



ELECTRICITE DU CAMBODGE
| BOOK OF THE YEAR

Annual Report **2016**



Chairperson'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 2016. We are proud and appreciated achievements of EDC during 2016 and we strongly believe that EDC is moving towards

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

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

On this occasion, I wish to extend my personal heartfelt thanks to the management and staff 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



It gives me a great pride to present to you, the annual report of Electricité du Cambodge (EDC) for the year 2016 as this is another turning point in the power sector development in the Kingdom of Cambodia. The vision of EDC is to become the leading power utility in the Kingdom of Cambodia; we have always strived to meet our customers' load demands and focus in improving the quality and reliability of our power supply. This is also the year that we intensified our efforts to strengthen our service support for our valued customers.

Our energy sales in 2016 was 6,110 GWh, achieving an increase of 14% over the energy sales of the previous year. The total system loss was reduced to 8%. Our revenue increased by 11% over the previous year to reach 4,235 billion riels. We had a combined workforce of 4,597 staff members providing service to 897,175 customers.

The third unit of a coal-fired power plant (CIIDG) in Preah Sihanouk province, with a capacity of 135 MW, was commissioned. A 115 kV transmission line from GS SRP(Puk) to GS ESRP was put in operation to increase the supply capacity in Siem Reap and its demand is dramatically raising now.

An addition of one circuit to the existing 115 kV transmission line from GS BTB to GS BMC has been completed and put into service to increase the stability and quality of power supply from the national grid to Banteay Meanchey and Siem Reap.

Some high voltage transmission and medium voltage lines are currently under construction with the goal to extend and strengthen the power supply in Cambodia. The major projects are as follows:

A high voltage of 115 kV transmission line from Phnom Penh – Kampong Serng district, Prey Veng and Bavet city Svay Rieng are scheduled completion in early 2017 and another high voltage of 115 kV transmission line connecting Laos border to Preah Vihear will be completed by the end of 2017 and from Preah Vihear to Kampong Thom will be completed by the end of 2018, with a total length of approximately 360 km.

A high voltage 230 kV transmission line from Kampong Cham, Kratie - Stung Treng, and connecting to the Lower Sesan 2 hydropower plant with a total length of approximately 266 km is under construction. The project is expected to be fully completed by the end of 2017.

Approximately 1,200 km of medium voltage lines covering six provinces, Kratie, Stung Treng, Ratanakiri, Mondulakiri, Oddar Meanchey, and Siem Reap is now under construction under the rural electrification project phase II, funding provided by the Royal Government of Cambodia, is expected to be completed in 2017.

Projects for a transmission line surrounding Tonle Sap Lake (connecting Battambang - Siem Reap - Kampong Thom - Kampong Cham), Phnom Penh Loop Line Phase 2 (NPP - Chroy Changvar - EPP - SPP), and a transmission line connecting Kampong Thom - Preah Vihear - Lao PDR Border are under construction. China Exim Bank funds these projects.

The beginning of project study and negotiation 115kV transmission lines from GS Kampong Soeng to a new GS Svay Antor and from GS Preah Sihanouk to a new GS Ream with a total length of 62 km and a 230kV loop transmission line in Eastern Part of Cambodian National Grid part 1, which will be constructed from Stung Treng to Ratanakiri and from Kratie to Mondulhiri with a total length of 275 km.

More than 2,040 km of distribution lines and 220 km of transmission lines are under construction in 14 provinces, including Kandal, Kampong Speu, Kampong Chhnang, Pursat, Siem Reap, Oddar Meanchey, Preah Vihear, Kampong Cham, Kratie, Stung Treng, Ratanakiri, Mondulhiri, Koh Kong, and Preah Sihanouk, and sanctioned by China Exim Bank as Project Phase 2, 3, and 4.

Medium Voltage Sub-transmission line expansion project financed by the Asian Development Bank(ADB), which is being constructed in 5 provinces; Siem Reap, Kampong Cham, Kandal, Banteay Meanchey, which has a total length of 2,158 km. Also, the Rural Electrification Project, utilizing a grant funded by Australian Agency for International Development (AusAID) through the Asian Development Bank(ADB) with the contribution of Cambodian side with a total length of medium and low voltage lines about 620 km.

Transmission and distribution line expansion project in Koh Kong, Kampong Cham and Kratie, funded by the Agence Francaise De Developpement (AFD), conducted the feasibility study and bidding preparation.

Rural Electrification Extension Project Phase 5 and phase 6 have been started and conducted negotiations in order to further expand the rural electrification grid in 13 provinces, including Oddar Meanchey, Siem Reap, Battambang, Kratie, Prey Veng, Koh Kong, Pursat, Mondulhiri, Tboung Khmum, Ratanakiri, Kampong Cham, and Kampong Speu, with a total length of about 2.525 km.

By the end of 2016, a total of 212 power purchase agreements between EDC and REEs or license holders (licensees), who are the electricity distribution service providers, were signed for bulk supply of electrical energy from the National Grid resulting in discontinuation of operation of high-cost small generators.

The Royal Government of Cambodia has established a strategic plan to reduce tariffs and the cost of electricity supply in the Kingdom of Cambodia from 2015-2020

- (i) The goal is to cover all power supply areas with electricity from the national grid to reduce the general electricity tariff rates to the same density between downtown and rural areas.
- (ii) Low-income consumers in rural areas use only less amount of electricity.
- (iii) The electricity supply for water pumping at the favorable price of

electricity at night from 9:00 pm to 7:00 am. The tariff reduction plan and the electricity price gap have been implemented since March 2016.

In 2016, EDC has granted 40 million USD, and the German Government owned KfW Development Bank has granted 2.6 million USD (the total of 42.6 million USD) from which 12.6 million USD utilized for the operation of REF and a budget of 30 million USD for implementing the National Strategic Plan and the tariff reduction of electricity in the Kingdom of Cambodia to continue promoting and developing electrification throughout the country.

EDC has established a 24-hour hotline and created an official Facebook page to collect feedback and circulate important information, aiming at improving the effectiveness of the customer services and giving important news and announcements to the customers.

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

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

We are also grateful to the Ministry of Mines and Energy for their ongoing sectoral 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 and the Board of Directors of EDC for their valuable input and guidance. We also highly value the support of all our client groups. In addition, we highly appreciate the continued assistance extended to us by all development partners, particularly the Exim Bank of the People's Republic of China and all our Independent Power Producer partners.

With such a solid progress, EDC is moving forward with a renewed sense of optimism in its noble mission to develop the power sector in the Kingdom of Cambodia.



Keo Rottanak

RGC Delegate In charge of Managing EDC

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ABBREVIATION

- ADB	:	Asian Development Bank
- AFD	:	French Development Agency
- APG	:	ASEAN Power Grid
- APGCC	:	ASEAN Power Grid Consultative Committee
- ASEAN	:	Association of Southeast Asian Nations
- BIO	:	Biomass
- BOT	:	Build Operate Transfer
- BTB	:	Battambang
- BTC	:	Banteay Meanchey
- BVT	:	Bavet
- C	:	Coal
- Cct-km	:	Circuit-kilometer
- CEIB	:	China Export Import Bank (China Exim Bank)
- CEE	:	Compagnie des Eaux et Electricité
- CFKE	:	Compagnie Franco-Khmère d'Electricité
- CHMC	:	China National Heavy Machinery Corporation
- Con't	:	Continue
- EAC	:	Electricity Authority of Cambodia
- EDC	:	Electricité du Cambodge
- EDP	:	Electricité de Phnom Penh
- EPP	:	East Phnom Penh
- ESRP	:	East Siem Reap
- FO	:	Fuel Oil
- GS	:	Grid Substation
- GWh	:	Gigawatt-hours
- H	:	Hydro
- HQ	:	Headquarter
- IE	:	Industrial Estate
- IEB	:	Indian Exim Bank
- IMP	:	Import
- IPP	:	Independent Power Producer
- JICA	:	Japan International Cooperation Agency
- KfW	:	KfW Development Bank
- KGT	:	Kampong Trach
- KPC	:	Kampong Cham
- KPS	:	Kampong Speu
- KPT	:	Kampot
- KRT	:	Kratie

- KSM	:	Keosima
- LDP	:	Looking for Development Partner
- LSRC	:	Lower Stung Russei Chrom Hydropower Plant
- LV	:	Low Voltage
- MDKR	:	Mondulkiri
- MIME	:	Ministry of Industry, Mines, and Energy
- MME	:	Ministry of Mines and Energy
- MMT	:	Memot
- MOU	:	Memorandum of Understanding
- MV	:	Medium Voltage
- MW	:	Megawatt
- NCC	:	National Control Center
- NDF	:	Nordic Development Fun, Finland
- NG	:	National Grid
- NPP	:	North Phnom Penh
- P2P	:	Power to the Poor
- PHN	:	Phnom Penh
- PKK	:	Ponhea Krek
- PPA	:	Power Purchase Agreement
- PST	:	Pursat
- PRV	:	Prey Veng
- REE	:	Rural Electricity Enterprise
- REF	:	Rural Electrification Fund
- RGC	:	Royal Government of Cambodia
- RTK	:	Ratanakiri
- RUPP	:	Royal University of Phnom Penh
- SHS	:	Solar Home Systems
- SHV	:	Preah Sihanouk Province
- SNL	:	Snuol
- SPP	:	South Phnom Penh
- SRP	:	Siem Reap
- STH	:	Stung Hav
- STR	:	Stung Treng
- SVP	:	Suvannaphum Coal-fired Power Plant
- SVR	:	Svay Rieng
- SWS	:	Switching Substation
- TKO	:	Takeo
- UNEDI	:	Union d'Electricité d'Indochine
- WPP	:	West Phnom Penh
- WB	:	World Bank

OVERVIEW

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 the 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 the appropriate response to market requirements and earn a profit and raise productivity.

EDC is required to abide by the conditions of its license issued by the Electricity Authority of Cambodia 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 for 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 reintegrated 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 the election in 1993, EDC was restructured under the Ministry of Industry, Mines, and Energy (MIME)¹ 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.

¹ In December 2013 by the Royal Decree # 1213/017 to establish the Ministry of Mines and Energy (MME)

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 2016, 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. Ky 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 an 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 2016, 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. Ing Prorseth
Executive Director
Dept of Transmission



Mr. Aun Hemrith
Executive Director
Dept of Generation



Mr. Nop Sophea
Executive Director
Dept of Business and Distribution



Mr. Ngeth Sokhan
Executive Director
Dept of Procurement

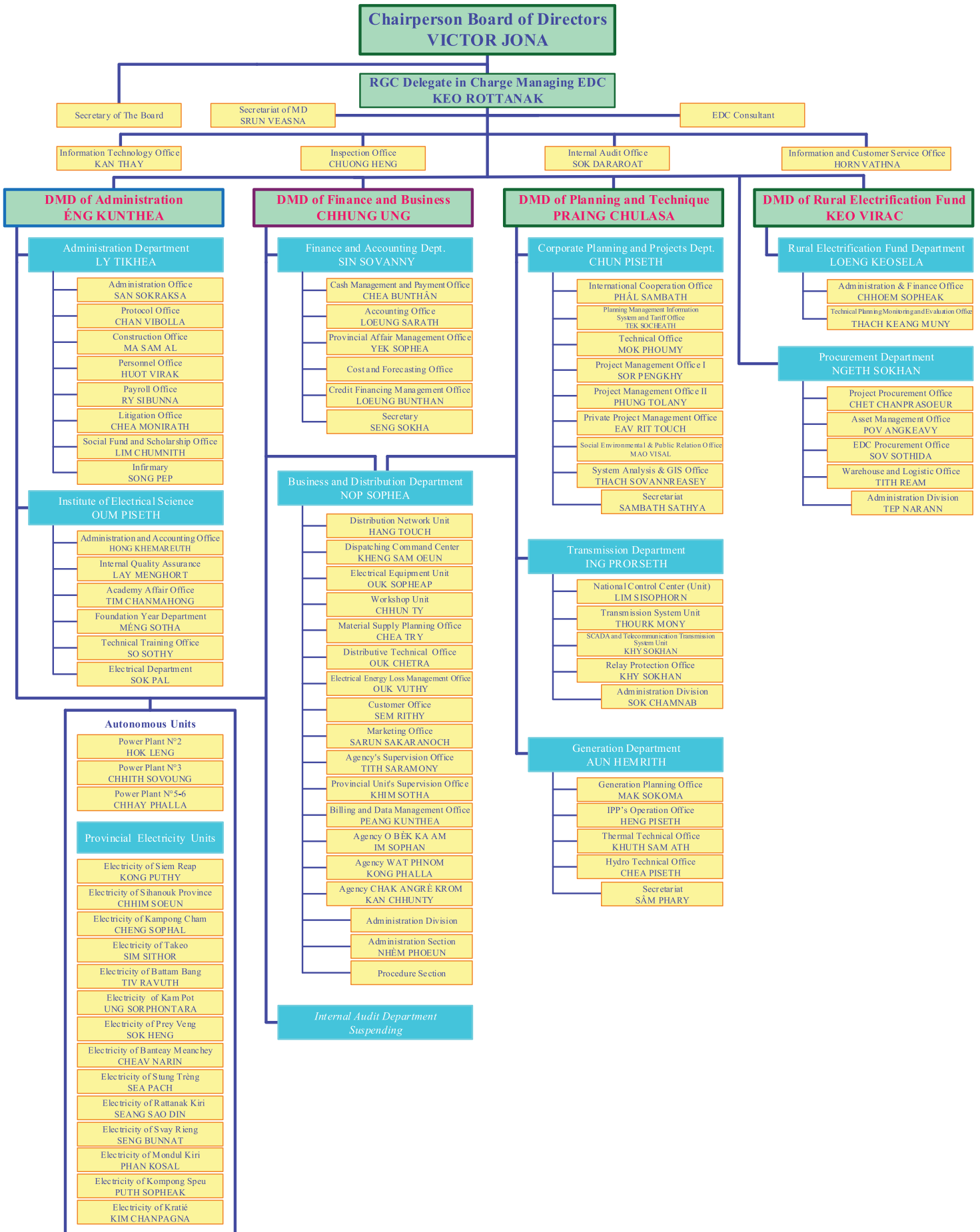


Mr. Oum Piseth
Executive Director
Institute of Electrical Science



Mr. Loeng Keosela
Executive Director
Dept of Rural Electrification Fund

Organization Chart of EDC



HUMAN RESOURCE DEVELOPMENT OF EDC

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.

LOCAL CAPACITY BUILDING

Institute of Electrical Sciences (IES) is an essential training center for EDC's employees in Phnom Penh as well as Provincial Unit under controlled by EDC. The employees may request for extra skills in addition to knowledge were educated to the existing courses proposed by IES every single year. The main purpose is to develop and absorb effectively the new knowledge to maximize their ability for improving work.

In 2016, there are 1,039 trainees in 170 batches and 85 courses who comes from the departments and provincial units, were trained in IES on the various skills such as 386 trainees on the distribution network, 47 trainees on Power Plant Protection, 204 trainees on metering, 152 trainees on safety, 51 trainees on generation, 66 trainees on the high voltage transmission line, 71 trainees on a software program and 62 trainees on technical English.

On November 23, 2016, EDC also provides its employees the short courses for English training by collaborating with the Australia Center for Education (ACE) beyond the course study from its English part-time. Until now, there are 363 employees have been studying English course. Furthermore, EDC also encourages its employees to gain the ability to use Computer Programs for increasing the working performance.

Not only scholarship for EDC's employees, EDC has signed an MOU with the Royal University of Phnom Penh (RUPP), to provide the scholarship in fostering and promoting the spirit of youth to turn to capture on subjects such as language (national literature), mathematics, and electronics. These subjects are the priority subject for the development of economy and society as well as National Identity Conservation. EDC has partnered with the RGC through the Ministry of Education, Youth and Sport to fund the students for a four-years course and to support sports and arts including the RUPP's Robot Competition.

INTERNATIONAL CAPACITY BUILDING

EDC has continued its efforts to collaborate with other national and international institutions to mobilize scholarships and short-term training in the power sector computer skills and foreign languages to increase wider knowledge and more understanding of the innovative technologies for its employees. As of 2016, EDC

has established overseas study opportunities for employees at all levels to discover additional knowledge through scholarships such as:

- “EDC’s Young Professional Scholarship” is the scholarship which EDC shoulders all expenses for studying the Master’s Degree in only ASEAN countries. “EDC’s Young Professional Scholarship” was established on September 17, 2015, in order to encourage and motivate employees who have the willingness to expand their knowledge and bring this knowledge to Cambodia. Until now, EDC has dispatched 6 employees to study Master’s Degree in various fields in Thailand and Singapore.
- Japan’s Grant Aid for Human Resource Development Scholarships (JDS) through the RGC, Cambodia is one of the twelve countries in the region that receive huge benefits from this scholarship. EDC has dispatched 18 employees to study Master’s Degree in various fields in Japan.
- EDC has signed an MOU with CHMC, a Development Partner Company to offer a Master’s Degree in China. Until now, EDC has dispatched 3 employees to study Master’s Degree in electrical engineering field.
- Ministry of Mines and Energy has signed an MOU with China Southern Power Grid Co., Ltd (CSG) to provide the scholarship to officers and EDC’s employees to pursue the Master’s Degree in China, with 6 scholarships was provided to EDC.
- Apart from these scholarships, EDC’s employees can also explore the scholarships for themselves to pursue both Master and Doctoral Degrees in foreign universities. There are 8 employees studying and graduating in Thailand and China.

Table 1: EDC Employees’ Qualification from 2011 to 2016

Type	2011	2012	2013	2014	2015	2016
Doctorate	2	3	4	4	4	5
Post-graduated	119	142	141	151	165	179
Engineering & other graduation	672	822	934	1,078	1,240	1,383
Vocational Technicians	429	493	570	736	917	1,175
Skilled Workers	207	188	180	178	173	168
High school, Unskilled	1,331	1,287	1,398	1,438	1,527	1,687
Total	2,760	2,935	3,227	3,585	4,026	4,597

POWER GENERATING FACILITIES AND ELECTRICITY SUPPLY

GENERATION SOURCES

For the year 2016, the total installed capacity is 2,107 MW, consisting of hydro (930 MW), coal (535 MW), Fuel oil (248 MW), Biomass (6 MW), and power import from neighboring countries (388 MW) including Thailand, Vietnam, and Laos. Total energy generation is 6,612 GWh in which hydro shares 39%, coal 36%, fuel oil 6%, biomass 0.5%, and import from neighboring countries 19%. As a result of domestic power source development, there has been dramatically decreasing in energy import from neighboring countries from 62% in 2010 to 19% in 2016 as well as fuel oil consumption from 34% in 2010 to 6% in 2016, and the annual generation growth is around 19% compared to 2015.

DEMAND & SUPPLY IN NATIONAL GRID

As of 2016, Cambodian National Grid is connected with Vietnam HV System, Thai HV System, Hydropower plants located in Kampong Speu, Koh Kong and Pursat, (Hydropower plants located along Kirirom mountains and Kamchay mountains), and Coal-fired power plants located in Preah Sihanouk Province. The National Grid now supply power directly to 14 city/provinces: Phnom Penh, Kandal, Kampong Speu, Takeo, Kampot, Kep, Preah Sihanouk, Kampong Chhnang, Pursat, Battambang, Banteay Meanchey, Siem Reap, Kampong Cham, and Koh Kong. The four provinces of Tbong Khmum, Prey Veng, Kampong Thom, and Pailin are supplied electricity from the National Grid through sub-transmission lines connected to the National Grid. The peak demand in the coverage area is 1,068 MW, and generated energy is 6,268 GWh. Coverage areas are as follows:

PHNOM PENH AND SUBURBAN AREAS: PHN is the capital city of Cambodia. The PHN system is supplied by National Grid via 230 kV substations such as GS4, GS6, and GS7 with the total capacity of about 900 MW which is then delivered to 115 kV system via GS1, GS2, GS3, GS4, GS5, GS6, and GS7. Generated by local fuel oil power plants, about 194 MW is additionally injected into the system. EDC Phnom Penh's coverage area includes Phnom Penh, its suburban areas, and Ta khmau, the provincial town of Kandal Province.

In 2016, for Phnom Penh System, the peak demand is 757 MW. Supplying power to 610,582 customers, EDC has absorbed 4,596 GWh of energy from National Grid while, in 2015, there was only 4,113 GWh.

SIEM REAP: SRP is the area of tourist attraction and located in the northwest of Cambodia. The power system of SRP was handed over to EDC on December 30, 1995. Electricity supply in SRP is from its own power plant and GS Puok (power import from Thailand via a 115 kV transmission line in 2007 and the system was connected to the National Grid in 2013). The main operational features of the power system in SRP for 2016 are around 90 MW of power supply originating from the National Grid and 11 MW from the local power generation. Peak Demand is 83 MW, 465 GWh of electrical energy supplied by the National Grid, 1,309 cct-km of MV and LV lines, and 48,482 customers.

PREAH SIHANOUK: SHV has the most stunning fine sandy beaches and is located in the southwestern part of Cambodia. The power system of SHV was handed over to EDC on June 11, 1996. Originally, the system was isolated and supplied by local power generation with an installed capacity of 20 MW. At the end of 2011, it was connected to KPT system that got power from the National Grid as well as imported

power from Vietnam. At the end of 2012 and early 2013, the system was supplied by the National Grid through a 230 kV transmission line from GS KPT to GS STH and a 115 kV transmission line from GS STH to GS SHV. As of 2016, 90 MW of supply comes from the National Grid and 20 MW from the local power generation. This has increased the system's capability to supply power to more areas and to other licensees in SHV. The main operational features of the power system in SHV for 2016 are 235 GWh of the annual energy generation, 46 MW is the peak demand, 889 cct-km of MV and LV network, and 17,930 customers.

KAMPONG CHAM: KGC is a province with the most fertile rubber plantations, located in the eastern part of Cambodia. The power system of KGC was handed over to EDC on March 23, 1998. The system was supplied by local power generation in 1996. Some parts of the system received imported power from Vietnam in 2011. KGC system has been connected to the National Grid since 2013. The main operational features of the power system in KGC for 2016 are: 90 MW of power supply coming from the National Grid and 8 MW from the local power generation, 85 GWh is the energy generation, 10 MW installed capacity, 32 MW peak demand, 845 cct-km of MV and LV lines, and 19,436 customers.

MEMOT AND PONHEA KREK: The power supply system for MMT and PKK is a part of Kampong Cham province. The power supply to these areas has been imported from Vietnam since 2002 with the contracted capacity of 10 MW. As of 2016, the import is 41 GWh. The system has total MV and LV lines of 403 cct-km, 11 MW of peak demand, and 15,296 customers.

BATTAMBANG: BTB is the leading and economically potential province in term of agriculture, particularly rice production. It is located in the northwestern part of Cambodia. The power system of BTB was handed over to EDC on June 28, 2000. BTB system has covered the 22 kV sub-transmission lines in Pursat Province. A 115 kV transmission line for importing power from Thailand was connected with SRP and BTC systems in 2007. Then, it was linked to the National Grid in 2012. The system has been supplied by the National Grid via GS BTB(CPG) and GS BTB(CPTL) with the total capacity of 185 MW and 2 MW of local power generation. As of 2016, the system has 2,276 cct-km of the total MV and LV lines, 292 GWh of energy generation, 65 MW of peak demand, and 47,899 customers.

BANTEAY MEANCHEY AND MONGKUL BOREI: BTC is located in the northwestern part of Cambodia. The power system of BTC was handed over to EDC on August 14, 2003. BTC was supplied by its own power plant and imported power from Thailand in 2007. Then the system was connected to the National Grid in 2013. As of 2016, 68 MW of the supply capacity is from National Grid (GS BTC and GS IE), and 3 MW more is generated by the local fuel oil power plant. There are 116 GWh of the energy generation, 24 MW of peak demand, 318 cct-km of MV and LV network and 22,348 customers.

STUNG TRENG: STR is a remote and sparsely populated province located in the northeast of Cambodia. The power system of STR was handed over to EDC on August 14, 2003. The power system of STR town has been connected to Laos system at 22 kV since 2010. As of 2016, the system has 6 MW of installed capacity (2 MW generated by its own power plant and 4 MW imported from Laos), 327 cct-km of total MV and LV lines, 8 MW of peak demand, 35 GWh of the energy generation, and 7,448 customers.

RATANAKIRI: RTK is situated on the border of Vietnam's central highlands and Laos. The power system of RTK was handed over to EDC on August 14, 2003. As of 2016, the system has 4 MW of installed capacity that is the sum of fuel oil and hydro generations, 8 MW of power import from Vietnam via a 35 kV sub-transmission line, 592 cct-km of MV and LV lines, 7 MW of peak demand, 37 GWh of energy generation, and 6,503 customers.

TAKEO AND ANG TASOM: TKO is located in the plain region of the southern part of Cambodia. The power system of TKO was handed over to EDC on June 26, 2000. The 230 kV line from Vietnam to TKO substation was energized on 31st March 2009 to import power from Vietnam. As of 2016, 45 MW of the supply capacity comes from the National Grid and 2 MW from local fuel oil power generation. The system has a peak demand of 23 MW, 786 cct-km of MV and LV line. Generated energy from its own power plant, power import from Vietnam, and National Grid are 97 GWh supplied to 21,899 customers.

KAMPOT: KPT is located in the southern part of the country. The power system of KPT was handed over to EDC on August 14, 2003. The power from the local fuel oil power generation and import from Vietnam that have been transmitted via a 22 kV line through Kampong Trach are used for supplying in KPT city. The supply capacity from National Grid was about 45 MW in 2011. As of 2016, energy generation from its own power plant, National Grid, and power import from Vietnam is 87 GWh. The system has 16 MW of peak demand, 689 cct-km of MV and LV lines, and 13,128 customers.

KAMPONG TRACH: The power supply system for KGT is a part of KPT province, and it has imported electricity from Vietnam since 2002. The power system in KGT has been supplied by the National Grid since 2014. As of 2016, the contracted capacity has been 10 MW, and the system has 121 cct-km of the line length of MV and LV lines, 14 GWh of energy generation, 3 MW of peak demand, and 5,759 customers.

PREY VENG: PRV is located in the southeast of the country. The power system of PRV was handed over to EDC on August 14, 2003. The supply sources of PRV City system are comprised of EDC's own power generation with an installed capacity around 1 MW (in 2003) and imported power from Vietnam (in 2009). After energizing lines of the rural project, PRV has also got power from KGC system (in 2013), PNH system for supplying areas along National Road No.8 (in 2014), and Suvannaphum coal fired power plant (in 2015). There are 824 cct-km of MV and LV lines and 15 MW of peak demand. The available energy is 49 GWh supplied to 6,742 customers.

SVAY RIENG: SVR is located in the southeast of the country. The power system of Svay Rieng was handed over to EDC on August 14, 2003. The source of power supply consists of power import from Vietnam (in 2003), its own power generation (in 2006), and Suvannaphum coal fired power plant (in 2015). The available capacity of the system is 8 MW. Power import and generation, as of 2016, are 194 GWh while the peak demand is 30 MW. The line length of MV and LV network is 887 cct-km to connect to 19,962 of customers have been supplied.

BAVET: The power system for BVT is a part of SVR province, and the power supply source for this area is from Vietnam. As of 2016, there is a peak demand of 16 MW, 16 MW of imported power from Vietnam, and the system has 4,465 customers.

MONDULKIRI: The power system of MDKR was handed over to EDC on May 10, 2010. The installed capacity of the system is comprised of 370 kW of hydro power generation, 300 kW of diesel power generation, and 1 MW imported from Vietnam. Under EDC control, as of 2016, available energy has been 6 GWh, and peak demand is about 2 MW. The line length of MV and LV network is 300 cct-km through which 2,692 customers have been supplied.

KEOSIEMA: The power system for KSM is in MDKR province. Supply source is by power import from Vietnam with a contracted capacity of 0.4 MW. The import has been 4 GWh and, a peak demand is 1 MW. The line length of MV and LV network is 90 cct-km through which 1,926 of customers have been supplied.

KRATIE: The power system of KRT was handed over to EDC on April 20, 2011. The system is supplied by local power generation with an installed capacity of around 1 MW (in 2011) and KGC system (in 2015). Under EDC control, as of 2016, a generation has been 29 GWh, and a peak demand is about 8 MW. The line length of MV and LV network is 380 cct-km through which 8,442 of customers have been supplied.

SNUOL: The power system is in KRT province. This system is supplied by 5 MW of imported power from Vietnam with the annual energy of 12 GWh and 3 MW of peak demand. The line length of MV and LV network is 84 cct-km through which 1,827 of customers have been supplied.

KAMPONG SPEU: On March 14, 2012, KPS branch was upgraded to a province unit as it had been under Phnom Penh System. This unit is in charge of the system in KPS town and the areas along National Road No.4, which get power supply from GS KPS. Some areas of KPS are getting power supply from GS4, GS6, and GS TKO. As of 2016, 45 MW of the supply capacity is from the National Grid. Energy generation from the National Grid has been 94 GWh, and the annual sale energy has been 94 GWh. Peak demand is 42 MW. The line length of MV and LV network is 614 cct-km through which 14,409 customers have been supplied.

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

Year			2011	2012	2013	2014	2015	2016		
Location		Capacity								
National Grid		Installed	438	751	1,364	1,913	1,896	2,031		
		Output	341	688	1,107	1,708	1,825	1,952		
PHN		Installed	429	634	1,220	1,728	1,842	1,977		
		Output	333	571	968	1,533	1,778	1,905		
EDC	IPP	FO	Installed	44	44	44	44	81	81	
			Output	41	41	41	41	75	75	
CUPL	IPP	FO	Installed	37	37	37	37	-	-	
			Output	32	32	32	32	-	-	
KEP	IPP	FO	Installed	49	49	49	49	49	49	
			Output	45	43	43	43	43	43	
CITY Power	IPP	FO	Installed	8	-	8	-	-	-	
			Output	7	-	7	-	-	-	
CEP	IPP	FO	Installed	49	49	49	49	49	49	
			Output	45	45	45	45	45	45	
COLBEN	IPP	FO	Installed	20	20	20	20	14	14	
			Output	10	10	10	10	10	10	
Kirirom I	IPP	H	Installed	12	12	12	12	12	12	
			Output	11	11	11	11	11	11	
Kirirom III	IPP	H	Installed	-	18	18	18	18	18	
			Output	-	18	18	18	18	18	
Kamchay	IPP	H	Installed	-	194	194	194	194	194	
			Output	-	194	194	194	194	194	
Atay	IPP	H	Installed	-	-	120	120	120	120	
			Output	-	-	120	120	120	120	
LSRC	IPP	H	Installed	-	-	338	338	338	338	
			Output	-	-	169	338	338	338	
Tatay	IPP	H	Installed	-	-	-	246	246	246	
			Output	-	-	-	246	246	246	
CEL	IPP	C	Installed	-	-	120	120	120	120	
			Output	-	-	100	100	100	100	
CIIDG	IPP	C	Installed	-	-	-	270	270	405	
			Output	-	-	-	125	251	377	
SVP	IPP	C	Installed	10	10	10	10	10	10	
			Output	7	7	8	8	8	8	
Thailand	IMP		PPA	-	-	-	-	120	120	
			Output	-	-	-	-	120	120	
Vietnam	IMP		PPA	200	200	200	200	200	200	
			Output	135	170	170	200	200	200	
Provinces			Installed	187	215	217	257	131	131	
			Output	179	207	210	248	121	121	
SRP	EDC	FO	Installed	11	11	11	11	11	11	
			Output	11	11	11	11	11	11	
	NG			Installed	40	40	40	80	-	-
				Output	40	40	40	80	-	-
SHV	EDC	FO	Installed	6	6	6	6	6	6	
			Output	5	5	5	5	5	5	
	IPP	FO	Installed	14	14	14	14	14	14	
			Output	10	10	10	10	10	10	

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

Year			2011	2012	2013	2014	2015	2016	
Location		Capacity							
KGC	IPP	FO	Installed	8	8	8	8	8	8
			Output	7	7	7	5	5	5
	NG		Installed	2	2	2	2	2	2
			Output	2	2	2	2	2	2
TKO	EDC	FO	Installed	2	2	2	2	2	2
			Output	2	2	2	2	2	2
	NG		Installed	4	16	16	16	-	-
			Output	4	16	16	16	-	-
BTB	EDC	FO	Installed	3	3	2	2	2	2
			Output	2	2	2	2	2	2
	NG		Installed	20	20	20	20	-	-
			Output	20	20	20	20	-	-
BTC	EDC	FO	Installed	3	3	3	3	3	3
			Output	3	3	3	3	3	3
	NG		PPA	20	20	20	20	-	-
			Output	20	20	20	20	-	-
KPT	EDC	FO	Installed	3	3	3	3	3	3
			Output	3	3	3	3	3	3
KPS	IPP	BIO	Installed	-	-	-	-	6	6
			Output	-	-	-	-	6	6
Off Grid			Installed	53	69	73	73	76	76
			Output	51	67	71	71	74	74
PKK	IMP		PPA	5	5	5	5	5	5
			Output	5	5	5	5	5	5
MMT	IMP		PPA	5	5	5	5	5	5
			Output	5	5	5	5	5	5
KGT	IMP		PPA	10	10	10	10	10	10
			Output	10	10	10	10	10	10
PRV	EDC	FO	Installed	2	2	2	2	2	2
			Output	2	2	2	2	2	2
	IMP		PPA	1	1	3	3	3	3
			Output	1	1	3	3	3	3
STR	EDC	FO	Installed	2	2	2	2	2	2
			Output	2	2	2	2	2	2
	IMP		PPA	2	4	4	4	6	6
			Output	2	4	4	4	6	6
RTK	IPP	FO	Installed	1	-	-	3	3	3
			Output	1	-	-	1	1	1
	EDC	H	Installed	1	1	1	1	1	1
			Output	1	1	1	1	1	1
	IMP		PPA	7	7	8	8	8	8
			Output	7	7	8	8	8	8
SVR	EDC	FO	Installed	1	1	1	1	1	1
			Output	1	1	1	1	1	1
	IMP		PPA	8	7	8	8	8	8
			Output	8	7	8	8	8	8
BVT	IMP		PPA	5	16	16	16	16	16
			Output	5	16	16	16	16	16

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

Year			2011	2012	2013	2014	2015	2016	
Location		Capacity							
MDKR	EDC	H/FO	Installed	1	1	1	1	1	1
			Output	1	1	1	1	1	1
	IMP		PPA	-	1	1	1	1	1
			Output	-	1	1	1	1	1
KSM	IMP		PPA	0.4	0.4	0.4	0.4	0.4	0.4
			Output	0.4	0.4	0.4	0.4	0.4	0.4
KRT	EDC	FO	Installed	-	-	1	1	1	1
			Output	-	-	1	1	1	1
	IPP	FO	Installed	3	3	3	-	-	-
			Output	1	1	1	-	-	-
SNL	IMP		PPA	1	4	4	4	5	5
			Output	1	4	4	4	5	5
Total			Installed	617	849	1,437	1,985	1,972	2,107
			Output	512	778	1,178	1,779	1,899	2,026
Percentage, %				83%	92%	82%	90%	96%	96%

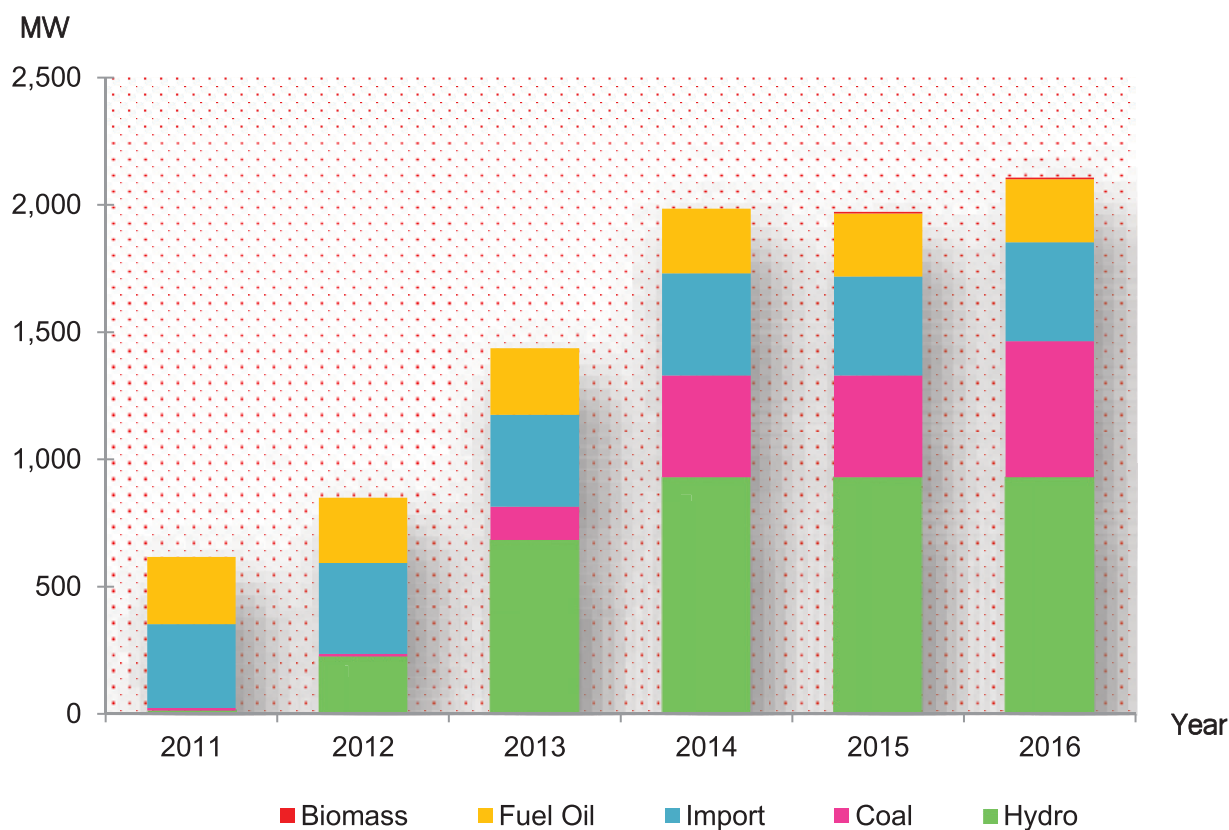


Figure 1: Installed Capacity by type from 2011 - 2016

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

Year	2011	2012	2013	2014	2015	2016
Location						
National Grid	2,389	3,082	3,423	4,228	5,399	6,268
EDC PHN	49	58	36	26	9	72
CUPL	133	132	73	35	5	-
Kirirom I	38	29	45	39	35	42
Kam Chay	-	396	463	424	363	438
Kirirom III	-	86	90	80	79	82
ATAY	-	-	267	327	106	214
LRSCR	-	-	138	866	831	923
TATAY	-	-	-	104	736	859
KEP	232	197	140	80	51	115
CITY POWER	25	16	13	-	-	-
CEP	228	209	144	96	66	160
COLBEN	34	31	19	11	4	16
S.L Garment	12	10	6	1	4	7
Suvannaphum	46	37	30	43	34	52
CEL	-	-	139	654	620	574
CIIDG	-	-	-	167	1,474	1,766
Thailand	-	76	417	350	139	147
VN	1,121	1,199	1,329	879	804	737
PP Sugar	-	1	1	10	23	23
SRP	214	268	4	5	4	8
SHV	76	90	25	9	3	11
KGC	38	57	32	8	0.2	2
TKO	13	26	0.03	0.02	0.02	0.01
BTB	68	106	0.01	0.01	0.01	0.01
KPT	33	14	12	15	12	23
BTC	28	40	0.16	0.04	0.04	0.1
Off Grid	175	229	266	284	299	344
PKK	32	40	39	30	22	23
MMT	11	14	16	16	19	22
KGT	15	17	17	13	7	14
PRV	7	12	15	13	9	5
STR	7	9	11	14	18	35
RTK	9	17	23	28	33	37
SVR	24	27	33	137	155	164
BVT	59	74	87	-	-	-
MDKR	2	3	3	4	5	6
KSM	1	1	2	3	4	4
KRT	2	7	10	15	15	20
SNL	5	7	9	10	11	12
Total	2,564	3,310	3,689	4,512	5,698	6,612

Table 4: Generation by types from Power Plants and Import during 2016, GWh

LOCATION		FUEL OIL	HYDRO	BIOMASS	COAL	IMPORT	TOTAL
National Grid		383	2,558	30	2,391	907	6,268
PHN	EDC	72	-	-	-	-	72
	IPPs	291	2,558	30	2,391	884	6,153
KPS		-	-	-	-	-	-
SRP		8	-	-	-	-	8
SHV		11	-	-	-	0.1	11
KGC		2	-	-	-	-	2
TKO		0.01	-	-	-	-	0.01
BTB		0.01	-	-	-	-	0.01
KPT		0.1	-	-	-	23	23
BTC		0.1	-	-	-	-	0.1
Off Grid		0.3	4	3	-	337	344
PKK		-	-	-	-	23	23
MMT		-	-	-	-	22	22
KGT		-	-	-	-	14	14
PRV		0.1	-	-	-	5	5
STR		0.1	-	-	-	35	35
RTK		-	2	-	-	35	37
SVR		0.02	-	-	-	164	164
MDKR		0.1	1	-	-	4	6
KSM		-	-	-	-	4	4
KRT		0.02	-	3	-	17	20
SNL		-	-	-	-	12	12
TOTAL		383	2,561	33	2,391	1,244	6,612

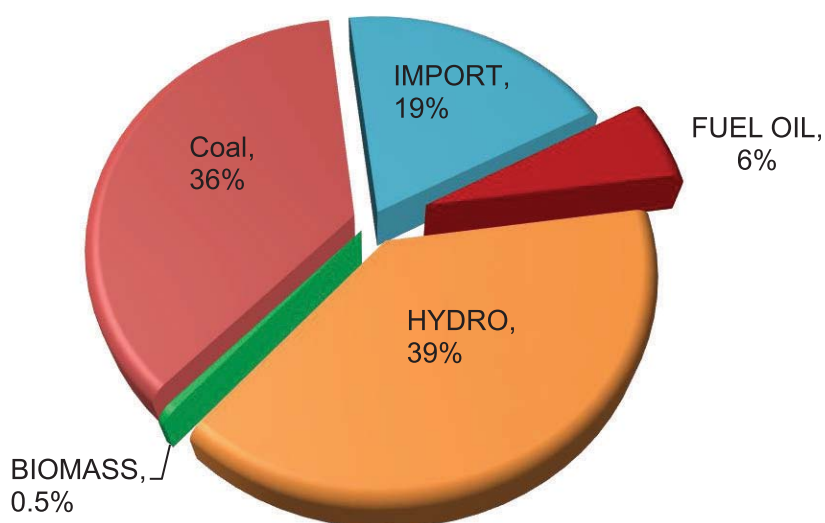


Figure 2: Generation by type in 2016

Table 5: Breakdown of Yearly Peak Demand, MW

Location	2011	2012	2013	2014	2015	2016
National Grid	407	508	625	784	951	1,068
PHN	349	410	493	563	674	757
SRP	39	47	57	59	68	83
SHV	16	19	25	30	40	46
KGC	8	10	17	14	22	32
PKK	7	7	7	6	4	4
MMT	4	4	5	4	7	7
TKO	5	7	9	18	20	23
BTB	17	21	23	26	47	65
KPT	5	5	6	13	18	16
KGT	2	3	3	3	5	3
PRV	1	3	3	8	14	15
BTC	6	9	11	19	23	24
STR	2	3	4	5	3	8
RTK	2	4	4	5	6	7
SVR	5	5	7	8	12	30
BVT	11	15	16	17	17	16
MDKR	1	1	1	1	1	2
KSM	-	0.4	0.5	1	1	1
KRT	2	1	2	3	3	8
SNL	-	1	1	2	2	3
KPS	-	-	-	-	38	42

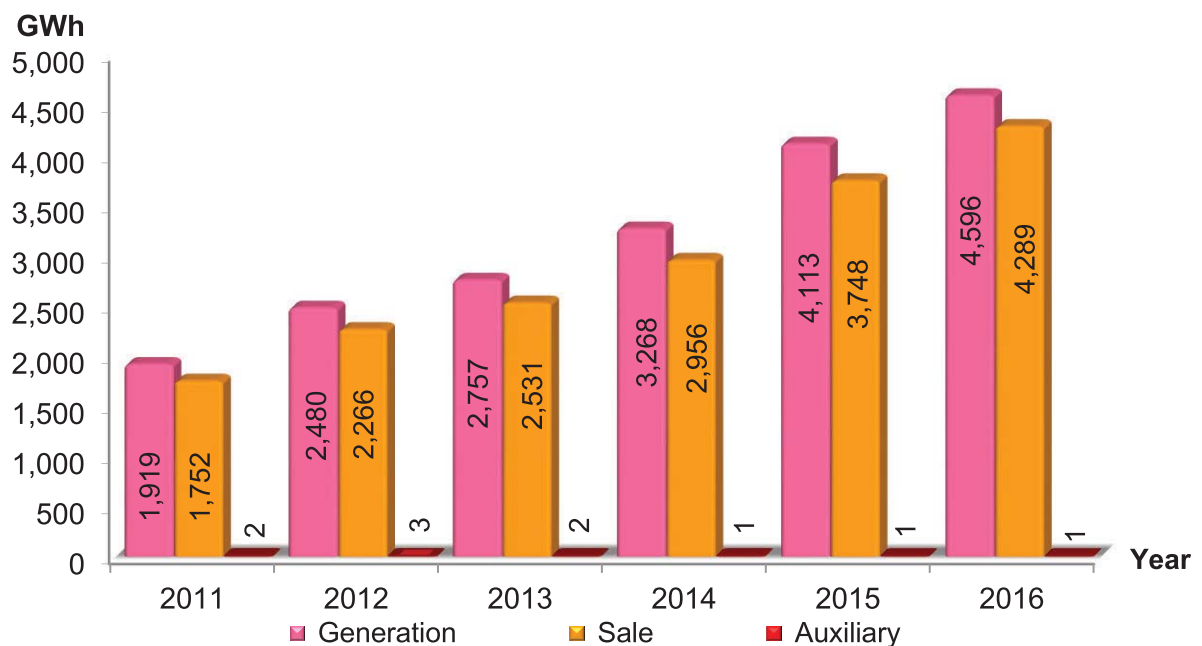


Figure 3: Breakdown of Generation, Sale and Auxiliary in Phnom Penh System

Table 6: Energy Sales, GWh

Year	2011	2012	2013	2014	2015	2016
PHN	1,752	2,266	2,531	2,956	3,748	4,289
SRP	188	237	270	319	376	447
SHV	69	80	96	141	186	232
KGC	35	52	44	43	68	75
PKK	31	38	37	29	23	23
MMT	11	13	15	15	19	23
TKO	12	24	37	54	90	94
BTB	63	99	127	161	222	278
KPT	31	49	29	44	81	97
KGT	15	17	16	13	-	-
PRV	6	11	14	20	42	45
BTC	26	36	47	71	106	110
STR	6	8	10	12	16	35
RTK	9	16	21	26	31	35
SVR	23	24	26	129	159	186
BVT	55	71	87	-	-	-
MDKR	2	3	3	4	5	6
KSM	1	1	2	3	3	4
KRT	2	6	10	15	18	28
SNL	2	6	8	11	10	9
KPS	16	42	52	84	137	94
TOTAL	2,354	3,098	3,484	4,152	5,341	6,110

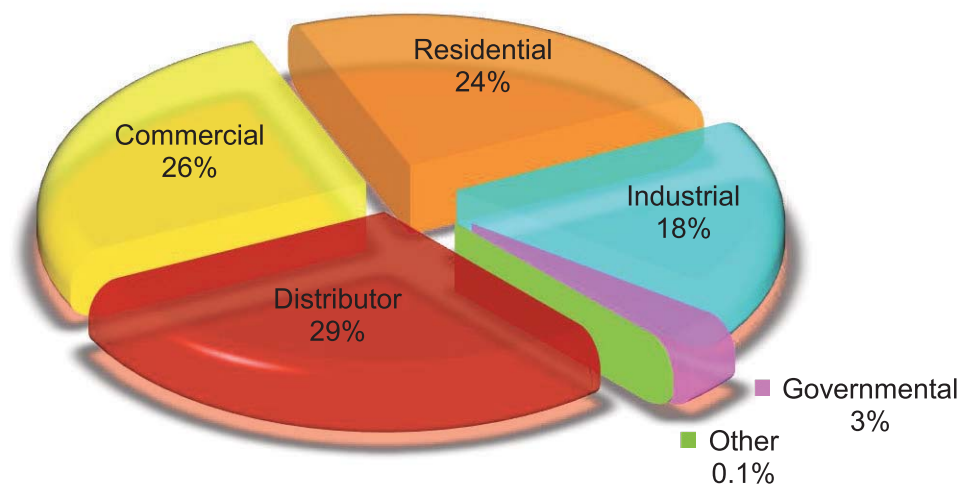


Figure 4: Energy Sale by type in 2016

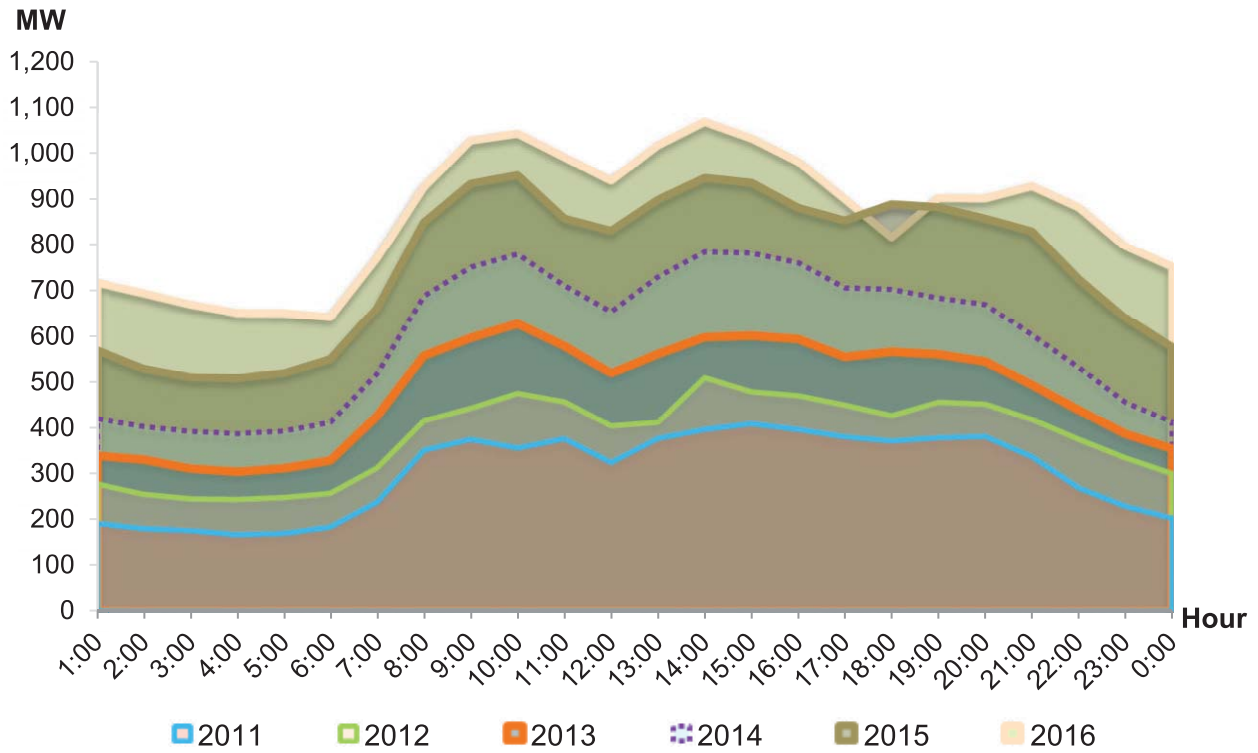


Figure 5: Daily Peak Load Curve from 2011 to 2016 in National Grid

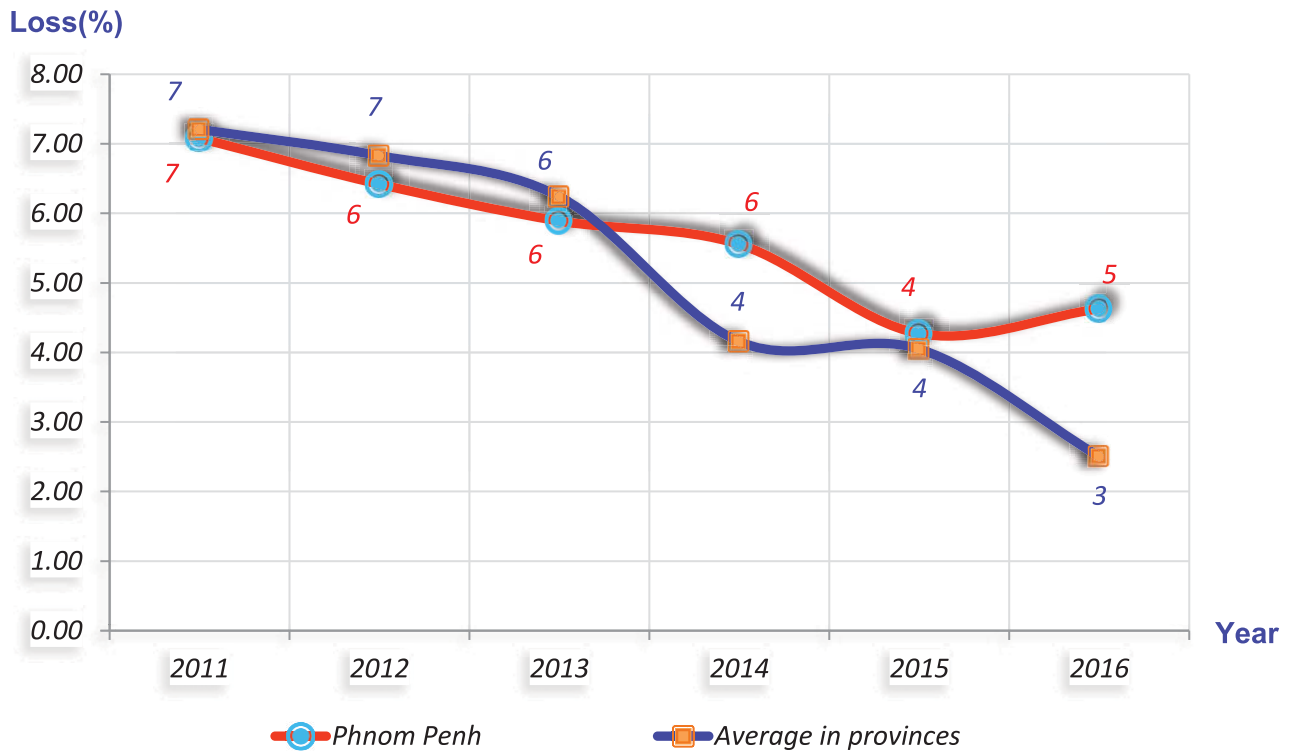


Figure 6: Distribution Losses from 2011 to 2016

Table 7: Customer from 2011 to 2016

Year	2011	2012	2013	2014	2015	2016
PHN	256,642	276,307	299,774	319,423	522,517	610,582
SRP	26,156	28,791	32,725	36,694	40,949	48,482
SHV	11,472	12,246	13,146	14,238	15,975	17,930
KGC	11,739	12,239	13,003	14,876	16,999	19,436
PKK	2,519	2,694	2,849	2,996	3,958	6,644
MMT	4,285	4,992	5,321	5,591	7,608	8,652
TKO	7,682	11,201	13,081	15,636	20,203	21,899
BTB	32,756	38,498	40,735	42,336	45,216	47,899
KPT	7,796	9,332	10,559	11,234	11,989	13,128
KGT	2,676	2,831	3,499	3,670	4,176	5,759
PRV	4,725	5,538	5,790	6,110	6,497	6,742
BTC	16,085	17,213	18,022	19,217	21,186	22,348
STR	3,090	3,563	4,668	5,782	6,280	7,448
RTK	3,197	3,538	4,233	4,722	5,235	6,503
SVR	11,390	10,298	12,474	13,892	13,968	19,962
BVT	2,562	4,518	3,174	3,802	6,742	4,465
MDKR	1,444	1,719	2,070	2,195	2,348	2,692
KSM	973	1,202	1,337	1,554	1,753	1,926
KRT	3,552	3,632	4,404	4,776	6,707	8,442
SNL	1,051	1,094	1,167	1,238	1,311	1,827
KPS	6,274	9,547	10,828	11,159	12,996	14,409
TOTAL	418,066	460,993	502,859	541,141	774,613	897,175

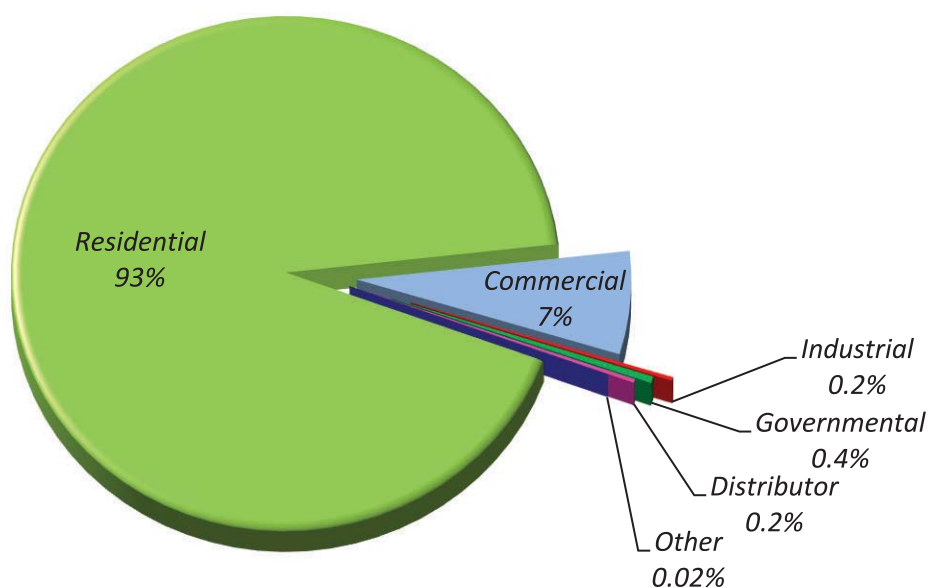


Figure 7: Customer by Type in 2016

TRANSMISSION AND DISTRIBUTION NETWORKS

Transmission Networks

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 power supply in Phnom Penh system by interlinking three grid substations. The first 115 kV transmission line of 23 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 Major source of power supply for three provinces in the north - western Cambodia - Battambang, Banteay Meanchey, and Siem Reap are imported from Thailand via 115 kV transmission line of 185 km length which 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 power to Takeo Grid Substation and the West Phnom Penh Substation (GS4) was put in service getting power 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 Hydropower plant with another 230 kV transmission line with a length of 11 km.

The 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 Ou Soam 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 of 115 kV transmission line from GS STH to GS SHV, funded by JICA loans, and 12 km of 115 kV transmission line from Chhouk to Banteay Meas Substation, funded by EDC's budget, as well as 48 km of 230 kV transmission line in Phnom Penh Loop Line project, connecting GS 6 to GS 5 and funded by loans from China Exim Bank, were put in operation.

In 2015, a 115 kV transmission line was constructed to link our GS7 with GS2 and put into operation in 2015. This is a part of the Project for Phnom Penh Loop Line funded by China Exim Bank. A new interconnection point from Champasak province, Ban Hat Substation, Lao PDR to Kampong Sralau, Preah Vihear province, Cambodia, the initial design and construction for the 115 kV transmission line was energized at 22 kV voltage level for the first stage until the transmission line from Lao border to Chey Sen Substation was completed.

In 2016, Phnom Penh - Bavet and Kampong Cham - Kratie - Stung Treng - Lower Sesan II Hydro Power Plant transmission lines with a total length of 426 km are under construction. These projects are expected to be completed by the end of 2017.

Projects for a transmission line surrounding Tonle Sap Lake (connecting Battambang - Siem Reap - Kampong Thom - Kampong Cham), Phnom Penh Loop Line Phase 2 (NPP - Chroy Changvar - EPP - SPP), and a transmission line connecting Kampong Thom - Preah Vihear - Lao PDR Border are under study. These projects are funded by China Exim Bank.

Transmission line expansion project in Koh Kong, Kampong Cham and Kratie which funded by the Agence Francaise De Developpement (AFD) has been conducted the feasibility study and bidding preparation.

The beginning of project study and negotiation 115kV transmission lines from GS Kampong Soeng to a new GS Svay Antor and from GS Preah Sihanouk to a new GS Ream with a total length of 62 km and a 230kV loop transmission line in Eastern Part of Cambodian National Grid part 1 which is going to construct from Stung Treng to Ratanakiri and from Kratie to Mondulakiri with a total length of 275 km.

Table 8: Transmission Facilities

I	115 kV Transmission line	Circuit	Cross Section (mm ²)	Line Length (km)	Operation Year	Capital Source
1	GS1 - GS3	1	2x250	12	1999	WB
2	GS3 - GS2	1	2x250	12	1999	WB
3	GS1 - GS KPS	1	150	41	2002	BOT
4	GS KPS - Kirirom I	1	150	65	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
8	GS BMC - GS BTB	1	400	53	2007	BOT
9	GS4 - GS1	1	2x250	30	2009	WB
10	GS4 - KEP	1	2x250	23	2009	WB
11	KEP - GS2	1	2x250	7	2009	WB
12	Kirirom I - Kirirom III	1	150	32	2012	BOT
13	Atay Hydropower Plant - GS Ou saom	2	630	18	2013	BOT
14	GS STH - GS Sihanouk Ville	2	400	11	2014	JICA
15	GS Chhuk - GS Banteay Meas	1	400	12	2014	EDC
16	Phnom Penh Loop Line	2	2x250	45	2015	CEIB
17	GS Siem Reap - GS East Siem Reap	1	400	25	2016	BOT
Total length				518 km		

II	230 kV Transmission line	Circuit	Section (mm ²)	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	2x630	297	2012	BOT
6	GS Pursat - GS Ou Saom	2	2x630	132	2012	BOT
7	GS KPT - GS Stung Hav(SHV)	2	630	82	2013	ADB - JICA
8	GS6(NPP) - GS KGC	2	2x400	97	2013	BOT
9	GS Ou Saom - Lower Russei Chrum Hydropower Plant	2	2x400	42	2013	BOT

Table 8: Transmission Facilities (Con't)

II	230 kV Transmission line	Circuit	Section (mm ²)	Line Length (km)	Operation Year	Capital Source
10	Phnom Penh loop line (WPP - SPP)	2	2x630	24	2014	CEIB
11	Lower Upper Russei Chrum Hydropower - Tatay Hydropower	2	2x400	38	2014	BOT
Total				893 km		

Table 9: Grid Substation Facilities

No.	Grid Substation Name	Rate Voltage (kV)	Number of Transformer	Total Capacity (MVA)	Operation Year
1	GS1	115/22	2 x 75	150	1999 Upgraded in 2013
2	GS2	115/22	3 x 50	150	1999 Added 1 unit in 2013
3	GS3	115/22	2 x 50	100	1999
		115/22/15	1 x 50	50	2013
4	GS KPS	115/22	1 x 50	50	2002
5	GS BTB (CPTL)	115/22	1 x 25	25	2007
6	GS BTC	115/22	1 x 25	25	2007
7	GS SRP	115/22	2 x 50	100	2007 Added 1 unit in 2014
8	GS4 (WPP)	230/115	2 x 200	400	2009
		115/22	2 x 50	100	
9	GS TKO	230/22	1 x 50	50	2009
10	GS KPT	230/22	1 x 50	50	2011
11	GS Kampong Chhnang	230/22	1 x 25	25	2012
12	GS Pursat	230/22	1 x 25	25	2012
13	GS BTB (CPG)	230/115/22	2 x 90	180	2012 Added 1 unit in 2015
14	GS5	115/22	2 x 50	100	2013
15	GS STH	230/22	1 x 50	50	2013
16	GS6 (NPP)	115/22	1 x 50	50	2013
		230/115	2 x 200	400	
17	GS Osom	230/115/22	1 x 150	150	2013
18	GS KGC	115/22	2 x 50	100	2013 Added 1 unit in 2015
19	GS Chhuk	230/115	1 x 100	100	2014
20	GS SHV	115/22	1 x 50	50	2014
21	GS Banteay Meas (SWS)	115	-	-	2014
22	GS7 (SPP)	230/115	1 x 200	200	2015
		115/22	1 x 50	50	
23	GS Tatay	230/35/22	1 x 60	60/60/40	2015
24	GS IE	115/22	1 x 50	50	2015
25	GS East Siem Reap	115/22	1 x 50	50	2016

Distribution Networks

The voltage of medium voltage systems of EDC generally is 22 kV and low voltage 0.4/0.23 kV. During 2009 and 2010, Distribution network in Phnom Penh, Kampong Speu, Prey Veng, Banlung (Ratanakiri), 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 the 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 including 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 in 14 provinces such as Kandal, Kampong Speu, Kampong Chhnang, Pursat, Siem Reap, Oddar Meanchey, Preah Vihear, Kampong Cham, Kratie, Stung Treng, Ratanakiri, Mondulakiri, Koh Kong, and Preah Sihanouk are under construction for which loan is sanctioned by China Exim Bank in Phase 2, 3, and 4.

Medium Voltage Sub-transmission line expansion project financed a loan by the Asian Development Bank(ADB), which is being constructed in 5 provinces: Siem Reap, Kampong Cham, Kandal, Banteay Meanchey, which has a total length of 2,158 km. Then, the Rural Electrification Project utilizing grant funded by Australian Agency for International Development (AusAID) through the Asian Development Bank(ADB) with the contribution of Cambodian side with a total length of medium and low voltage lines about 620 km.

The distribution line expansion project in Koh Kong, Kampong Cham and Kratie which funded by the Agence Francaise De Developpement (AFD) has been conducted the feasibility study and bidding preparation.

Rural Electrification Extension Project Phase 5 and phase 6 have been started and conducted negotiations in order to further expand the rural electrification grid in 13 provinces, including Oddar Meanchey, Siem Reap, Battambang Province Prey Veng Province Province Mondulakiri Khmom Ratanakiri province and province Kompong Speu, with a total length of about 2.525 km.

Table 10: Distribution Facilities of EDC System

Location	Item	2011	2012	2013	2014	2015	2016
PHN & Kandal	Line Length, cct-km	2,058	2,573	3,586	3,779	4,187	4,421
	Medium Voltage	1,076	1,287	2,204	2,325	2,641	2,759
	Low Voltage	982	1,285	1,382	1,453	1,546	1,662
	# MV Substation	1,875	2,170	2,385	2,665	2,994	3,367
	Indoor	-	-	-	1,076	1,218	1,356
	Outdoor	-	-	-	1,589	1,776	2,011
KPS	Line Length, cct-km	128	152	806	825	401	614
	Medium Voltage	74	96	673	683	242	409
	Low Voltage	54	56	132	142	160	205
	# MV Substation	62	71	87	95	102	231
	Indoor	-	-	-	-	3	3
	Outdoor	-	-	-	95	99	228

Table 10: Distribution Facilities of EDC System (Con't)

Location	Item	2011	2012	2013	2014	2015	2016
SRP	Line Length, cct-km	626	658	736	808	1,129	1,309
	Medium Voltage	350	368	414	462	749	861
	Low Voltage	276	290	322	346	380	448
	# MV Substation	158	184	196	230	308	380
	Indoor	-	-	-	132	141	147
	Outdoor	-	-	-	98	167	233
SHV	Line Length, cct-km	298	298	304	362	503	889
	Medium Voltage	204	204	208	266	401	773
	Low Voltage	94	94	96	96	103	116
	# MV Substation	155	178	187	281	312	355
	Indoor	-	-	-	51	54	62
	Outdoor	-	-	-	230	258	293
KGC	Line Length, cct-km	144	145	150	667	732	845
	Medium Voltage	51	51	52	548	607	679
	Low Voltage	93	94	98	119	125	165
	# MV Substation	59	59	64	141	201	221
	Indoor	-	-	-	6	6	6
	Outdoor	-	-	-	135	195	215
PKK	Line Length, cct-km	44	45	45	64	75	122
	Medium Voltage	27	27	27	46	50	71
	Low Voltage	17	18	18	18	25	51
	# MV Substation	31	31	21	33	43	47
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	33	43	47
MMT	Line Length, cct-km	46	46	48	216	246	281
	Medium Voltage	23	23	23	189	189	206
	Low Voltage	23	23	25	26	56	75
	# MV Substation	37	37	24	25	77	87
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	25	77	87
TKO	Line Length, cct-km	280	280	368	567	746	786
	Medium Voltage	158	158	158	316	353	356
	Low Voltage	122	122	210	251	394	431
	# MV Substation	101	104	113	167	188	188
	Indoor	-	-	-	17	25	26
	Outdoor	-	-	-	150	163	162
BTB	Line Length, cct-km	643	643	692	691	696	2,276
	Medium Voltage	401	401	444	444	447	1,977
	Low Voltage	242	242	247	247	249	299
	# MV Substation	227	228	240	240	252	696
	Indoor	-	-	-	-	1	7
	Outdoor	-	-	-	240	251	689
KPT	Line Length, cct-km	290	339	339	339	436	658
	Medium Voltage	206	227	227	227	311	534
	Low Voltage	84	112	112	112	125	125
	# MV Substation	71	90	105	105	187	229
	Indoor	-	-	-	-	-	7
	Outdoor	-	-	-	105	187	222

Table 10: Distribution Facilities of EDC System (Con't)

Location	Item	2011	2012	2013	2014	2015	2016
KGT	Line Length, cct-km	45	60	76	76	100	121
	Medium Voltage	25	39	47	47	48	56
	Low Voltage	20	21	29	29	52	65
	# MV Substation	31	36	44	44	47	53
	Indoor	-	-	-	1	1	2
	Outdoor	-	-	-	43	46	51
PRV	Line Length, cct-km	100	112	474	790	794	824
	Medium Voltage	53	56	417	731	731	760
	Low Voltage	47	57	57	59	63	65
	# MV Substation	17	20	21	194	202	247
	Indoor	-	-	-	-	4	8
	Outdoor	-	-	-	194	198	239
BTC	Line Length, cct-km	160	171	174	181	229	229
	Medium Voltage	41	46	49	51	65	65
	Low Voltage	118	125	125	130	164	164
	# MV Substation	39	50	55	60	86	56
	Indoor	-	-	-	-	8	8
	Outdoor	-	-	-	60	78	48
MKB	Line Length, cct-km	64	82	82	82	89	89
	Medium Voltage	30	45	45	45	46	46
	Low Voltage	34	37	37	37	44	44
	# MV Substation	26	35	35	39	42	22
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	39	42	22
STR	Line Length, cct-km	133	133	202	240	240	327
	Medium Voltage	92	92	132	151	151	227
	Low Voltage	41	41	70	89	89	100
	# MV Substation	25	23	37	48	53	63
	Indoor	-	-	-	-	4	9
	Outdoor	-	-	-	48	49	54
RTK	Line Length, cct-km	124	130	139	141	167	592
	Medium Voltage	90	90	92	92	103	492
	Low Voltage	34	40	47	49	63	100
	# MV Substation	30	50	72	85	103	72
	Indoor	-	-	-	1	5	4
	Outdoor	-	-	-	84	98	68
SVR	Line Length, cct-km	406	418	419	605	369	887
	Medium Voltage	314	325	325	466	154	670
	Low Voltage	92	92	94	139	215	217
	# MV Substation	56	71	54	76	114	284
	Indoor	-	-	-	-	5	5
	Outdoor	-	-	-	76	109	279
BVT	Line Length, cct-km	40	174	186	-	-	-
	Medium Voltage	12	141	141	-	-	-
	Low Voltage	28	33	44	-	-	-
	# MV Substation	50	50	21	-	-	-
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	-	-	-
MDKR	Line Length, cct-km	64	109	120	125	133	300
	Medium Voltage	32	69	73	77	85	243
	Low Voltage	32	40	47	47	48	56
	# MV Substation	42	49	54	55	76	107
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	55	76	107

Table 10: Distribution Facilities of EDC System (Con't)

Location	Item	2011	2012	2013	2014	2015	2016
KSM	Line Length, cct-km	44	64	78	89	90	90
	Medium Voltage	20	33	46	48	48	48
	Low Voltage	24	31	32	41	42	43
	# MV Substation	16	22	22	26	30	30
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	26	30	30
KRT	Line Length, cct-km	47	136	160	160	225	380
	Medium Voltage	29	117	123	123	139	279
	Low Voltage	18	19	38	38	85	101
	# MV Substation	13	44	49	53	71	101
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	53	71	101
SNL	Line Length, cct-km	-	33	33	33	37	84
	Medium Voltage	-	19	19	20	24	25
	Low Voltage	-	14	14	14	14	60
	# MV Substation	-	25	28	32	40	51
	Indoor	-	-	-	-	-	-
	Outdoor	-	-	-	32	40	51
Total	Line Length, cct-km	5,785	6,800	9,216	10,838	11,622	16,127
	Medium Voltage	3,309	3,915	5,939	7,356	7,583	11,536
	Low Voltage	2,476	2,885	3,277	3,482	4,040	4,591
	# MV Substation	3,121	3,627	3,914	4,694	5,528	6,887
	Indoor	-	-	-	1,284	1,475	1,650
	Outdoor	-	-	-	3,410	4,053	5,237

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 under MME to accelerate the development of rural electrification. Then, on 22nd August 2012, RGC issued a new Royal Decree No. NS/RKT/0812/734, amending some articles of the old Royal Decree on the formation of Rural Electrification Fund, to integrate Rural Electrification with EDC as a department so that REF can continue to perform its works independently on Cambodian funding by receiving major fund from EDC and also grant and donations from external funding to assist in the development of rural electrification in Cambodia.

Work progress of REF after integration with EDC until the end of 2016

In 2016, the fund for REF was obtained from EDC and the German Government owned KfW Development Bank. EDC provided a sum of 40 million USD for REF's operations. From which 10 million USD for implementation of the Rural Electrification Development Program, and 30 million USD for implementation of the Strategic Plan, tariff reduction, and electricity cost gap. Moreover, the German Government owned KfW Development Bank has also provided 2.6 million USD for implementation of the Rural Electrification Development Program.

1. **Power to the Poor (P2P):** The purpose of this program is to facilitate the poor households in rural areas to access to electricity for their houses from grid supply by providing interest free loan to meet (i)- costs for the connection fees, (ii)- costs for deposit, (iii)- costs for the equipment and the installation of wires from the connection point to its house, and (iv)- costs for the equipment and 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, 1,065 rural families' equivalent to 4,899 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 access to the electricity network for a long period, to access electricity through SHS. REF subsidies 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 a 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, 12,500 rural families' equivalent to 57,500 people has 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, 199 licensees equivalent to the length of 2,844 km has 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 secure 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 2015, electricity demand is expected to face a significant increase for the next 15 years. Electricity generation in Cambodia is projected to grow from 409 MW and 2,242 GWh in the year 2010 to 2,678 MW and 14,951 GWh in the 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 11: Cambodia's Power Demand Forecasting

Base Case	Unit	2016	2020	2025
Peak in National Grid	MW	1,068*	1,681	2,678
Peak in Whole Country	MW	1,103		
Energy in National Grid	GWh	6,612*	9,406	14,951
Energy in Whole Country	GWh	7,175**		

* Peak Demand and Energy in National Grid are actual data in 2016.

** Energy in the whole country is actual data in EAC Annual Report 2016.

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 hydropower plants which are easily accessible such as Kirirom I & III, and subsequently mid and large size hydro projects such as Lower Sesan II, Battambang, Lower Srepok II.

Table 12: Generation Development Plan 2017 - 2025

No.	Project Name	Type	Capacity (MW)	Operation Year
1	Lower Sesan II	Hydro	400	2018
2	Coal Fired Power Plant I	Coal	100	2019
3	Coal Fired Power Plant II	Coal	120	
4	Coal Fired Power Plant III	Coal	250	2020
5	Coal Fired Power Plant IV	Coal	250	2021
6	Chay Areng	Hydro	108	2022
7	Pursat I	Hydro	40	2023
8	Battambang II	Hydro	36	
9	Lower Sesan III	Hydro	260	
10	Lower Sre Pok III (3B)	Hydro	68	2024
11	Lower Sre Pok IV	Hydro	48	
12	Lower Sre Pok III (3A)	Hydro	300	
13	Prek Liang I	Hydro	72	2025
14	Prek Liang II	Hydro	50	
15	Prek Chhlong II	Hydro	16	
16	Lower Sesan I	Hydro	96	
17	Prek Por	Hydro	17	
18	Lower Sekong	Hydro	190	
19	Thermal I	Coal / Gas	300	
Total			2,721 MW	

Table 13: Transmission Master Plan**Transmission Development Plan 2017 - 2025**

No.	115 kV Transmission Line	Length (km)	Year	Development Partner
1	GS2 - GS Hunsen Park and Grid Substation	5	2017	BT
2	GS7(SPP) - GS Prey Veng - GS Bavet	160		CEIB
3	Laos Border to GS Preah Vihear	60		CEIB
4	GS Battambang - GS Pailin	80		EDC
5	GS3 - GS Toul Kork	5		EDC
6	GS5 - GS Chroy Changvar	18	2017	Remain from Phnom Penh Loop Line Project (CEIB)

Transmission Development Plan 2017 - 2025 (Con't)

No.	115 kV Transmission Line	Length (km)	Year	Development Partner
7	GS Kampong Cham - GS Praek Prosab (Kratie)	91	2018	AFD
8	GS Svay Antor - GS Prey Veng	46		CEIB
9	GS Preah Sihanouk - GS Ream	12		CEIB
10	GS Ream - GS Chamkar Loung	60		LDP
11	GS Chamkar Loung - Kirirom III Hydro Power	27		LDP
12	GS Kampong Thom - GS Preah Vihear	140		CEIB
13	GS Krolanh - GS Oddar Meanchey	80		LDP
14	Underground Line from GS1 - GS EDC HQ - GS Samdech Hunsen Park - GS Olympic Stadium - NCC - GS3	14		2019
15	GS Praek Prosab - GS Kratie	30	2021	LDP
Total		828 km		

No.	230 kV Transmission Line	Length (km)	Year	Development Partner
1	GS Kampong Cham - GS Kratie	125	2017	BOT
2	GS Kratie - GS Stung Treng	115	2017	IEB
3	GS Stung Treng - Lower Sesan II	26	2017	BOT
4	GS Battambang - East Siem Reap - Kampong Thom - Kampong Cham	350	2018	CEIB
5	Phnom Penh Loop Line Phase 2 (NPP - Chroy Changvar - EPP - NPP)	96	2018	CEIB
6	Tatay Hydropower - Phnom Penh	182	2018	BOT
7	GS Koh Kong - GS Koh Kong City	20	2018	AFD
8	GS Chamkar Loung - GS Botumsakor	54	2018	AFD
9	GS Botumsakor - Tatay Hydropower	70	2018	LDP
10	GS Kratie - GS Mondulkiri	170	2019	CEIB
11	GS Ratanakiri - GS Stung Treng	120	2019	CEIB
12	GS Stung Treng - Laos Border	48	2019	LDP

Transmission Development Plan 2016 - 2025 (Con't)

No.	230 kV Transmission Line	Length (km)	Year	Development Partner
13	GS Beak Chan - GS5 - NCC	20	2020	JICA Phase II
14	GS Tropang Prasat - GS Siem Reap	30	2021	BOT
Total		1,426 km		

No.	500 kV Transmission Line	Length (km)	Year	Development Partner
1	Phnom Penh – Preah Sihanouk	198	2019	BOT
2	Phnom Penh – Soung	96	2021	LDP
3	Soung – Sambo – Stung Treng	-	2025	LDP
Total		294 km		

POWER COOPERATION WITH NEIGHBORING COUNTRIES

Power Interconnection with Thailand

The Power Cooperation Agreement with Thailand was signed on 3rd February 2000. This agreement provided a framework for the power trade and technical assistance 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 terms of receiving and supplying the power.

Electric Power between Cambodia and Thailand is transmitted at 115 kV and 22 kV levels. 115 kV transmission line from Aranya Prathet substation, Thailand connection to BTC, BTB, and SRP was commissioned in 2007.

An agreement was signed with Trat Province (Thailand) to supply power to Koh Kong province (Cambodia) and Poit Pet (Cambodia) via 22 kV line. The above areas have been connected since 2001.

Power Interconnection with Vietnam

The Power Cooperation with Vietnam was signed on 10th 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.

In early 2009, EDC imported power from Vietnam via a 230kV transmission line to supply Phnom Den, Takeo Province, and Phnom Penh in March 2009.

Since 2002, EDC has imported power from PC2 (Vietnam) to supply power 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 Monduliri Province, Kompong Ro in Svay Rieng Province.

Power Interconnection with Lao PDR

The Power Cooperation with Lao PDR was signed on 21st 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 via medium voltage (22kV) lines and interconnection between high voltage links are also encouraged. The 22 kV interconnection line from Lao to Stung Treng was charged in 2010.

In 2015, A new interconnection point from Champasak province, Ban Hat Substation, Lao PDR to Kampong Sralau, Preah Vihear province, Cambodia, the initial design and construction for the 115 kV transmission line was energized at 22 kV voltage level for the first stage until the transmission line from Lao border to Chey Sen Substation was completed.

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 since 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 links between Cambodia and Vietnam are ranked as fourth and classified as a potential short to medium term project for completion before 2010.

FINANCIAL DATA

ELECTRICITE DU CAMBODGE STATEMENT OF FINANCIAL POSITION AS AT 31 DECEMBER 2016

	2016 KHR'000	2015 KHR'000
ASSETS		
Non-current assets		
Property, plant, and equipment	4,156,962,404	3,253,353,952
Intangible assets	750,939	520,508
Other non-current assets	-	-
	4,157,713,343	3,253,874,460
Current assets		
Cash and cash equivalents	1,119,567,075	1,051,948,504
Trade and other receivables	608,665,753	541,137,022
Inventories	326,323,268	232,951,873
	2,054,556,096	1,826,037,399
Total Assets	6,212,269,439	5,079,911,859
EQUITY		
Assigned capital	772,906,441	729,231,615
Retained earnings	1,927,520,208	1,470,684,535
	2,700,426,649	2,199,916,150
LIABILITIES		
Non-current liabilities		
Borrowings	2,433,713,314	1,889,207,441
Customer deposits	214,913,172	178,871,675
Provision for retirement benefit	3,349,947	3,150,191
Deferred tax liabilityies -net	32,992,267	27,572,798
	2,684,968,700	2,098,802,105
Current liabilities		
Trade and other payables Borrowings	634,027,652	627,636,366
Borrowings Trade and other payables	109,693,559	86,589,761
Income Current income tax liability	83,152,879	66,967,477
	826,874,090	781,193,604
TOTAL EQUITY AND LIABILITIES	6,212,269,439	5,079,911,859

ELECTRICITE DU CAMBODGE
STATEMENT OF COMPREHENSIVE INCOME
For the year ended 31 December 2016

	2016 KHR'000	2015 KHR'000
Revenue		
Electricity sales	4,186,986,746	3,763,629,241
Connection service fees	31,110,473	34,298,112
Other income	17,836,957	15,722,090
	4,235,934,176	3,813,649,443
Operating expenses		
Purchased power	(2,949,421,687)	(2,820,985,078)
Fuel costs	(18,332,808)	(6,927,267)
Import duty	(28,005,342)	(29,065,630)
Salaries and other benefits	(185,441,109)	(153,172,713)
Other operating expenses	(272,541,286)	(214,287,293)
Depreciation	(141,379,081)	(82,468,483)
Amortisation	(233,077)	(195,512)
	640,579,786	506,547,467
Operating profit	640,579,786	506,547,467
Net finance costs	(46,293,765)	(39,682,849)
Profit before income tax	594,286,021	466,864,618
Income tax expense	(119,012,184)	(98,108,272)
Net profit for the year/total	475,273,837	368,756,346
Comprehensive income for the year	475,273,837	368,756,346

ELECTRICITE DU CAMBODGE
STATEMENT OF CASH FLOWS
For the year ended 31 December 2016

	2016 KHR'000	2015 KHR'000
Cash flow from operating activities		
Net profit for the year	475,273,837	368,756,346
Adjustments for:		
Depreciation and amortisation	141,612,158	82,663,995
Foreign expense (gain/loss)	(28,809,082)	(31,571,899)
Loss on disposal of property, plant, and equipment	11,818,367	12,808,239
Interest expense	62,863,897	55,001,635
Income tax expense	119,012,184	98,108,272
Addition of allowance for bad and doubtful debts	3,180,852	1,535,930
Allowance for retirement benefits	199,756	473,479
Allowance for inventory obsolescence	4,342,305	4,700,449
	<u>792,494,274</u>	<u>592,476,446</u>
Changes in:		
Trade and other receivables	(85,044,550)	(8,194,377)
Inventories	(217,135,033)	(142,208,968)
Trade and other payables	3,499,097	223,357,912
Customer deposits	<u>36,041,497</u>	<u>43,375,412</u>
Net cash generated from operations	529,855,285	708,806,425
Interest paid	(59,971,709)	(52,401,719)
Interest tax paid	(97,407,313)	(78,891,428)
Net cash generated from operating activities	372,476,263	577,513,278
Cash flows from Investing activities		
Purchases of property, plant, and equipment	(229,023,615)	(395,096,151)
Purchase of intangible assets	(463,508)	(28,918)
Proceeds from disposal of property, plant, and equipment	46,255	96,664
Fixed deposit with banks	(126,630,260)	-
Capital reserve	(6,058,664)	-
Net cash used in investing activities	(362,129,792)	(395,028,405)
Cash flow from financing activities		
Proceeds from borrowings	14,724,326	30,172,387
Repayments on borrowings	(86,725,874)	(86,253,113)
Government grants	2,643,388	1,935,936
Net cash used in financing activities	(69,358,160)	(54,144,790)
Net increase in cash and cash equivalents	(59,011,689)	128,340,083
Cash and cash equivalents at beginning of the year	1,051,948,504	923,608,421
Cash and cash equivalents at end of the year	992,936,815	1,051,948,504

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