Electricity pricing in the residential sector of Cambodia

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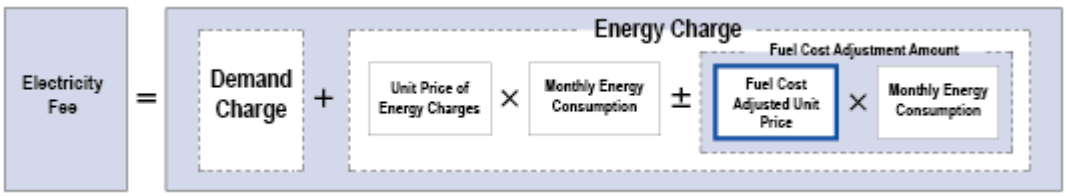
1. Components of electricity bill

The rate of electrification in Cambodia is among the lowest in Southeast Asia. The prices of electricity of some places where electricity is available are some of the highest in the world (ADB, 2012). In Cambodia, there are two types of licensees generating electricity in Cambodia. First of all, independent Power Producers (IPPs), required to have license issued by Electricity Authority Cambodia (EAC), generate and sell electricity to suppliers or industries in compliance with the Power Purchase Agreement. Secondly, consolidated licensees, which is a combination of all types of licenses granting the right to generate, transmit, dispatch, distribute, and sale electric power to consumers (EAC, 2015). Those who receive this license can fully operate like national utilities, for example, Electricite Du Cambodge (EDC).

The cost of electricity either from own generation or from purchase from IPP, neighboring country or other licensees is the single largest component of the cost of electric supply by licensees to the consumers. Hence the tariff of a licensee for supply to consumers is dependent on the cost of electricity generated or purchased. With the development of grid system, the tariff of licensees purchasing electricity from the grid has become stable. Electricity prices in Cambodia vary from places to places based on types of licensees.

According to the EAC, of the electricity generated by licensees in Cambodia, 93% use diesel and/or heavy fuel oil (HFO) as fuel for generating electricity. So, the cost of electric supply is related to the cost of Diesel/HFO. In order to quickly reflect the change in the cost of fuel in the tariff for consumers in a simple and transparent manner, EAC implements Fuel Cost Adjustment (FCA) mechanism.

Fuel Cost Adjustment (PCA) mechanism is designed to automatically adjust monthly electricity fees electricity based on varying price of fuel or coal. The electricity fee adjustment is calculated by a predetermined method on the basis of fluctuations between a 3-month average fuel price (actual recorded) and the standard fuel price (i.e., the fuel price used as the basis for electricity rates). As shown in the picture below, the PCA mechanism adjusts the monthly electricity fees by adding (when fuel prices rise) or subtracting (when fuel prices fall) a fuel cost adjustment amount (defined as a fuel cost adjusted unit price multiplied by the monthly energy consumption) (TEPCO, 2015).



Under this mechanism, the tariff for different slab rates of fuel (diesel/HFO) is determined after public consultation, so that for only a change in the cost of fuel, the corresponding tariff is fixed by EAC without the need of further public consultation (EAC 2015). Where licensee purchases electricity from other sources then the EAC has fixed the tariff for sale to consumers as the cost of purchase of electricity plus a fixed charge (EAC, 2012a).

Table below shows electricity tariffs in Cambodia in 2014. It is to note that the Electricite du Cambodge (EDC) is responsible for supplying electricity to Phnom Penh City and all provincial towns stated in the Table below.

Table 1: Electricity tariffs in Cambodia (EAC, 2015)

Type of tariff	**Location of consumer**	**Consumption slab (kWh/month)**	**Electricity Tariff (Riels/kWh)**
Progressive rate	Phnom Penh and Takhmao Town of Kandal Province	All kWh if monthly consumption does not exceed 50 kWh (0-50 kWh)	610 (~0.15 USD)
		All kWh if monthly consumption is from 51 to 200 kWh (51-200 kWh)	720 (~0.18 USD)
		All kWh if monthly consumption is more than 200 kWh	820 (~0.21 USD)
	Bamon City of Kampong Speu Province	Monthly consumption not exceeding 200 kWh (0-200 kWh)	720 (~0.18 USD)
		All kWh if monthly consumption more than 200 kWh	820 (~0.21 USD)
	Sihanoukville Province	Monthly consumption not exceeding 200 kWh (0-200 kWh)	720 (~0.18 USD)
		All kWh if monthly consumption more than 200 kWh	820 (~0.21 USD)
Fixed rate	Kompong Cham Province	All kWh	920 (~0.23 USD)
	Provincial Town of Siem Reap Province		820 (~0.21 USD)
	Provincial Town of Steung Treng Province		980 (~0.25 USD)
	Provincial Town of Ratanakiri Province		670 (~0.17 USD)
	Provincial Town of Prey Veng		1220 (~0.31 USD)
	Memot, Pohnea Krek and Bavet, Svay Rieng, Kampong Row, Svay Teap and Kampong Trach (district town)		650 (~0.16 USD)
	Kratie provincial town		1700 (~0.43 USD)
	Snoul district		600 (~0.15 USD)
	Keo Sima district		650 (~0.16 USD)
	Provincial town of Modulkiri province		1500 (~0.38 USD)

2. Example of how to calculate electricity bill

The calculation of the electricity bill in detail is not explicitly shown on the bill, but it is rather simple. For example, a household that consumes 130 kWh would have to pay 93,600 riel (130 kWh*720 riel) for the electricity, which is equal to 23.4 USD. If a household consumes 250 kWh per month, the electricity bill is then 20,500 riel (250 kWh*820 riel).

3. Electric utility in Cambodia

The electricity sector of Cambodia is administered and managed under the Electricity Law, which was launched in February 2001. The Law provides a policy framework for the development of a largely unbundled sector, with substantial private sector participation in generation and distribution on a competitive basis.

The Law has two key objectives: (i) establishing an independent regulatory body, EAC; and (ii) liberalizing generation and distribution functions to private sectors. Two functions of policymaking and regulation are clearly separated as shown in Figure 1 (EAC, 2015). There are three main institutions involving in providing energy service to electric power consumers in Cambodia, which are Ministry of Mines and Energy (MME), Electricity Authority of Cambodia (EAC), and Electric Power Service Providers (Licensees). Institutional responsibilities of main players are shown in Figure 2.

The MME is responsible for setting and administering the government policies, strategies and plans in the power sector. In the National Energy Efficiency Policy 2013 (MME, 2013), MME has formulated its will to

- Reduce the future National energy demand by 20% until 2035, compared to business as usual projections
- Reduce National CO_2 emissions in 2035 by 3 million tons of CO_2.

To achieve these above main objectives, MME has defined the goals of energy development in the Kingdom as follows:

1) From the year of 2015, the national grid has sufficient capacity to support all kinds of demands of consumers already connected to the national grid and in 2018 the national grid will provide a 25% reserve capacity for the system.
2) In 2020 the high-tension transmission line will cover all 24 cities and provinces of Cambodia. And these cities and provinces will have at least one sub-station each to receive electricity supply from the national grid.
3) In 2020, 80% of villages will be connected to the national grid and another 20% will be supplied by other energy sources such as electricity imported from neighboring countries or single supply systems. In 2030, 95% of villages of the whole country will be connected to the national grid while another 5% of the villages will be connected to single supply systems with a quality of supply similar to the national grid.
4) In 2020, at least 50% of households in Cambodia will be grid-connected with the same quality of supply as those connected to the national grid and 70% of households will follow up to 2030.

5) In 2020, the gap of electricity selling prices between urban and rural areas will be reduced and the price difference should not exceed 15%.

MME is also responsible for setting the technical standards for the power sector.

More specific responsibilities include (JICA, 2006):

- Approval of investments in the rehabilitation and development of power sector in the short, medium and long term;
- Developing policies and strategies related to restructuring, private sector participation and privatization of public utilities;
- Promotion of the use of indigenous energy resources in the generation of electricity;
- Planning related to the export and import of electricity, as well as approval of electricity export/import agreements;
- Planning/approval of subsidies to specific classes of customers and priorities regarding consumers of electricity;
- Promotion of efficiency in generation, transmission, distribution and consumption of electricity;
- Creation of a comprehensive electricity conservation program for Cambodia;
- Development of electricity sector emergency and energy security strategies; and
- Issuing and publishing standards related to technical operation, safety and environment.

Electricity Authority of Cambodia (EAC) is responsible for establishing rules, regulations, and procedures, used for monitoring, guiding, and coordinating with operators in power sector both suppliers and consumers according to policies and guidelines and technical standards issued by MME. EAC has to ensure that the provision of services and the use of electricity shall be performed efficiently, qualitatively, sustainably and in a transparent manner. EAC has the following powers and duties:

a) To issue, revise, suspend, revoke or deny the licenses for the provision of electric power services as provided in article 29 of the Law;
b) To approve tariff rates and charges and terms and conditions of electric power services of licensees, except where the Authority consider those rates or charges and terms and conditions are established pursuant to a competitive, market-based process;
c) To enforce regulations, procedures and standards for investment programs by licensees;
d) To review the financial activities and corporate organization structure of licensees to the extent that these activities and organization directly affect the operation of the power sector and the efficiency of electricity supply;
e) To approve and enforce the performance standards for licensees;
f) To evaluate and resolve consumer complaints and contract disputes involving licensees, to the extent that the complaints and disputes relate to the violation of the conditions of license;
g) To approve and enforce a uniform system of accounts for all licensees;
h) To prepare and publish reports of power sector and relevant information received from licensees for the benefit of the Government and the public;
i) To prescribe fees applicable to licensees;

j) To determine the procedures for informing the public about its activities within its duties, in order to ensure that the Electricity Authority of Cambodia complies with the principle of transparency as set forth in Article 3 of this law;
k) To issue rules and regulations and to make appropriate orders, and to issue temporary and permanent injunction for electric power services;
l) To impose monetary penalty, disconnect power supply, suspend or revoke the license for the violations of this Law, standards and regulations of the Electricity Authority of Cambodia;
m) To require the electric power service providers and the consumers to obey the rules relating to the national energy security, economic, environmental and other Government policies;
n) To perform any other function incidental or consequential to any of the duties as describes above; and
o) To establish the terms and conditions of employment of the officers or employees including experts/advisors of Electricity Authority of Cambodia.

The liberalization and deregulation of the sector has stimulated the private sector with resulting the increase of independent power producers (IPP) and rural electricity enterprises (REE) in addition to the traditional public utility, the Electricite du Cambodge (EDC). Each service provider is required to have licenses issued by EAC and to abide by the provisions of the Law and those of its license, regulations and procedures of EAC. The EAC will see if the licensees use the standards on technical operation, safety and environment issued by MME (JICA 2006).

The EDC is a leading service provider under control of MME and a 100% state-owned power company responsible for generating, transmitting and distributing electric power throughout Cambodia. EDC is a juridical organization established by the Public Enterprise Law, with administrative, financial and managerial autonomy.

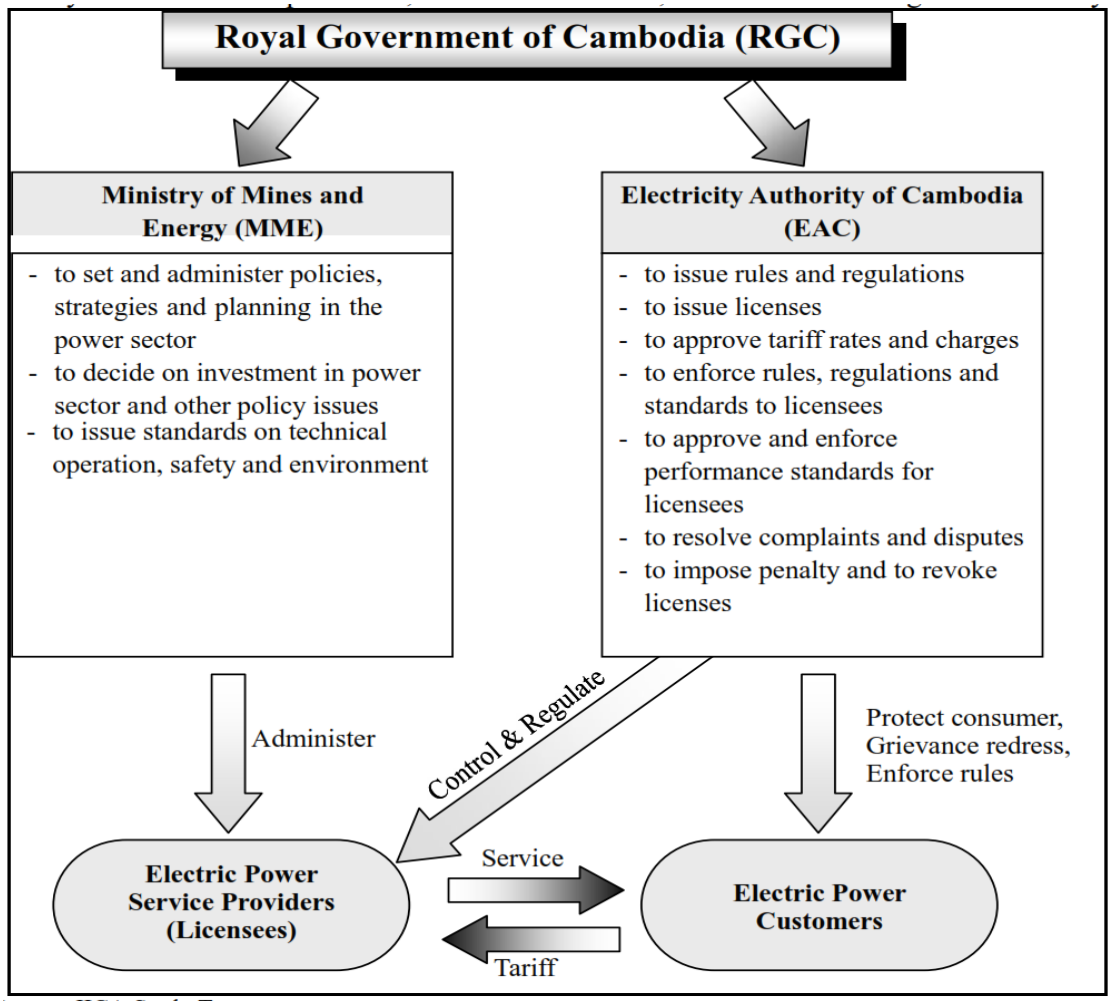


Figure 1: Institutional Responsibility of Electric Power Sector in Cambodia (JICA, 2006)

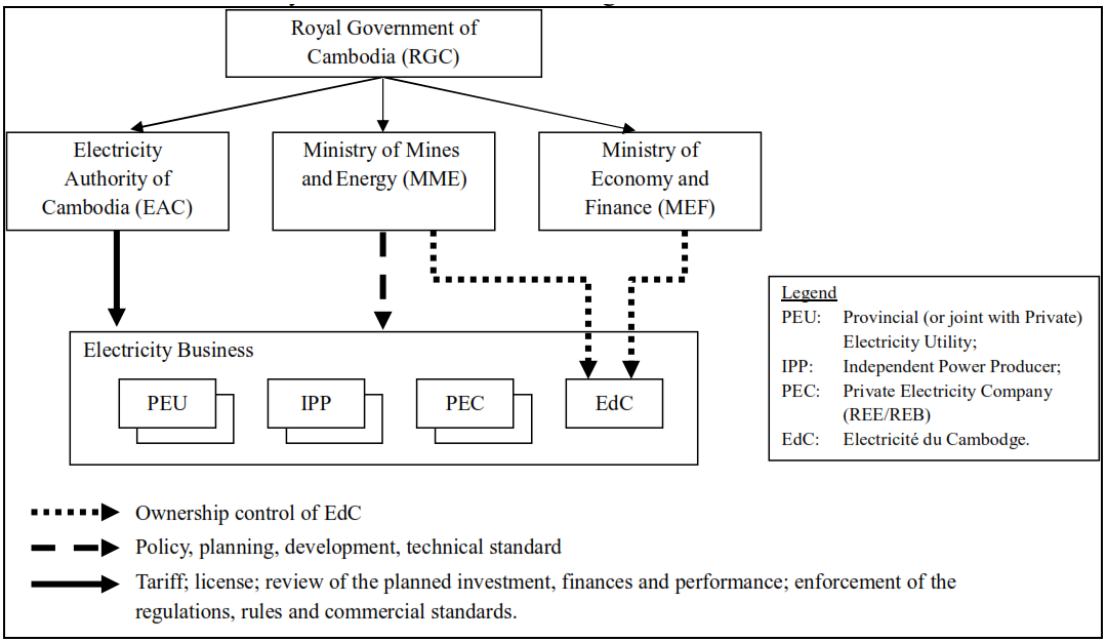


Figure 2: Structure of Cambodia's Electric Power Sector (JICA, 2006)

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