 are described below:

**PHNOM PENH (PHN), AND SUB-URBAN AREA:** Phnom Penh is the capital city of Cambodia. In this report the system supplied from GS1, GS2, GS3, GS4, GS5, GS6, and GS7 is termed as Phnom Penh System. The EDC Phnom Penh's coverage area includes Phnom Penh and the suburban areas around Phnom Penh in Kandal Province.

Phnom Penh System get power supply from National Grid, IPPs and its own power plants (EDC). The installed capacity of IPPs is 1,483.90 MW, import from Vietnam is about 200 MW and EDC's power plants is 44 MW which mostly use for standing by.

As of 2014, for the Phnom Penh System, the peak demand is 563.38 MW. The supply from EDC's power purchase from National Grid and import in Phnom Penh System has increased from 3,398.10 GWh in 2013 to 4,268.88 GWh in 2014 and the system loss has increased from 8.23% in 2013 to 9.56% in 2014.

**SIEM REAP (SRP):** Siem Reap is the area of tourist attraction and located in the northwest part of Cambodia. Electricity supply in Siem Reap is from its own power plant and import from Thailand.

The main operational features of power system in Siem Reap for 2014 are: available capacity 90.50 MW, peak demand 59.39 MW, energy source in the entire system purchases from the National Grid, imports from Thailand at 115/22kV substation and own generation 346.46 GWh, total length of MV and LV lines 808.08 cct-km and number of customers 36,694.

**PREAH SIHANOUK (SHV):** Preah Sihanouk province is the most stunning seaside tourist area, located in the southwestern part of Cambodia. Earlier the power system in Preah Sihanouk province was isolated and was supplied by Power Plants of IPP and EDC, together having an installed capacity of 19.60 MW. In 2014, under RETP project, the system has been connected and one part of its system has been supplying by Kampot system, which purchases from the National Grid and imports power from Vietnam via a 22 kV line. This has increased the availability of power resulting in supply to more areas and to other licensees in Preah Sihanouk province. The annual power purchase is 147.19 GWh, and peak demand 29.50 MW. The line length of MV and LV network is 362.16 cct-km and the number of customers in EDC distribution area are 14,238.

**KAMPONG CHAM (KGC):** Kampong Cham is the most fertile rubber plantation areas, located in the eastern part of Cambodia. The power system in Kampong Cham is supplied by the National Grid and IPPs while some parts of the system has received imported power from Vietnam. As of 2014, the annual power purchase is 44.86 GWh, installed capacity 9.18 MW, peak demand 13.60 MW. The line length of MV and LV network is 667.06 cct-km with 14,876 customers.

**MEMOT (MMT) AND PONHEA KREK (PKK):** The supply system for Memot and Ponhea Krek is located in Kampong Cham province and has MV system with rated voltage of 22 kV. The power supply to these areas has been imported from Vietnam since 2002 with the contracted capacity of 10 MW. As of 2014, the import has been 46.13 GWh. The system has total MV and LV lines of 279.42 cct-km, and peak demand of 9.89 MW and 8,587 customers.

**BATTAMBANG (BTB):** Battambang has a strong agricultural economy with rice as its primary crop and is the leading rice production province, located in the north-western part of Cambodia. The 115 kV transmission line for importation of power from Thailand is connected with Siem Reap and Banteay Meanchey systems which link to the National Grid. Battambang city is supplied power by importing from Thailand and by its own power plant. The Battambang power system has installed capacity 21.60 MW, total MV and LV lines 690.89 cct-km. The power purchase for 2014 is 170.03 GWh, peak demand 26.49 MW, and 42,336 customers.

**BANTEAY MEANCHEY (BTC) AND MONGKUL BOREI:** Banteay Meanchey is located in the northwestern part of Cambodia. Banteay Meanchey is supplied power by purchased power from National Grids, importing from Thailand and its own power plant. The installed capacity of power system is 23.08 MW. As of 2014, the power purchase is 75.30 GWh, peak demand 19.36 MW. The line length of MV and LV network is 263.46 cct-km and 19,217 customers has been connected.

**STUNG TRENG (STR):** Stung Treng is a remote and sparsely populated province located in the northeast of Cambodia. The power system of Stung Treng town has been connected to the Laos system at 22 kV since 2010. The system has installed capacity 5.64 MW (1.64 MW its own power plant and 4 MW imported from Laos), total MV and LV lines 239.57 cct-km. The peak demand in 2014 is 4.85 MW and the available energy is 13.91 GWh and 5,782 customers.

**RATTANAKKIRI (RTK):** Rattanakiri is situated on the border of Vietnam's central highlands and Laos. The power system of Rattanakiri, with installed capacity of 3.68 MW of IPP and its own hydro generation, 7.50 MW imported from Vietnam via a 35 kV sub-transmission line, has total MV and LV lines 140.75 cct-km. As of 2014, the peak demand is 5.40 MW and annual available energy is 27.91 GWh with 4,722 customers.

**TAKEO (TKO) AND ANG TASOM:** Takeo is located in the plain region of southern Cambodia. The 230 kV line from Vietnam and the Takeo substation was energized on 31<sup>st</sup> March 2009 to import power from Vietnam. As of 2014, Takeo has continued to have its own generation system with an installed capacity of 1.56 MW and 16 MW of import from Vietnam. It has had a peak demand of 18.26 MW, total MV and LV line of 567.12 cct-km, power purchase from its own power plant, import from Vietnam, and from National Grid has been 57.69 GWh and 15,636 customers.

**KAMPOT (KPT):** Kampot is located in the southern part of the country. EDC's own power plant with installed capacity of 3.08 MW and power importation from Vietnam by a 22 kV line via Kampong Trach (KGT) are used for supply to Kampot city. As of 2014, Energy generation from its own power plant, power purchase from National Grid and import from Vietnam has been 46.90 GWh, peak demand 13.30 MW and a distribution system with total MV and LV lines 338.89 cct-km and 11,234 customers.

**KAMPONG TRACH (KGT):** The power system is in Kampot province, and it has imported electricity from Vietnam since 2002. As of 2014 the contracted capacity has been 10 MW and the system has total MV and LV lines 75.65 cct-km, available energy 13.20 GWh, peak demand 2.91 MW and 3,670 customers.

**PREY VENG (PRV):** Prey Veng is located in the south-east of the country. The power system of Prey Veng City comprises of generation with an installed capacity of 4.94 MW by EDC's own generation and supply from Svay Rieng, which, in turn, imports power from Vietnam. The supply system has MV and LV line 789.66 cct-

km, and peak demand of 8.07 MW. The energy available has been 20.91 GWh with 6,110 customers.

**SVAY RIENG (SVR):** Svay Rieng is located in the south-east of the country. The power supply is by importation from Vietnam and its own generation. Available capacity of power system is 8.30 MW. Importation and generation, as of 2014, has been 138.06 GWh with peak demand 8 MW. The line length of MV and LV network is 604.59 cct-km with 13,892 customers.

**BAVET (BVT):** The power system for Bavet is in Svay Rieng province, and the supply is by importation from Vietnam. As of 2014, there have been peak demand of 16.91 MW, imported from Vietnam of 16 MW and the supply system has had 3,802 customers.

**MONDULKIRI (MDKR):** The power system of Mondulkiri was taken over by EDC in 2010. The installed capacity for generation is 370 kW of hydro generation, 300 kW of diesel generation and 1 MW imported from Vietnam. Under EDC control, as of 2014 generation has been 4.30 GWh with peak demand of 1.01 MW. The line length of MV and LV network is 124.52 cct-km and had 2,195 customers.

**KEOSIEMA (KSM):** The power system for Keosiema is in Mondulkiri province. Supply is by import from Vietnam with a contracted capacity of 0.36 MW. Import has been 3.15 GWh with peak demand of 0.74 MW. The line length of MV and LV network is 88.90 cct-km with 1,554 customers.

**KRATIE (KRT):** The power system of Kratie was taken over by EDC in 2011. The isolated power system in Kratie is supplied by IPP and EDC with an installed capacity of 0.55 MW. Under EDC control, as of 2014 generation has been 16.21 GWh with peak demand of 3.15 MW. The line length of MV and LV network is 160.14 cct-km with 4,776 customers.

**SNUOL (SNL):** The power system is in Kratie province. This system is supplied by 4 MW of imported power from Vietnam with annual energy of 10.41 GWh and peak demand of 1.63 MW. The line length of MV and LV network is 33.48 cct-km with 1,238 customers.

**KAMPONG SPEU (KPS):** In mid-2012, Kampong Speu was upgraded to province branch office while it had been under Phnom Penh System previously. This new provincial branch is in charge of the system in Kampong Speu town and the areas along National Road No.4, getting power supply from Kampong Speu substation. Its annual sale energy is 83.44 GWh. The line length of MV and LV network is 825.43 cct-km with 11,159 customers.

**Table 2: Installed Capacity and Output from Power Plants and Import, MW**

Year		2009	2010	2011	2012	2013	2014	
Location	Capacity							
PHN	Installed	453.48	429.48	429.48	633.90	1,219.58	1,727.90	
	Output	317.49	317.89	332.89	571.29	968.19	1,532.89	
EDC	Installed	45.60	44	44	44	44	44	
	Output	42.60	41	41	41	41	41	
CUPL IPP	Installed	37.10	37.10	37.10	37.10	37.10	37.10	
	Output	31.99	31.99	31.99	31.99	31.99	33.50	
Kirirom I IPP	Installed	12	12	12	12	12	12	
	Output	11	11	11	11	11	11	
Kirirom III IPP	Installed	-	-	-	18	18	18	
	Output	-	-	-	18	18	18	
Kamchay IPP	Installed	-	-	-	194.10	194.10	194.10	
	Output	-	-	-	194.10	194.10	194.10	
Atay IPP	Installed	-	-	-	-	120	120	
	Output	-	-	-	-	120	120	
LSRC IPP	Installed	-	-	-	-	338	338	
	Output	-	-	-	-	169	338	
Tatay IPP	Installed	-	-	-	-	-	246	
	Output	-	-	-	-	-	246	
CEL IPP	Installed	-	-	-	-	120	120	
	Output	-	-	-	-	100	100	
CIIDG IPP	Installed	-	-	-	-	-	270	
	Output	-	-	-	-	-	125.09	
KEP IPP	Installed	49.20	49.20	49.20	49.20	49.20	49.20	
	Output	45	45	45	43.20	43.20	43.20	
CITY Power IPP	Installed	7.68	7.68	7.68	-	7.68	-	
	Output	6.90	6.90	6.90	-	6.90	-	
CEP IPP	Installed	49.20	49.20	49.20	49.20	49.20	49.20	
	Output	45	45	45	45	45	45	
COLBEN IPP	Installed	20.20	20.20	20.20	20.20	20.20	20.20	
	Output	10	10	10	10	10	10	
TH IPP	Installed	10	-	-	-	-	-	
	Output	8	-	-	-	-	-	
COLBEN PPSEZ IPP	Installed	12.40	-	-	-	-	-	
	Output	10	-	-	-	-	-	
Suvannaphum IPP	Installed	10.10	10.10	10.10	10.10	10.10	10.10	
	Output	7	7	7	7	8	8	
West PP (VN) IMP	Installed	200	200	200	200	200	200	
	Output	100	120	135	170	170	200	
Provinces		Installed	163.04	174.67	187.09	214.79	217.24	257.24
		Output	156.26	167.89	178.99	206.69	209.89	247.89
SRP	IPP	Installed	-	-	-	-	-	-
		Output	-	-	-	-	-	-
	EDC	Installed	10.50	10.50	10.50	10.50	10.50	10.50
		Output	10.50	10.50	10.50	10.50	10.50	10.50
	IMP	PPA	40	40	40	40	40	80
		Output	40	40	40	40	40	80

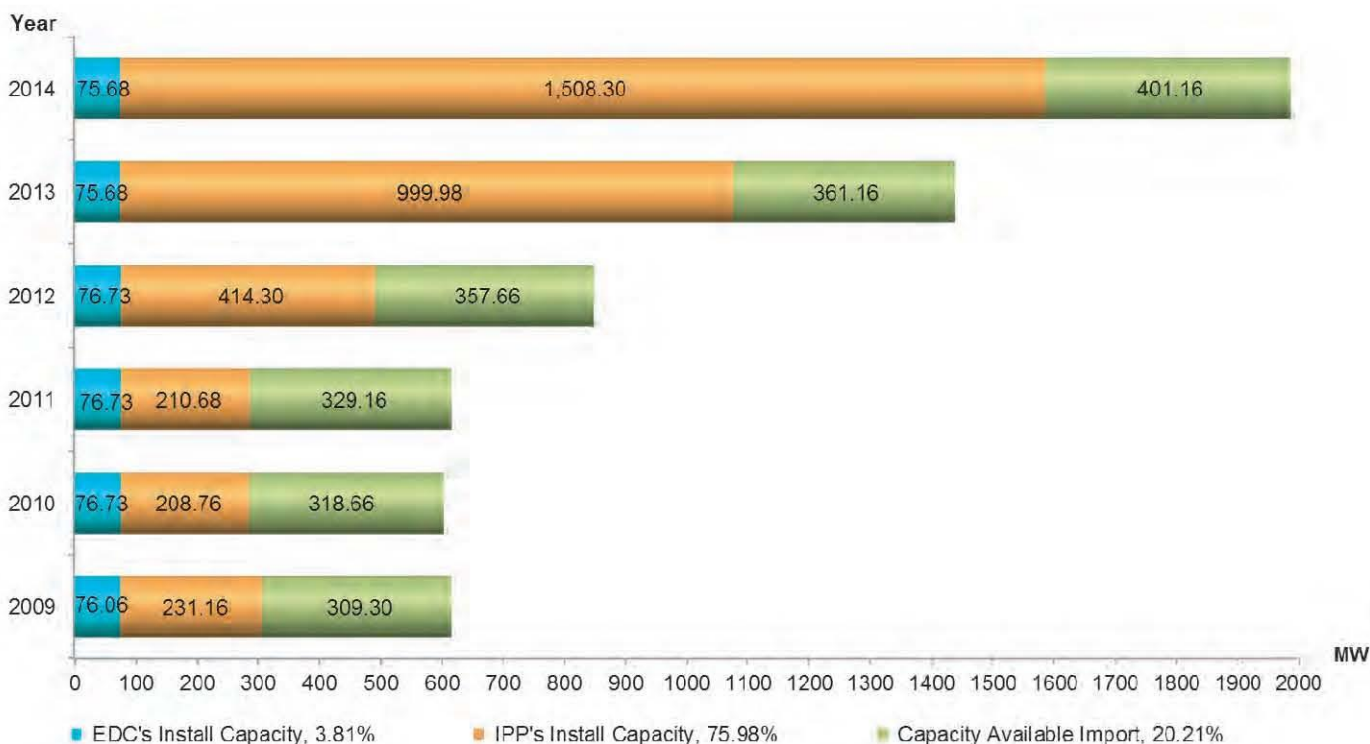
**Table 2: Installed Capacity and Output from Power Plants and Import, MW (Con't)**

Year		Capacity	2009	2010	2011	2012	2013	2014
Location								
SHV	EDC	Installed	5.60	5.60	5.60	5.60	5.60	5.60
		Output	5	5	5	5	5	5
	IPP	Installed	14	14	14	14	14	14
		Output	10	10	10	10	10	10
KGC	IPP	Installed	7.68	7.68	7.68	7.68	7.68	7.68
		Output	7	7	7	7	7	5
	IMP	PPA	-	-	1.50	1.50	1.50	1.50
		Output	-	-	1.50	1.50	1.50	1.50
PKK	IMP	Installed	5	5	5	5	5	5
		Output	5	5	5	5	5	5
MMT	IMP	Installed	5	5	5	5	5	5
		Output	5	5	5	5	5	5
TKO	EDC	Installed	1.56	1.56	1.56	1.56	1.56	1.56
		Output	1.50	1.50	1.50	1.50	1.50	1.50
	IMP	Installed	3	3	4	16	16	16
		Output	3	3	4	16	16	16
BTB	EDC	Installed	1.60	3.20	3.20	3.20	1.60	1.60
		Output	0.80	2.40	2.40	2.40	1.60	1.60
	IPP	Installed	-	-	-	-	-	-
		Output	-	-	-	-	-	-
	IMP	PPA	20	20	20	20	20	20
		Output	20	20	20	20	20	20
KPT	EDC	Installed	3.08	3.08	3.08	3.08	3.08	3.08
		Output	3	3	3	3	3	3
KGT	IMP	Installed	3	10	10	10	10	10
		Output	3	10	10	10	10	10
PRV	EDC	Installed	1.64	1.64	1.64	1.64	1.64	1.64
		Output	1.50	1.50	1.50	1.50	1.50	1.50
	IMP	Installed	0.80	0.80	0.80	0.80	3.30	3.30
		Output	0.80	0.80	0.80	0.80	3.30	3.30
BTC	EDC	Installed	3.08	3.08	3.08	3.08	3.08	3.08
		Output	3	3	3	3	3	3
	IMP	PPA	20	20	20	20	20	20
		Output	20	20	20	20	20	20
STR	EDC	Installed	1.64	1.64	1.64	1.64	1.64	1.64
		Output	1.50	1.50	1.50	1.50	1.50	1.50
	IMP	Installed	-	2	2	4	4	4
		Output	-	2	2	4	4	4
RTK	IPP	Installed	1.60	1.60	0.80	-	-	2.72
		Output	1.40	1.40	0.80	-	-	1.20
	EDC	Installed	0.96	0.96	0.96	0.96	0.96	0.96
		Output	0.96	0.96	0.96	0.96	0.96	0.96
	IMP	Installed	-	-	7	7	7.50	7.50
		Output	-	-	7	7	7.50	7.50

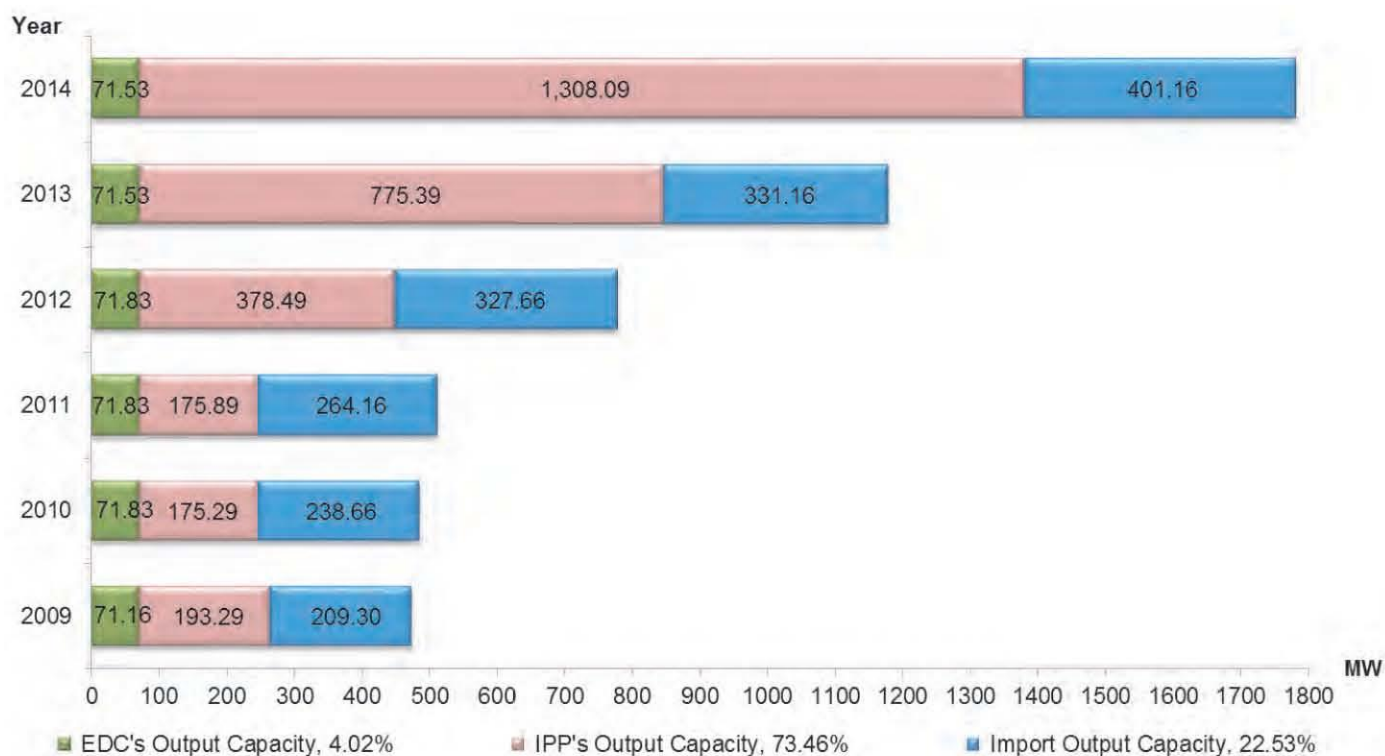


**Table 2: Installed Capacity and Output from Power Plants and Import, MW (Con't)**

Year		Capacity	2009	2010	2011	2012	2013	2014
Location								
SVR	EDC	Installed	0.80	0.80	0.80	0.80	0.80	0.80
		Output	0.80	0.80	0.80	0.80	0.80	0.80
	IMP	Installed	7.50	7.50	7.50	7	7.50	7.50
		Output	7.50	7.50	7.50	7	7.50	7.50
BVT	IMP	Installed	5	5	5	16	16	16
		Output	5	5	5	16	16	16
MDKR	EDC	Installed	-	0.67	0.67	0.67	0.67	0.67
		Output	-	0.67	0.67	0.67	0.67	0.67
	IMP	Installed	-	-	-	1	1	1
		Output	-	-	-	1	1	1
KSM	IMP	Installed	-	0.36	0.36	0.36	0.36	0.36
		Output	-	0.36	0.36	0.36	0.36	0.36
KRT	EDC	Installed	-	-	-	-	0.55	0.55
		Output	-	-	-	-	0.50	0.50
	IPP	Installed	-	-	2.72	2.72	2.72	-
		Output	-	-	1.20	1.20	1.20	-
SNL	IMP	Installed	-	-	1	4	4	4
		Output	-	-	1	4	4	4
Total	Installed		616.52	604.15	616.57	848.69	1,436.82	1,985.14
	Output		473.75	485.78	511.88	777.98	1,178.08	1,780.78
Percentage , %			76.84%	80.41%	83.02%	91.67%	81.99%	89.71%



**Figure 1: Installed Capacity in 2014**



**Figure 2: Output Capacity in 2014**

**Table 3: Energy Generation from Power Plants and Import, GWh**

Year	2009	2010	2011	2012	2013	2014
<b>National Grid</b>	<b>1,692.54</b>	<b>2,098.21</b>	<b>2,389.42</b>	<b>3,081.50</b>	<b>3,422.66</b>	<b>4,227.95</b>
EDC's	82.86	33.08	48.52	58.28	35.86	<b>26.10</b>
CUPL	182.22	120.21	133.41	132.14	73.13	<b>35.14</b>
Jupiter	-	-	-	-	-	-
Kirirom I	44.41	24.21	38.25	29.21	44.57	<b>39.36</b>
Kam Chay	-	-	-	396.38	463.27	<b>423.52</b>
Kirirom III	-	-	-	86.40	90.39	<b>79.62</b>
ATAY	-	-	-	-	267.06	<b>326.67</b>
LRSCR	-	-	-	-	138.15	<b>865.97</b>
TATAY	-	-	-	-	-	<b>103.71</b>
T.H	17.31	-	-	-	-	-
KEP	256.25	230.38	231.90	196.95	139.67	<b>80.13</b>
CITY POWER	34.11	18.23	25.26	15.79	13.14	-
CEP	269.48	247.29	227.70	209.46	143.73	<b>96.35</b>
COLBEN	53.24	35.80	34.17	31.07	19.15	<b>11.16</b>
S.L Garment	5.76	4.05	11.86	10.17	5.52	<b>1.33</b>
COLBEN PPSEZ	45.06	-	-	-	-	-
Suvarnaphum	28.03	32.07	46.50	37.42	29.75	<b>42.63</b>
CEL	-	-	-	-	139	<b>653.80</b>
CIIDG	-	-	-	-	-	<b>166.59</b>

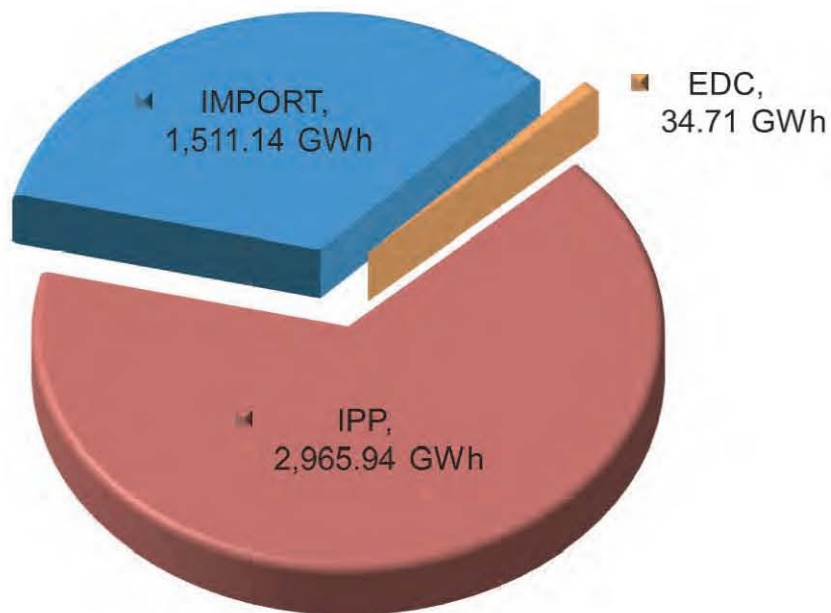
**Table 3: Energy Generation from Power Plants and Import, GWh (Con't)**

Year	2009	2010	2011	2012	2013	2014
Location						
Thai	-	-	-	76.16	416.97	<b>350.07</b>
VN	357.21	954.55	1,120.96	1,198.96	1,329.12	<b>878.53</b>
PP Sugar	-	-	-	1.32	0.65	<b>9.83</b>
SRP	165.20	193.98	214.15	268.43	4.40	<b>5.08</b>
SHV	51.16	64.96	76.22	90.02	25.36	<b>9.17</b>
KGC	25.27	34.95	38.46	57.08	32.06	<b>8.04</b>
TKO	7.39	9.28	13.11	25.72	0.03	<b>0.02</b>
BTB	38.25	49.73	67.83	105.99	0.01	<b>0.01</b>
KPT	10.17	20.82	32.75	14.41	11.51	<b>15.09</b>
BTC	19.16	24.63	28.37	40.13	0.16	<b>0.04</b>
<b>Off Grid</b>	<b>125.31</b>	<b>144.29</b>	<b>174.65</b>	<b>228.54</b>	<b>266.32</b>	<b>283.84</b>
PKK	26.92	25.98	32.27	39.94	39.18	<b>30.32</b>
MMT	10.56	10.40	11.26	14.03	15.67	<b>15.80</b>
KGT	5.39	8.68	14.92	17.05	16.64	<b>13.20</b>
PRV	3.36	4.68	6.60	11.65	15.38	<b>13.44</b>
STR	4.39	5.80	6.65	9.01	10.58	<b>13.91</b>
RTK	6.41	8.19	9.47	17.16	22.73	<b>27.91</b>
SVR	12.91	18.15	23.80	26.99	33.21	<b>136.74</b>
BVT	55.37	60.86	59.35	74.02	87.47	-
MDKR	-	1.10	2.34	2.98	3.39	<b>4.30</b>
KSM	-	0.45	1.03	1.48	2.21	<b>3.15</b>
KRT	-	-	2.32	6.85	10.49	<b>14.86</b>
SNL	-	-	4.64	7.38	9.35	<b>10.20</b>
<b>Total</b>	<b>1,817.85</b>	<b>2,242.49</b>	<b>2,564.07</b>	<b>3,310.05</b>	<b>3,688.99</b>	<b>4,511.79</b>

Note: Energy Transfer Intercompany is 938.62 GWh

**Table 4: Generation Sources from Power Plants and Import during 2014, GWh**

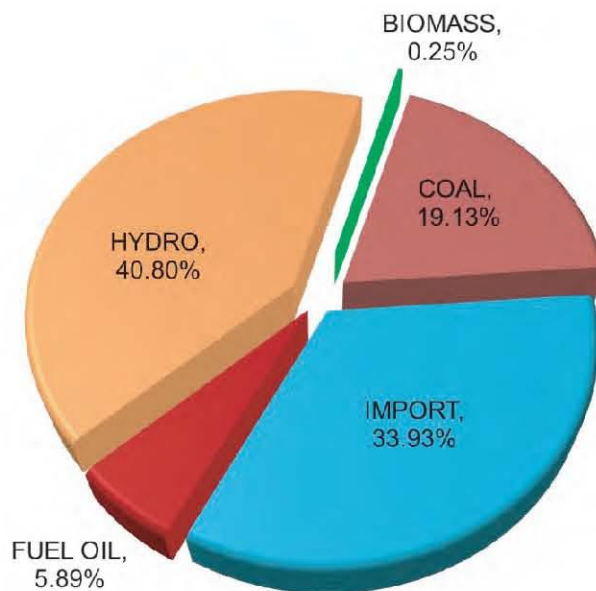
LOCATION	EDC	IPP	IMPORT	TOTAL
<b>National Grid</b>	<b>32.13</b>	<b>2,952.15</b>	<b>1,243.67</b>	<b>4,227.95</b>
<b>EDC p.p</b>	26.10	2,935.80	1,228.60	<b>4,190.51</b>
<b>SRP</b>	5.08	-	-	<b>5.08</b>
<b>SHV</b>	0.86	8.31	-	<b>9.17</b>
<b>KGC</b>	-	8.04	-	<b>8.04</b>
<b>TKO</b>	0.02	-	-	<b>0.02</b>
<b>BTB</b>	0.01	-	-	<b>0.01</b>
<b>KPT</b>	0.03	-	15.07	<b>15.09</b>
<b>BTC</b>	0.04	-	-	<b>0.04</b>
<b>Off Grid</b>	<b>2.58</b>	<b>13.80</b>	<b>267.47</b>	<b>283.84</b>
<b>PKK</b>	-	0.15	30.17	<b>30.32</b>
<b>MMT</b>	-	-	15.80	<b>15.80</b>
<b>KGT</b>	-	-	13.20	<b>13.20</b>
<b>PRV</b>	0.15	13.29	-	<b>13.44</b>
<b>STR</b>	0.14	-	13.77	<b>13.91</b>
<b>RTK</b>	0.53	0.06	27.31	<b>27.91</b>
<b>SVR</b>	0.11	-	136.63	<b>136.74</b>
<b>BVT</b>	-	-	-	<b>-</b>
<b>MDKR</b>	1.65	-	2.65	<b>4.30</b>
<b>KSM</b>	-	-	3.15	<b>3.15</b>
<b>KRT</b>	0.00	0.29	14.57	<b>14.86</b>
<b>SNL</b>	-	-	10.20	<b>10.20</b>
<b>TOTAL</b>	<b>34.71</b>	<b>2,965.94</b>	<b>1,511.14</b>	<b>4,511.79</b>



**Figure 3: Power Generation by Sources in 2014**

**Table 5: Generation by types from Power Plants and Import during 2014, GWh**

LOCATION	FUEL OIL	HYDRO	BIOMASS	COAL	IMPORT	TOTAL
<b>National Grid</b>	<b>264.84</b>	<b>1,838.84</b>	<b>11.16</b>	<b>863.02</b>	<b>1,250.10</b>	<b>4,227.95</b>
<b>EDC p.p</b>	248.88	1,838.84	11.16	863.02	1,228.60	<b>4,190.51</b>
<b>SRP</b>	5.08	-	-	-	-	<b>5.08</b>
<b>SHV</b>	9.17	-	-	-	-	<b>9.17</b>
<b>KGC</b>	1.61	-	-	-	6.42	<b>8.04</b>
<b>TKO</b>	0.02	-	-	-	-	<b>0.02</b>
<b>BTB</b>	0.01	-	-	-	-	<b>0.01</b>
<b>KPT</b>	0.03	-	-	-	15.07	<b>15.09</b>
<b>BTC</b>	0.04	-	-	-	-	<b>0.04</b>
<b>Off Grid</b>	<b>0.85</b>	<b>2.08</b>	-	-	<b>280.91</b>	<b>283.84</b>
<b>PKK</b>	-	-	-	-	30.32	<b>30.32</b>
<b>MMT</b>	-	-	-	-	15.80	<b>15.80</b>
<b>KGT</b>	-	-	-	-	13.20	<b>13.20</b>
<b>PRV</b>	0.15	-	-	-	13.29	<b>13.44</b>
<b>STR</b>	0.14	-	-	-	13.77	<b>13.91</b>
<b>RTK</b>	0.06	0.53	-	-	27.31	<b>27.91</b>
<b>SVR</b>	0.11	-	-	-	136.63	<b>136.74</b>
<b>BVT</b>	-	-	-	-	-	<b>-</b>
<b>MDKR</b>	0.11	1.54	-	-	2.65	<b>4.30</b>
<b>KSM</b>	-	-	-	-	3.15	<b>3.15</b>
<b>KRT</b>	0.29	-	-	-	14.57	<b>14.86</b>
<b>SNL</b>	-	-	-	-	10.20	<b>10.20</b>
<b>TOTAL</b>	<b>265.69</b>	<b>1,840.92</b>	<b>11.16</b>	<b>863.02</b>	<b>1,531.01</b>	<b>4,511.79</b>



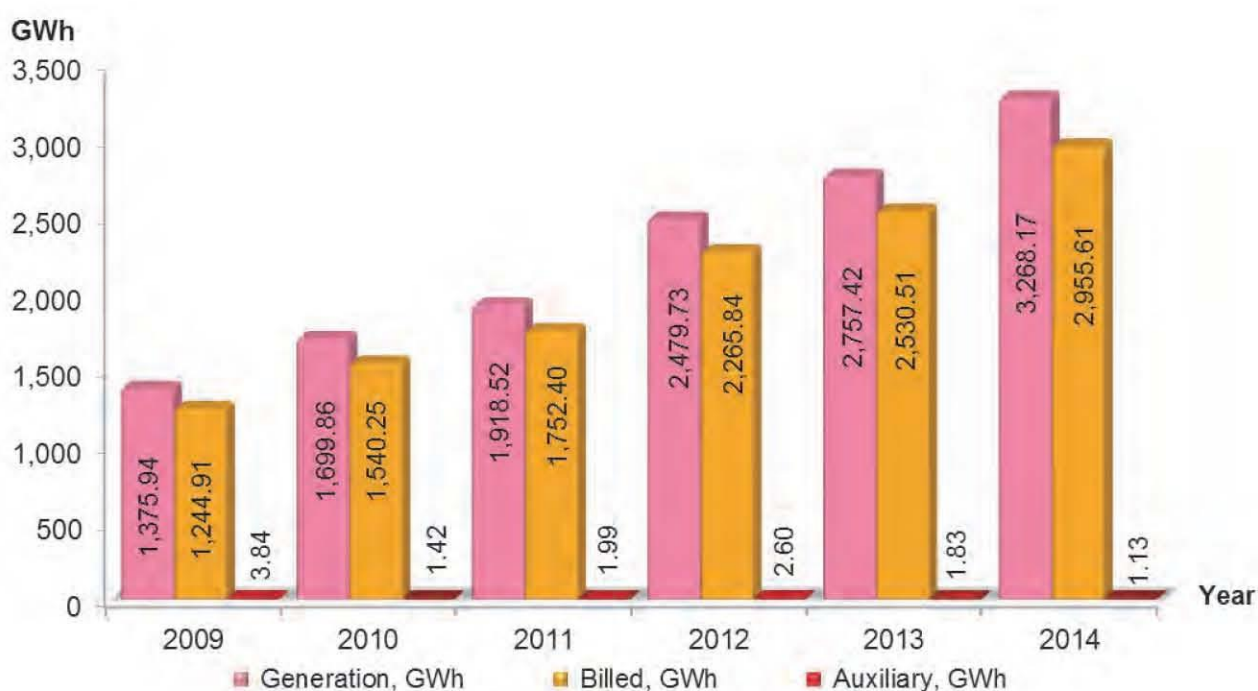
**Figure 4: Generation by type in 2014**

**Table 6: Energy Generation in EDC's System in 2014, GWh**

<b>LOCATION</b>	<b>EDC</b>	<b>IPP</b>	<b>IMPORT</b>	<b>INTERCOMPANY</b>	<b>TOTAL</b>
<b>National Grid</b>	<b>32.13</b>	<b>2,952.15</b>	<b>1,243.67</b>	<b>928.28</b>	<b>5,156.23</b>
<b>EDC p.p</b>	26.10	2,935.80	1,228.60	78.37	<b>4,268.88</b>
<b>SRP</b>	5.08	-	-	341.38	<b>346.46</b>
<b>SHV</b>	0.86	8.31	-	137.61	<b>146.78</b>
<b>KGC</b>	-	8.04	-	36.15	<b>44.19</b>
<b>TKO</b>	0.02	-	-	57.67	<b>57.69</b>
<b>BTB</b>	0.01	-	-	170.02	<b>170.03</b>
<b>KPT</b>	0.03	-	15.07	31.80	<b>46.90</b>
<b>BTC</b>	0.04	-	-	75.26	<b>75.30</b>
<b>Off Grid</b>	<b>2.58</b>	<b>13.80</b>	<b>267.47</b>	<b>10.35</b>	<b>294.19</b>
<b>PKK</b>	-	0.15	30.17	-	<b>30.32</b>
<b>MMT</b>	-	-	15.80	-	<b>15.80</b>
<b>KGT</b>	-	-	13.20	-	<b>13.20</b>
<b>PRV</b>	0.15	13.29	-	7.47	<b>20.91</b>
<b>STR</b>	0.14	-	13.77	-	<b>13.91</b>
<b>RTK</b>	0.53	0.06	27.31	-	<b>27.91</b>
<b>SVR</b>	0.11	-	136.63	1.31	<b>138.06</b>
<b>BVT</b>	-	-	-	-	<b>-</b>
<b>MDKR</b>	1.65	-	2.65	-	<b>4.30</b>
<b>KSM</b>	-	-	3.15	-	<b>3.15</b>
<b>KRT</b>	0.00	0.29	14.57	1.36	<b>16.21</b>
<b>SNL</b>	-	-	10.20	0.21	<b>10.41</b>
<b>TOTAL</b>	<b>34.71</b>	<b>2,965.94</b>	<b>1,511.14</b>	<b>938.62</b>	<b>5,450.41</b>

**Table 7: Breakdown of Yearly Peak Demand, MW**

Location	2009	2010	2011	2012	2013	2014
PHN	244.10	300.20	349.40	410	492.50	563.38
SRP	29.98	34.97	39.07	47.36	56.70	59.39
SHV	10.17	13.40	16.40	18.50	24.80	29.50
KGC	6.80	7.30	8.45	10.45	16.80	13.60
PKK	5.50	5	6.50	6.50	6.50	6
MMT	3	3	3.94	3.94	4.50	3.89
TKO	2.26	2.68	4.73	6.70	8.77	18.26
BTB	7.98	10.45	16.77	20.53	22.78	26.49
KPT	2.36	4.52	5.47	5.34	5.90	13.30
KGT	1.20	2.13	2.38	3.10	3.38	2.91
PRV	0.79	0.93	1.46	3.15	2.73	8.07
BTC	4.32	5.51	6.28	8.82	10.80	19.36
STR	1.08	1.96	2.37	3.22	3.80	4.85
RTK	1.78	1.94	2.24	3.69	4.20	5.40
SVR	2.80	3.70	5.40	5.30	6.67	8
BVT	9.50	11	11.20	15.10	15.60	16.91
MDKR	-	0.46	0.62	0.70	0.86	1.01
KSM	-	-	-	0.38	0.47	0.74
KRT	-	-	2.08	1.18	2.48	3.15
SNL	-	-	-	1.45	1.48	1.63
<b>TOTAL</b>	<b>333.62</b>	<b>409.14</b>	<b>484.76</b>	<b>575.41</b>	<b>691.72</b>	<b>805.84</b>

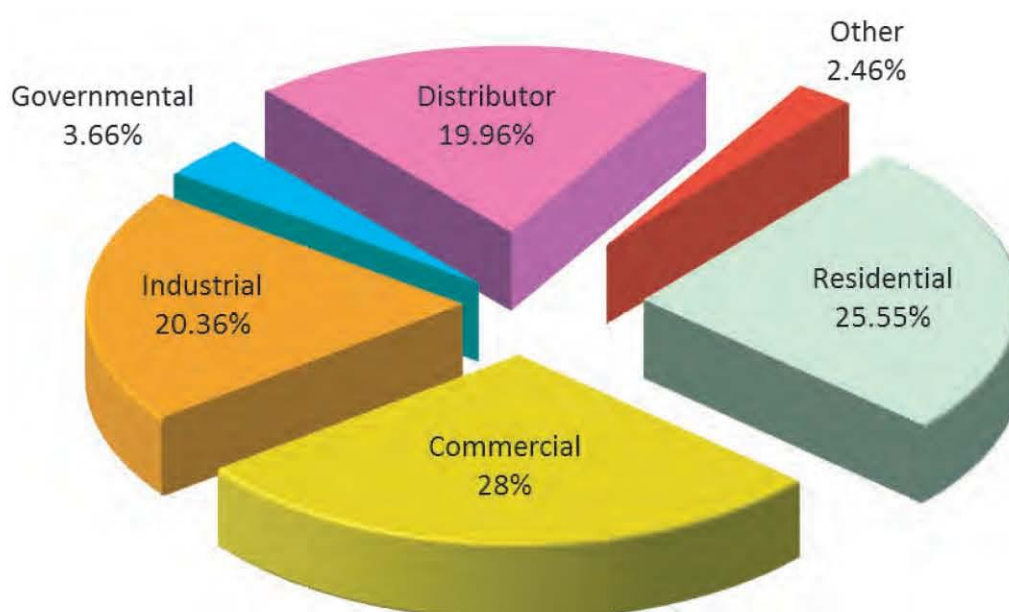


**Figure 5: Breakdown of Generation, Billed and Auxiliary in Phnom Penh System from 2009 to 2014**

**Table 8: Energy Sales, GWh**

Year	2009	2010	2011	2012	2013	2014
<b>PHN</b>	1,246.53	1,540.25	1,752.40	2,265.84	2,530.51	<b>2,955.61</b>
<b>SRP</b>	145.12	170.97	188.26	237.30	270.04	<b>319.33</b>
<b>SHV</b>	45.48	58.13	68.99	79.75	95.92	<b>141.27</b>
<b>KGC</b>	22.23	31.31	34.95	52.30	44.13	<b>43.35</b>
<b>PKK</b>	25.56	24.99	30.63	37.91	37.13	<b>29.37</b>
<b>MMT</b>	10	9.80	10.56	13.12	14.78	<b>14.81</b>
<b>TKO</b>	6.62	8.41	11.91	23.52	36.86	<b>54.43</b>
<b>BTB</b>	34.27	45.41	62.95	98.72	127.46	<b>161.16</b>
<b>KPT</b>	9.09	15.21	30.67	48.59	29.33	<b>44.34</b>
<b>KGT</b>	5.11	8.20	14.62	16.70	16.23	<b>12.92</b>
<b>PRV</b>	2.88	4.17	5.97	10.66	14.39	<b>19.72</b>
<b>BTC</b>	17.28	22.62	26.12	36.50	47.34	<b>71.32</b>
<b>STR</b>	4.10	4.84	5.79	8.08	9.59	<b>12.12</b>
<b>RTK</b>	5.77	7.53	8.67	15.97	21.49	<b>25.97</b>
<b>SVR</b>	11.81	16.51	23.33	23.58	26.37	<b>129.07</b>
<b>BVT</b>	52.22	61.96	55.01	70.65	86.81	-
<b>MDKR</b>	-	0.83	2.09	2.61	3.05	<b>3.85</b>
<b>KSM</b>	-	0.37	1.01	1.48	2.08	<b>3.05</b>
<b>KRT</b>	-	-	2.25	5.92	9.53	<b>15.02</b>
<b>SNL</b>	-	-	2.16	6.49	8.16	<b>10.53</b>
<b>KPS</b>	-	-	15.97	42.27	52.48	<b>84.50</b>
<b>TOTAL</b>	<b>1,644.07</b>	<b>2,031.50</b>	<b>2,354.29</b>	<b>3,097.97</b>	<b>3,483.66</b>	<b>4,151.73</b>

Note: Energy Transfer Intercompany is 938.62 kWh

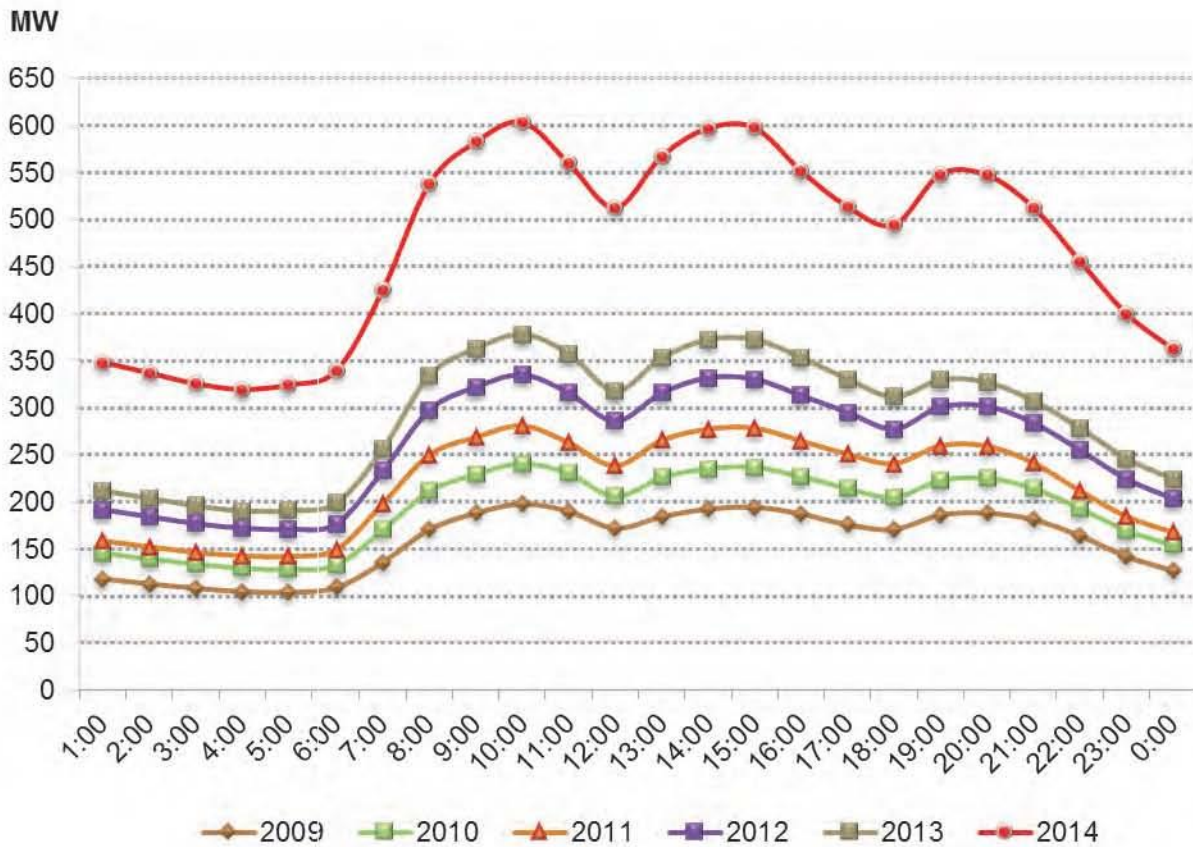


**Figure 6: Energy Sale by Sector for Phnom Penh's System in 2014**



**Table 9: Energy Sales during 2014, GWh**

<b>Year</b>	<b>Energy Sales</b>	<b>Accrued sale</b>	<b>Intercompany</b>	<b>Total</b>
<b>PHN</b>	3,847.20	30.74	(922.33)	<b>2,955.61</b>
<b>SRP</b>	317.28	2.05	-	<b>319.33</b>
<b>SHV</b>	137.77	3.50	-	<b>141.27</b>
<b>KGC</b>	50.08	0.54	(7.27)	<b>43.35</b>
<b>PKK</b>	29.14	0.23	-	<b>29.37</b>
<b>MMT</b>	14.97	0.05	(0.21)	<b>14.81</b>
<b>TKO</b>	53.74	0.69	-	<b>54.43</b>
<b>BTB</b>	160.67	0.49	-	<b>161.16</b>
<b>KPT</b>	50.73	0.82	(7.21)	<b>44.34</b>
<b>KGT</b>	12.83	0.08	-	<b>12.92</b>
<b>PRV</b>	20.66	0.37	(1.31)	<b>19.72</b>
<b>BTC</b>	70.60	0.72	-	<b>71.32</b>
<b>STR</b>	11.92	0.20	-	<b>12.12</b>
<b>RTK</b>	25.33	0.64	-	<b>25.97</b>
<b>SVR</b>	128.34	0.73	-	<b>129.07</b>
<b>BVT</b>	-	-	-	<b>-</b>
<b>MDKR</b>	3.74	0.11	-	<b>3.85</b>
<b>KSM</b>	2.90	0.15	-	<b>3.05</b>
<b>KRT</b>	15.03	0.28	(0.29)	<b>15.02</b>
<b>SNL</b>	10.27	0.26	-	<b>10.53</b>
<b>KPS</b>	83.44	1.05	-	<b>84.50</b>
<b>TOTAL</b>	<b>5,046.64</b>	<b>43.71</b>	<b>(938.62)</b>	<b>4,151.73</b>



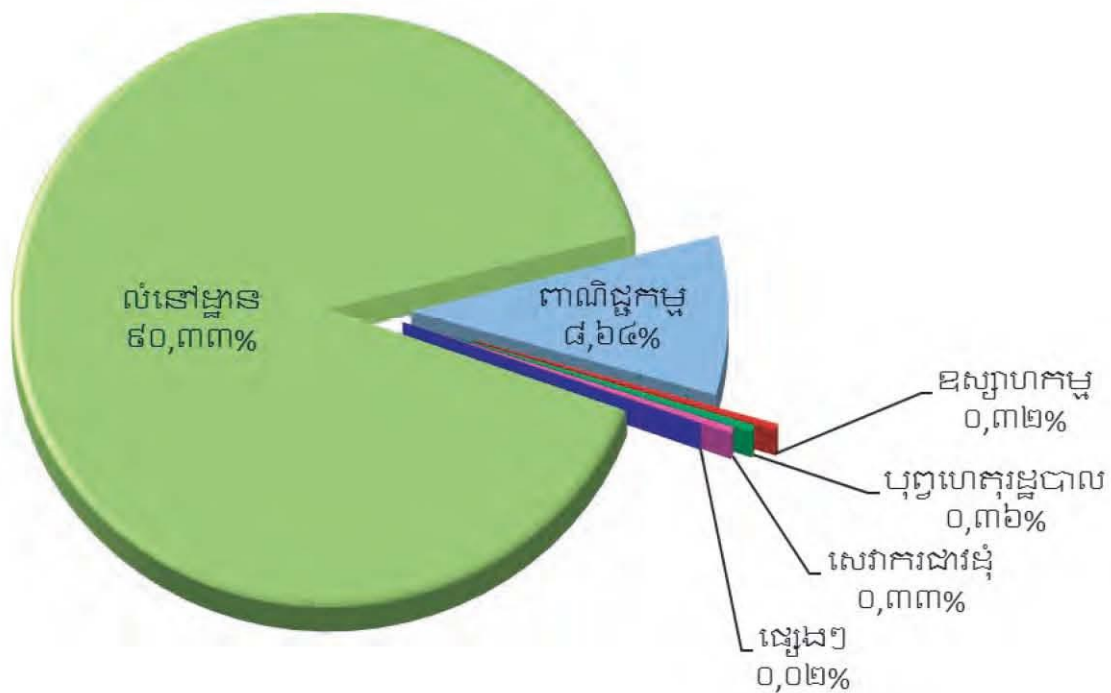
**Figure 7: Average Daily Load Curve from 2009 to 2014 In Phnom Penh**



**Figure 8: System Losses in Phnom Penh System from 2009 to 2014**

**Table 10: Customer from 2009 to 2014**

Year	2009	2010	2011	2012	2013	2014
PHN	224,593	240,992	256,642	276,307	299,774	319,423
SRP	18,229	19,951	26,156	28,791	32,725	36,694
SHV	9,767	10,636	11,472	12,246	13,146	14,238
KGC	8,225	10,478	11,739	12,239	13,003	14,876
PKK	2,210	2,386	2,519	2,694	2,849	2,996
MMT	3,731	4,018	4,285	4,992	5,321	5,591
TKO	5,638	5,987	7,682	11,201	13,081	15,636
BTB	23,902	31,575	32,756	38,498	40,735	42,336
KPT	6,314	7,171	7,796	9,332	10,559	11,234
KGT	2,287	2,515	2,676	2,831	3,499	3,670
PRV	3,554	4,447	4,725	5,538	5,790	6,110
BTC	13,941	14,816	16,085	17,213	18,022	19,217
STR	2,502	2,636	3,090	3,563	4,668	5,782
RTK	2,770	2,910	3,197	3,538	4,233	4,722
SVR	8,565	10,795	11,390	10,298	12,474	13,892
BVT	2,301	2,495	2,562	4,518	3,174	3,802
MDKR	-	1,328	1,444	1,719	2,070	2,195
KSM	-	861	973	1,202	1,337	1,554
KRT	-	-	3,552	3,632	4,404	4,776
SNL	-	-	1,051	1,094	1,167	1,238
KPS	-	-	6,274	9,547	10,828	11,159
<b>TOTAL</b>	<b>338,529</b>	<b>375,997</b>	<b>418,066</b>	<b>460,993</b>	<b>502,859</b>	<b>541,141</b>



**Figure 9: Customer by Type in EDC's System in 2014**

## TRANSMISSION AND DISTRIBUTION NETWORKS

The first 115 kV transmission line of 22.71 km length linking the three grid substations (GS1, GS2 and GS3) in Phnom Penh System was energized in 1999. In 2002, another 115kV transmission line of 111 km length was erected to link Kirirom I Hydro Power Plant to GS1. The main purpose of the 115 kV ring bus line around Phnom Penh is to supply power to Phnom Penh area and to increase the reliability of Phnom Penh system by interlinking three grid substations.

The three provinces in the north-western Cambodia – Battambang, Banteay Meanchey, and Siem Reap – are supplied by 115 kV transmission line of 185 km length by importing power from Thailand, and this line was commissioned at the end of 2007.

In 2009, the first 230 kV transmission line in Cambodian history with 97 km in length to supply to Takeo Grid Substation and the West Phnom Penh Substation (GS4) was put in service getting power supply from Vietnam. The 115 kV transmission line ring system connecting West Phnom Penh Substation (GS4) to the 3 existing substations in Phnom Penh was also put in operation.

In 2011, the 230 kV transmission line with 73 km in length was extended from Takeo Grid Substation to Kampot Grid Substation and linked to Kamchay Hydro power plant with another 230 kV transmission line with a length of 11 km.

The construction of 230 kV transmission line from Phnom Penh to Battambang has started operating since April 2012 with a length of 300 km and another 230 kV transmission line from Osom substation (Koh Kong) to Pursat province substation with a length of 130 km under BOT construction scheme. The construction of 115 kV from 230/115/22 kV substation of CPG (Cambodia Power Grid) to connect with 115 kV substation of CPTL (Cambodia Power Transmission Line) which was put in service on September 01, 2012 permits the National Grid to be able to extend from a part of the southern grid (Phnom Penh, Kandal, Kampong Speu, Takeo, Kampot and Kep) to the northwestern grid (Battambang, Banteay Meanchey and Siem Reap) through Kampong Chhnang and Pursat provinces.

In 2013, the 230 kV transmission line from Kampot to Preah Sihanouk province under ADB and JICA loans with a length of 88 km and another 230 kV transmission line from Phnom Penh to Kampong Cham with a length of 110 km have been put in operation. These projects permit the National Grid to cover two more provinces: Preah Sihanouk and Kampong Cham.

In 2014, 11 km long 115 kV transmission line from Stung Hav to Preah Sihanouk Substation funded by JICA loans and 12 km long 115 kV transmission line from Chhouk to Banteay Meas Substation funded from EDC's budget have been put in operation.

**Table 11: Transmission Facilities**

I	115 kV Transmission line	Circuit	Cross Section (mm <sup>2</sup> )	Line Length (km)	Operation Year	Capital Source
1	GS1 - GS3	1	2x250	11.50	1999	World Bank
2	GS3 - GS2	1	2x250	11.85	1999	World Bank
3	GS1 - GS KPS	1	150	40.93	2002	BOT
4	GS KPS - Kirirom I	1	150	65.04	2002	BOT
5	Thai Border - GS IE	2	400	4	2007	BOT
6	GS IE - GS BMC	2	400	43	2007	BOT
7	GS BMC - GS SR	1	400	85	2007	BOT

**Table 11: Transmission Facilities (Con't)**

I	115 kV Transmission line	Circuit	Cross Section (mm <sup>2</sup> )	Line Length (km)	Operation Year	Capital Source
8	GS BMC - GS BTB	1	400	53	2007	BOT
9	GS4 - GS1	1	2x250	29.80	2009	World Bank
10	GS4 - KEP	1	2x250	22.80	2009	World Bank
11	KEP - GS2	1	2x250	6.60	2009	World Bank
12	Kirirom I - Kirirom III	1	150	32	2012	BOT
13	Atay Hydro Power Plant - GS Osom	2	630	17.80	2013	BOT
14	GS Steung Hav - GS Sihanouk Ville	2	400	11	2014	JICA
15	GS Chhuk - GS Banteay Meas	1	400	12	2014	EDC
<b>Total length</b>				<b>446.32 km</b>		

II	230 kV Transmission line	Circuit	Section (mm <sup>2</sup> )	Line Length (km)	Operation Year	Capital Source
1	Vietnam Border - GS TKO	2	400	50	2009	ADB - NDF
2	GS TKO - GS4 (WPP)	2	630	47	2009	ADB - NDF
3	GS TKO - GS KPT	2	450	73	2011	KfW
4	GS KPT - Kamchay Hydro Power Plant	2	400	11	2012	BOT
5	GS4 - GS6(NPP) - GS Kampong Chhnang - GS Pursat - GS Battambang	2	630	297	2012	BOT
6	GS Pursat - GS Osom	2	630	132	2012	BOT
7	GS KPT - GS Steung Hav(SHV)	2	630	81.62	2013	ADB - JICA
8	GS6(NPP) - GS KGC	2	2x400	97.18	2013	BOT
9	GS Osom - Lower Reussey Chrum Hydro Power Plant	2	2x400	42	2013	BOT
10	Phnom Penh loop line (WPP - SPP)	2	2x630	48	2014	China Exim Bank
11	Lower Upper Reussey Chrum Hydro power - Tatay Hydro Power	2	2x400	38	2014	BOT
<b>Total length</b>				<b>916.80 km</b>		

**Table 12: Grid Substation Facilities**

No.	Grid Substation Name	Rate Voltage (kV)	Number of Transformer	Capacity (MVA)	Operation Year
1	GS1	115/22/15	1	50	1999
		115/22	1	50	
2	GS2	115/22/15	1	50	1999
		115/22	1	50	
3	GS3	115/22	2	50	1999
4	GS KPS	115/22	1	6.3	2002
5	GS BTB	115/22	1	25	2007
6	GS BTC	115/22	1	25	2007
7	GS SRP	115/22	1	50	2007

**Table 12: Grid Substation Facilities (Con't)**

No.	Grid Substation Name	Rate Voltage (kV)	Number of Transformer	Capacity (MVA)	Operation Year
8	GS4 (WPP)	230/115	2	200	2009
		115/22	2	50	
9	GS TKO	230/22	1	16	2009
10	GS KPT	230/22	1	50	2011
11	GS Kampong Chhnang	230/22	1	25	2012
12	GS Pursat	230/22	1	25	2012
13	GS BTB	230/115/22	1	90	2012
14	GS5 (SWS)	115/22	2	50	2013
15	GS Stung Hav	230/22	1	50	2013
16	Additional Capacity of 115 kV GS2, GS3	115/22	1	50	2013
17	Replaceable Capacity of 115 kV GS1	115/22	2	75	2013
18	GS6 (NPP)	115/22	2	50	2013
		230/115	2	200	
19	GS Osom	230/115/22	1	150	2013
20	GS KGC	115/22	1	50	2013
21	GS7 (SPP)	230/115	1	200	2014
		115/22	2	50	
22	GS Chhuk	230/115	1	100	2014
23	GS Sihanouk Ville	115/22	1	50	2014
24	GS Banteay Meas	-	-	-	2014

The voltage of medium voltage systems of EDC generally is 22 kV and low voltage 0.4/0.22 kV. During 2009 and 2010, Distribution network in Phnom Penh, Kampong Speu, Prey Veng, Banlung (Rattanakiri), Stung Treng, and Preah Sihanouk province have been strengthened with 22 kV medium voltage lines. The detailed data of lines of different voltages are shown in the following table.

Medium voltage lines of total length of about 2,000 km in four provinces of Kampong Cham, Prey Veng, Kampong Speu, and Preah Sihanouk were commissioned under the rural electrification projects funded by China Exim Bank loan.

In addition, the construction of medium voltage lines of 1,200 km covering 6 provinces of Kratie, Stung Treng, Rattanakiri, Mondulakiri, Oddar Meanchey, and Siem Reap have been started under the rural electrification project phase II with funds from Royal Government of Cambodia. The project is expected to be completed in 2016. Preliminary work for construction of more than 2,040 km of distribution line and 220 km of transmission line in 14 provinces of Kondal, Kampong Speu, Kampong Chhnang, Pursat, Siem Reap, Oddar Meanchey, Preah Vihea, Kampong Cham, Kratie, Stung Treng, Rattanakiri, Mondulakiri, Koh Kong, and Preah Sihanouk are underway, for which loan is sanctioned by China Exim Bank in Phase 2, 3, and 4.

**Table 13: Distribution Facilities of EDC System**

Location	Item	2009	2010	2011	2012	2013	2014
<b>PHN &amp; Kandal</b>	Line Length, cct-km	1,602.85	1,877.16	2,058.16	2,572.53	3,585.76	3,778.54
	Medium Voltage	741.81	932.64	1,076.08	1,287.26	2,203.55	2,325.34
	Low Voltage	861.04	944.52	982.08	1,285.27	1,382.21	1,453.20
	# MV Substation	1,412	1,591	1,875	2,170	2,385	2,665
	Indoor	-	-	-	-	-	1,076
	Outdoor	-	-	-	-	-	1,589
<b>KPS</b>	Line Length, cct-km	116.22	115.84	128.15	151.67	805.58	825.43
	Medium Voltage	61.32	60.94	74.07	95.88	673.20	683.10
	Low Voltage	54.90	54.90	54.08	55.79	132.38	142.33
	# MV Substation	23	23	62	71	87	95
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	95
<b>SRP</b>	Line Length, cct-km	287.19	417.02	626.10	657.56	736.41	808.08
	Medium Voltage	160.48	192.06	350.32	367.73	414.44	462.26
	Low Voltage	126.71	224.96	275.78	289.83	321.97	345.82
	# MV Substation	95	126	158	184	196	230
	Indoor	-	-	-	-	-	132
	Outdoor	-	-	-	-	-	98
<b>SHV</b>	Line Length, cct-km	173.78	283.83	297.70	297.70	304.37	362.16
	Medium Voltage	99.32	203.36	203.96	203.96	207.96	265.78
	Low Voltage	74.46	80.47	93.74	93.74	96.41	96.38
	# MV Substation	69	144	155	178	187	281
	Indoor	-	-	-	-	-	51
	Outdoor	-	-	-	-	-	230
<b>KGC</b>	Line Length, cct-km	52.60	141.62	144.01	145.45	149.69	667.06
	Medium Voltage	22.84	50.80	50.97	51.28	51.60	548.06
	Low Voltage	29.76	90.82	93.04	94.17	98.09	119.00
	# MV Substation	31	52	59	59	64	141
	Indoor	-	-	-	-	-	6
	Outdoor	-	-	-	-	-	135
<b>PKK</b>	Line Length, cct-km	33.35	39.55	43.85	45.02	45.17	63.73
	Medium Voltage	22.55	23.59	26.90	27.12	27.12	45.68
	Low Voltage	10.80	15.96	16.95	17.90	18.05	18.05
	# MV Substation	29	27	31	31	21	33
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	33
<b>MMT</b>	Line Length, cct-km	45.17	46.37	46.46	46.46	48.24	215.69
	Medium Voltage	23.10	23.10	23.17	23.17	23.17	189.44
	Low Voltage	22.07	23.27	23.29	23.29	25.07	26.25
	# MV Substation	30	31	37	37	24	25
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	25
<b>TKO</b>	Line Length, cct-km	104.17	105.93	280.14	280.14	367.96	567.12
	Medium Voltage	31.29	31.77	158.31	158.31	158.31	315.77
	Low Voltage	72.88	74.16	121.83	121.83	209.65	251.35
	# MV Substation	31	31	101	104	113	167
	Indoor	-	-	-	-	-	17
	Outdoor	-	-	-	-	-	150

**Table 13: Distribution Facilities of EDC System (Con't)**

Location	Item	2009	2010	2011	2012	2013	2014
BTB	Line Length, cct-km	216.21	248.73	642.89	642.91	691.53	690.89
	Medium Voltage	44.05	74.89	401.03	401.03	444.19	444.19
	Low Voltage	172.16	173.84	241.86	241.88	247.34	246.70
	# MV Substation	96	79	227	228	240	240
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	240
KPT	Line Length, cct-km	94.78	147.67	289.86	338.89	338.89	338.89
	Medium Voltage	32.77	68.42	205.61	226.64	226.64	226.64
	Low Voltage	62.01	79.25	84.25	112.25	112.25	112.25
	# MV Substation	30	38	71	90	105	105
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	105
KGT	Line Length, cct-km	39.93	45.18	45.42	60.02	75.65	75.65
	Medium Voltage	21.68	25.05	25.05	39.45	46.78	46.78
	Low Voltage	18.25	20.13	20.37	20.57	28.87	28.87
	# MV Substation	12	24	31	36	44	44
	Indoor	-	-	-	-	-	1
	Outdoor	-	-	-	-	-	43
PRV	Line Length, cct-km	83.19	100.27	100.27	112.44	473.96	789.66
	Medium Voltage	47.79	53.12	53.12	55.62	417.14	730.84
	Low Voltage	35.40	47.15	47.15	56.82	56.82	58.82
	# MV Substation	14	17	17	20	21	194
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	194
BTC	Line Length, cct-km	146.69	136.40	159.71	171.32	173.91	181.24
	Medium Voltage	33.66	29.50	41.42	46.26	48.85	51.08
	Low Voltage	113.03	106.90	118.29	125.06	125.06	130.16
	# MV Substation	32	33	39	50	55	60
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	60
MKB	Line Length, cct-km	46.95	49.60	63.89	82.22	82.22	82.22
	Medium Voltage	14.25	15.37	29.66	45.48	45.48	45.48
	Low Voltage	32.70	34.23	34.23	36.74	36.74	36.74
	# MV Substation	13	17	26	35	35	39
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	39
STR	Line Length, cct-km	111.43	74.06	132.93	132.93	202.43	239.57
	Medium Voltage	77.18	39.81	92.18	92.18	132.08	150.56
	Low Voltage	34.25	34.25	40.75	40.75	70.35	89.01
	# MV Substation	12	14	25	23	37	48
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	48
RTK	Line Length, cct-km	56.02	54.12	124.42	130.30	138.70	140.75
	Medium Voltage	24.28	20.29	90.18	90.25	91.74	91.75
	Low Voltage	31.74	33.83	34.24	40.05	46.96	49.00
	# MV Substation	13	14	30	50	72	85
	Indoor	-	-	-	-	-	1
	Outdoor	-	-	-	-	-	84



**Table 13: Distribution Facilities of EDC System (Con't)**

<b>Location</b>	<b>Item</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>SVR</b>	Line Length, cct-km	212.37	218.36	406.17	417.51	419.09	604.59
	Medium Voltage	121.99	127.98	314	325.34	325.34	466.08
	Low Voltage	90.38	90.38	92.17	92.17	93.75	138.51
	# MV Substation	40	53	56	71	54	76
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	76
<b>BVT</b>	Line Length, cct-km	30.35	31.74	39.68	173.99	185.56	-
	Medium Voltage	11.21	11.21	11.95	141.19	141.24	-
	Low Voltage	19.14	20.53	27.73	32.80	44.32	-
	# MV Substation	32	35	50	50	21	-
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	-
<b>MDKR</b>	Line Length, cct-km	-	61.67	64.48	109.39	120.39	124.52
	Medium Voltage	-	29.67	32.24	68.93	72.93	77.06
	Low Voltage	-	32	32.24	40.46	47.46	47.46
	# MV Substation	-	40	42	49	54	55
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	55
<b>KSM</b>	Line Length, cct-km	-	44	44	63.65	77.91	88.90
	Medium Voltage	-	20	20	32.50	45.80	47.96
	Low Voltage	-	24	24	31.15	32.11	40.94
	# MV Substation	-	16	16	22	22	26
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	26
<b>KRT</b>	Line Length, cct-km	-	-	46.79	135.54	160.14	160.14
	Medium Voltage	-	-	28.75	116.84	122.59	122.59
	Low Voltage	-	-	18.04	18.70	37.55	37.55
	# MV Substation	-	-	13	44	49	53
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	53
<b>SNL</b>	Line Length, cct-km	-	-	-	32.58	32.69	33.48
	Medium Voltage	-	-	-	19.07	19.07	19.87
	Low Voltage	-	-	-	13.51	13.61	13.61
	# MV Substation	-	-	-	25	28	32
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	32
<b>Total</b>	<b>Line Length, cct-km</b>	<b>3,453.25</b>	<b>4,239.12</b>	<b>5,785.08</b>	<b>6,800.22</b>	<b>9,216.25</b>	<b>10,838.31</b>
	<b>Medium Voltage</b>	<b>1,591.57</b>	<b>2,033.57</b>	<b>3,308.97</b>	<b>3,915.49</b>	<b>5,939.22</b>	<b>7,356.31</b>
	<b>Low Voltage</b>	<b>1,861.68</b>	<b>2,205.55</b>	<b>2,476.11</b>	<b>2,884.73</b>	<b>3,277.02</b>	<b>3,482</b>
	<b># MV Substation</b>	<b>2,014</b>	<b>2,405</b>	<b>3,121</b>	<b>3,627</b>	<b>3,914</b>	<b>4,694</b>
	<b>Indoor</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,284</b>
	<b>Outdoor</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,410</b>

## Rural Electrification Fund of EDC

### Establishment of Rural Electrification Fund (REF)

The Royal Government of Cambodia (RGC) issued the Royal Decree No. NS/RKT/1204/048 dated 4 December 2004 on the establishment of Rural Electrification Fund of the Kingdom of Cambodia to accelerate the development of rural electrification. Then, on 22<sup>nd</sup> August 2012, RGC issued a new Royal Decree No. NS/RKT/0812/734, amending some articles of the old Royal Decree on formation of Rural Electrification Fund, to integrate Rural Electrification with Electricité du Cambodge (EDC) so that Rural Electrification Fund can continue to perform its works independently on Cambodian funding and still also receive grant and donations from external funding to assist in development of rural electrification in Cambodia.

### Work progress of REF after integration with EDC until the end of 2014

- 1. Power to the Poor (P2P):** The purpose of this program is to facilitate the poor households in rural areas to have access to electricity for their houses from grid supply by providing interest free loan to meet (i)- costs for the connection fees of the electricity supplier, (ii)- costs for deposit to be deposited with the electricity supplier, (iii)- costs for purchase of materials and labor for the installation of wires from the connection point to its house, and (iv)- costs for purchase of materials and labor for the installation of in-house wiring. The loan will be paid through the electricity suppliers who are responsible for paying back to REF by collecting the borrowers' monthly installments within a specific period. The amount of this loan shall not exceed 480,000 Riels per household. So far, 1,813 rural families equivalent to 8,340 people have directly benefited from this program.
- 2. Solar Home Systems (SHS) Program:** The purpose of this program is to facilitate the remote rural household, which may not have access to the electricity network for a long period, to access electricity through SHS. REF will subsidize 100 USD per SHS to rural households, as assistance to reduce the cost of the SHS and purchasers shall pay monthly installment without interest, in period of four years. After the purchaser has paid the remaining cost in full, the SHS will become the property of the purchaser. So far, 4,000 rural families equivalent to 18,400 people have directly benefited from this program.
- 3. Program for Providing Assistance to Develop Electricity Infrastructure in Rural Areas:** The purpose of this program is to facilitate the private electricity supplier in rural areas having legal license to access fund for investing on expansion of electricity supply infrastructure to fully cover its authorized distribution area in order to allow all rural households to have access to electricity for use. So far, 72 licensees equivalent to the length of 1,283 km have directly benefited from this program.

## **CAMBODIA POWER DEVELOPMENT PLAN**

### **Power Sector Development Policy**

The Royal Government of Cambodia formulated an energy sector development policy in October 1994, which aims at:

- Providing an adequate supply of electricity throughout Cambodia at reasonable and affordable price,
- Ensuring reliable and secured electricity supply which facilitates investment in Cambodia and development of the national economy,
- Encouraging exploration and environmentally and socially acceptable development of energy resources needed for supply to all sectors of the Cambodian economy,
- Encouraging efficient use of energy and minimizing environmental effects resulting from energy supply and use.

### **Power Demand Forecast**

According to Power Development Plan of the Kingdom of Cambodia, prepared in 2007, electricity demand is expected to face a significant increase for the next 14 years. Electricity generation in Cambodia is projected to grow from 278.92 MW and 1,106.48 GWh in year 2006 to 2,678 MW and 14,951 GWh in year 2025. To meet the future demand, the Royal Government has developed Power Development Plan up to 2030.

The majority of this growth will occur in the southern grid which includes Phnom Penh. The Table below depicts the expected power demand and energy output for Cambodia.

**Table 14: Cambodia's Power Demand Forecasting**

<b>Base Case</b>	<b>2014</b>	<b>2020</b>	<b>2025</b>
Peak in Main Grid (MW)	805.84*	1,681	2,678
Peak in Whole Country (MW)	887	1,681	2,678
Energy in Main Grid (GWh)	4,511.79*	9,406	14,951
Energy in Whole Country (GWh)	4,954	9,406	14,951

\* Peak Demand and Energy in Main Grid are actual data in 2014

### **Generation Master Plan**

Generation Master Plan has been developed on the following criteria:

- Peak thermal generation in Phnom Penh.
- Small and medium size diesel units for base and peak load generation in the provincial towns and cities.
- Expansion of hydro development based initially on smaller size hydro power plants which are easily accessible such as Kirirom, and subsequently mid and large size hydro projects like Kamchay, Stueng Atay, Lower Stueng Russei Chrum, Battambang, Lower Srepork II, or Lower Sesan.

## Generation Development Plan 2015 - 2020

No.	Project Name	Type	Capacity (MW)	Operation Year
1	700 MW Coal Power Plant (CIIDG) in Sihanouk Ville - Phase 1	Coal	240	2015
2	Lower Sesan II Hydro Power Plant	Hydro	400	2017
3	135 MW Coal Power Plant (CIIDG) in Sihanouk Ville	Coal	120	2017
4	Stueng Chay Areng Hydro Power Plant	Hydro	108	2020
<b>Total</b>			<b>868 MW</b>	

## Transmission Master Plan

### Transmission Development Plan 2015 - 2020

No.	115 kV Transmission Line	Circuit	Length (km)	Year	Development Partner
1	Phnom Penh loop line	2	42	2015	China Exim Bank
2	GS Siem Reap - New GS East Siem Reap	1	25	2016	BOT
3	GS2 - GS Hunsen Park and Grid Substation	2	4.50	2016	BT
4	GS7(SPP) - GS Prey Veng - GS Bavet	2	155	2017	China Exim Bank
5	Laos Border to GS Preah Vihear	1	60	2017	CHMC Phase III
6	GS Kampong Thom - GS Preah Vihear & GS Kampong Seung - GS Svay Antor	1	140	2017	CHMC Phase IV
7	Kirirom III Hydro Power - GS Chamkar Loung	1	27	2018	LDP
8	GS Kampong Cham - GS Praek Prosab (Kratie)	1	100	2018	AFD
9	Underground Line from GS1 - GS EDC HQ - GS Samdech Hunsen Park - GS Olympic Stadium - GS NCC - GS3	1	14	2018	JICA Phase I
10	Midpoint of GS5 and GS1 - GS Toul Kork	2	0.10	2020	JICA Phase II
11	GS5 - GS Chroy Changvar	2	18	2020	LDP
12	GS Banteay Meanchey - GS Oddar Meanchey	1	105	2020	LDP
<b>Total Length</b>			<b>690.60 km</b>		

## Transmission Development Plan 2015 - 2020 (Con't)

No.	230 kV Transmission Line	Circuit	Length (km)	Year	Development Partner
1	GS4 - GS Steung Hav (Along the Road No.4)	2	172	2016	BOT
2	GS Battambang - GS East Siem Reap	2	100	2017	China Exim Bank
3	GS East Siem Reap - GS Kampong Thom	2	130	2017	China Exim Bank
4	GS Kampong Thom - GS Kampong Cham	2	100	2017	China Exim Bank
5	GS Kampong Cham - GS Kratie	2	110	2017	BOT
6	GS Kratie - GS Steung Treng	2	130	2017	Indian Exim Bank
7	GS Steung Treng - Lower Sesan II	2	18	2017	BOT
8	Phnom Penh loop line 2nd Phase (NPP - Chroy Changvar - EPP - NPP)	2	65	2018	China Exim Bank
9	GS Chamkar Loung - GS Botumsakor	2	47	2018	AFD
10	GS Botumsakor - Tatay Hydro Power	2	70	2018	LDP
11	GS Koh Kong - GS Koh Kong City	2	21	2018	AFD
12	GS Kratie - GS Mondulkiri	2	140	2019	China Exim Bank
13	GS Ratanakiri - GS Steung Treng	2	105	2019	China Exim Bank
14	GS Steung Treng - Laos Border	2	48	2019	LDP
15	Midpoint of GS6(NPP) and GS4 - GS5	2	10.20	2020	JICA Phase II
16	Underground Line from GS5 - GS NCC	2	9.28	2020	JICA Phase II
<b>Total Length</b>			<b>1,275.48 km</b>		

\* LDP : Looking for Development Partner

### Power Interconnection with Thailand

The Power Cooperation Agreement with Thailand was signed on 3<sup>rd</sup> February 2000. This agreement provided a framework for the power trade and technical assistant between these two countries and opened the power access to the third countries. The Power Purchase Agreement (PPA) was signed in 2002 and amended in 2007. It encouraged the joint utilization of the existing natural resources of the two countries. When the power pool is established in the future, both countries will be able to participate widely in term of receiving and supplying the power.

At present Electric Power between Cambodia and Thailand is transmitted at 22 kV and 115 kV levels. An agreement was signed with Trat Province (Thailand) to supply power to Koh Kong province (Cambodia) and Poit Pet (Cambodia) by using 22 kV line. The above areas have been connected since 2001. 115 kV transmission line from Aranya Prathet substation, Thailand connection to BTC, BTB and SRP was commissioned in 2007.

## **Power Interconnection with Vietnam**

The Power Cooperation with Vietnam was signed in 10<sup>th</sup> June 1999. The agreement aims at the cooperation in Power Sector between the two countries. The supply of power to the areas along the border by medium voltage lines and interconnection between high voltage lines is encouraged.

Since 2002, EDC has imported power from PC2 to supply to Memut and Ponhea Krek Districts of Kampong Cham Province, Bavet in Svay Rieng Province, Kampong Trach in Kampot Province, Koh Thom and Chrey Thom in Kandal Province, Snuol District in Kratie Province, Keo Seima District in Mondulhiri Province, Kompong Ro in Svay Rieng Province. The connection for import at Phnom Den Takeo Province was energized in 2009. The interconnection transmission project for importing power from Vietnam to Phnom Penh by 230 kV was energized in March 2009.

## **Power Interconnection with Lao PDR**

The Power Cooperation with Lao PDR was signed in 21<sup>th</sup> October 1999. The agreement aims at the cooperation in Power Sector between the two countries. The supply of power to the areas along the border by medium voltage (22kV) lines and interconnection between high voltage links are also encouraged. The 22 kV interconnection line from Lao to Steung Treng was charged in 2010.

Both countries had discussed and agreed on power interconnection from Southern part of Lao PDR (Ban Hat, Cham Pasak Province) to Stung Treng of Cambodia by 115 kV line.

## **Sub-regional Interconnection**

Interconnections between the isolated grids of the countries within the Mekong Basin (Cambodia, Laos, Thailand, Vietnam, Yunan-China and Myanmar) or even a further extension of this grid to include Malaysia and Singapore have been subjected to a number of studies which aim at improving the utilization of energy resources. The report of ASEAN interconnection Master plan has been adopted in 2002, presenting a clear study about the ASEAN interconnection. Meanwhile, the revision of the ASEAN Interconnection Master Plan is under study by the ASEAN study team.

The study provides mostly an assessment of the viability and priority of regional interconnections based on the pre-feasibility studies. The study has postulated an urgent need to develop ASEAN Power Grid (APG). The ASEAN Power Grid Consultative Committee (APGCC) has been established. However, among the 10 interconnection options studies, the link between Cambodia and Vietnam are ranked as fourth and classified as a potential short to medium term project for completion before 2010.

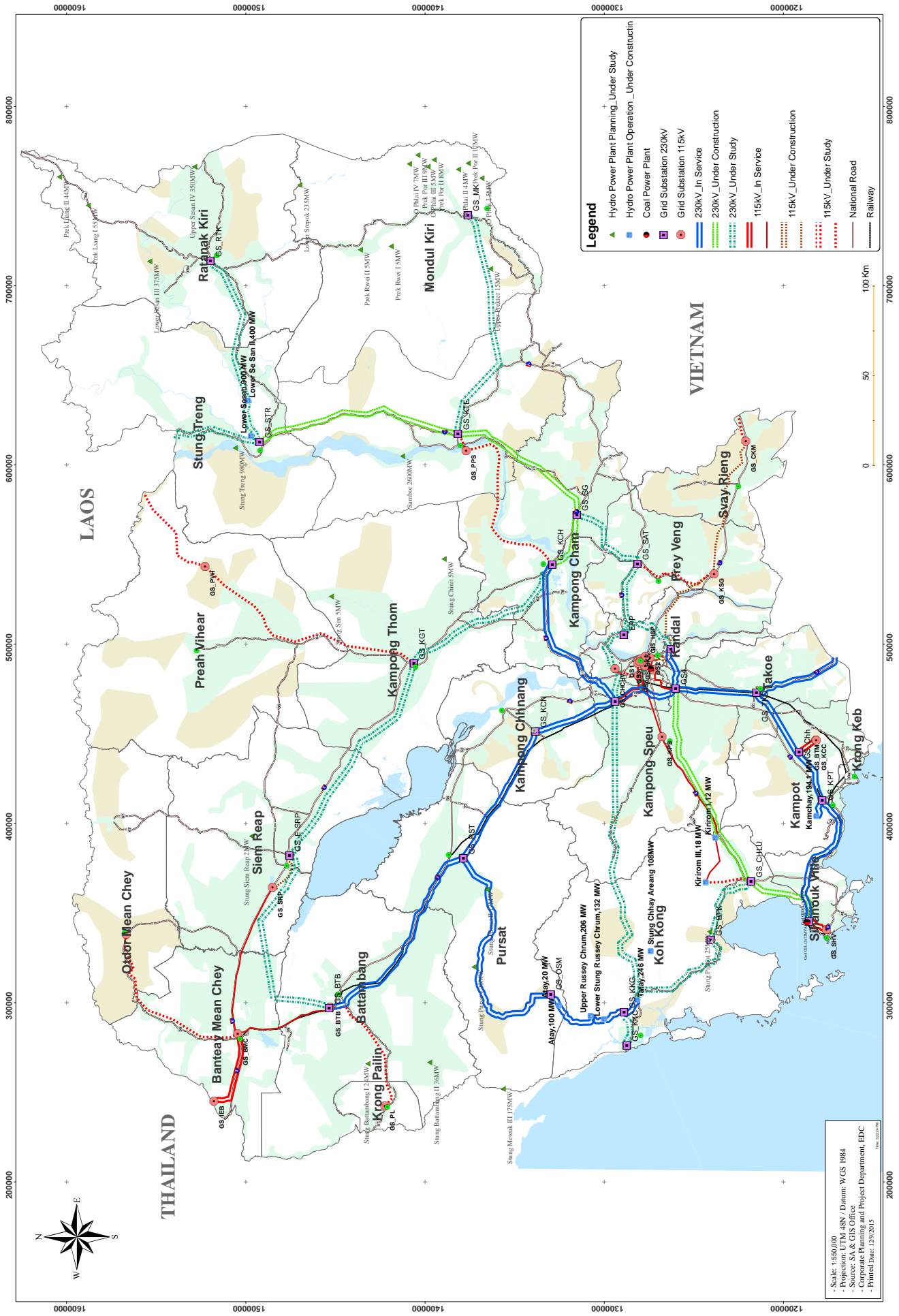


Figure 10: Transmission Line Development Plan 2015 - 2020

**ELECTRICITE DU CAMBODGE**  
**STATEMENT OF FINANCIAL POSITION**  
**AS AT 31 DECEMBER 2014**

	<b>2014</b>	<b>2013</b>
	<b>KHR'000</b>	<b>KHR'000</b>
<b>ASSETS</b>		
<b>Non-current assets</b>		
Property, plant and equipment	2,408,088,218	1,978,103,106
Intangible assets	687,120	120,400
Other non-current assets	-	192,251,528
	<b>2,408,775,320</b>	<b>2,170,475,034</b>
<b>Current assets</b>		
Cash and cash equivalents	923,608,421	770,955,966
Trade and other receivables	501,221,983	553,722,959
Inventories	202,191,621	168,164,326
	<b>1,627,022,025</b>	<b>1,492,843,251</b>
<b>Total Assets</b>	<b>4,035,797,345</b>	<b>3,663,318,285</b>
<b>EQUITY</b>		
Assigned capital	684,018,062	680,184,720
Retained earnings	1,117,011,742	815,340,771
	<b>1,801,029,804</b>	<b>1,495,525,491</b>
<b>LIABILITIES</b>		
<b>Non-current liabilities</b>		
Borrowings	1,539,666,227	1,225,470,798
Customer deposits	135,496,263	103,230,533
Provision for retirement benefit	2,676,712	2,595,564
Deferred tax liability-net	19,986,869	17,188,508
	<b>1,697,826,071</b>	<b>1,348,485,403</b>
<b>Current liabilities</b>		
Borrowings	79,926,370	144,284,304
Trade and other payables	401,678,538	619,473,366
Income tax	55,336,562	55,549,721
	<b>536,941,470</b>	<b>819,307,391</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>4,035,797,345</b>	<b>3,663,318,285</b>



**ELECTRICITE DU CAMBODGE**  
**STATEMENT OF COMPREHENSIVE INCOME**  
**For the year ended 31 December 2014**

	<b>2014</b>	<b>2013</b>
	<b>KHR'000</b>	<b>KHR'000</b>
<b>Revenue</b>		
Electricity sales	2,958,274,445	2,624,680,302
Connection service fees	39,544,709	35,025,778
Other income	15,392,163	13,809,934
	<b>3,013,211,317</b>	<b>2,673,516,014</b>
<b>Operating expenses</b>		
Purchased power	(2,243,866,492)	(1,952,554,348)
Fuel costs	(29,471,785)	(38,791,976)
Import duty	(33,963,181)	(45,632,751)
Salaries and other benefits	(125,726,983)	(101,371,233)
Other operating expenses	(77,844,015)	(65,578,646)
Depreciation	(72,081,334)	(68,947,387)
Amortisation	(157,261)	(75,593)
	<b>430,100,266</b>	<b>400,564,080</b>
<b>Operating profit</b>	<b>430,100,266</b>	<b>400,564,080</b>
Net finance costs	(49,513,604)	(13,439,986)
<b>Profit before income tax</b>	<b>380,586,662</b>	<b>387,124,094</b>
Income tax expense	(78,915,691)	(83,800,621)
<b>Net profit for the year/total</b>	<b>301,670,971</b>	<b>303,323,473</b>
<b>Comprehensive income for the year</b>	<b>301,670,971</b>	<b>303,323,473</b>

**ELECTRICITE DU CAMBODGE**  
**STATEMENT OF CASH FLOWS**  
For the year ended 31 December 2014

	<b>2014</b>	<b>2013</b>
	<b>KHR'000</b>	<b>KHR'000</b>
<b>Cash flow from operating activities</b>		
Profit for the year	301,670,971	303,323,473
Adjustments for:		
Depreciation and amortization	72,238,595	69,022,980
Loss on disposal of property, plant and equipment	6,283,814	7,974,734
Foreign expense	14,117,848	2,853,971
Interest expense	51,919,427	9,580,934
Income tax expense	78,915,691	83,800,621
Addition/(reversal) of allowance for bad and doubtful debts	927,326	(2,615,781)
Allowance for retirement benefits	81,148	634,179
Allowance for inventory obsolescence	3,234,536	2,893,249
	<u>529,389,356</u>	<u>477,468,360</u>
Changes in:		
Trade and other receivables	194,160,027	(82,330,355)
Inventories	(99,960,225)	(65,664,872)
Other non-current assets	192,251,528	2,004,225
Trade and other payables	(186,735,533)	111,995,081
Customer deposits	32,265,730	13,506,387
	<u>661,370,883</u>	<u>456,978,826</u>
Net cash generated from operations	661,370,883	456,978,826
Interest paid	(82,978,722)	(39,135,183)
Interest tax paid	(76,330,489)	(53,614,412)
<b>Net cash generated from operating activities</b>	<b>502,061,672</b>	<b>364,229,231</b>
<b>Cash flows from investing activities</b>		
Purchases of property, plant and equipment	(308,055,029)	(217,640,078)
Purchase of intangible assets	(723,963)	-
Proceeds from disposal of property, plant and equipment	296,264	251,533
<b>Net cash used in investing activities</b>	<b>(308,482,728)</b>	<b>(217,388,545)</b>
<b>Cash flow from financing activities</b>		
Proceeds from borrowings	76,222,932	124,439,313
Payments on borrowings	(117,003,409)	(79,062,222)
Government grants	(146,012)	(334)
<b>Net cash generated from financing activities</b>	<b>(40,926,489)</b>	<b>45,376,757</b>
<b>Net increase in cash and cash equivalents</b>	<b>152,652,455</b>	<b>192,217,443</b>
<b>Cash and cash equivalents at beginning of the year</b>	<b>770,955,966</b>	<b>578,738,523</b>
<b>Cash and cash equivalents at end of the year</b>	<b>923,608,421</b>	<b>770,955,966</b>