Electricity pricing in the residential sector of Lao PDR

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1. Component of electricity bill

In Lao PDR, an electricity bill for residential consumers consists of three components: base tariff, meter maintenance and the tax (10% VAT).

1.1 Base tariff

The first component is the base tariff, which reflects the costs of power-plant constructions, distribution lines, management systems, electricity imports, and other expenses from generating electricity to delivering to the end users. The base tariff is calculated under certain assumptions, such as, constant energy demand, exchange rate, and inflation rate[1]. The base tariff is defined by Electricite du Laos (EDL) and implemented by its provincial branches. EDL is a state-owned enterprise and recently established a daughter company - EDL-Generation Company (Public), referred as EDL-Gen onward.

The responsibilities of EDL and EDL-Gen are closely related. EDL-Gen is obligated to acquire sufficient electricity generation to meet the domestic demand and for export, while EDL receives electricity from EDL-Gen and distribute to the end users in all sectors throughout the country. Besides, EDL has its owns electricity generation facilities, small-scale hydropower and diesel, in off-grid areas. In addition, EDL is also responsible for power import from neighboring countries to cover domestic power deficit during the dry seasons[2] and as well as to supply consumers in strategic bordering areas, which are yet connected to the national grid.

Therefore, decisions from these organizations on energy production and distribution, for example, building a new power plant or importing electricity, will heavily affect the cost of electricity and the first component of the electricity bill. At present, there is only one type of base tariff for residential electricity consumers in Lao PDR: the progressive rate.

Progressive rate charges consumers at higher price when the more electricity is consumed. There are three levels of electricity tariff for residential sector: the consumptions between 0-25 kWh, 26-150 kWh, and above 150 kWh per month per household. Table **2** shows the electricity tariff for each level in 2015. Electricity tariffs in Lao PDR used to be heavily subsidized and did not reflect the real cost of electricity production and distribution. As a component of EDL reform, electricity price in Lao PDR was to be gradually increased for the period 2006-2017.

[1] There is no fuel adjustment counted in power generation costs in Lao PDR because almost electricity generation (99.96%) is from hydropower (EDL, 2013).
[2] During the middle dry season months (March-April), hydropower generation in Laos may be not sufficient for energy demand (considering both domestic demand and export obligation) due to low water level in hydropower plants.

In residential sector, electricity price for lowest consumption level (0-25 kWh) increased 15% per annum during 2006-2011, while it raised 11% during 2011-2013, and 2% during 2013-2017. In other words, the increase is almost threefold from 2006 to 2017. For higher level of consumption, the price increase was less. The growths in respective periods were 3%, 10% and 2% or increased by 1.5 times during 2006-2017 for consumption range between 26-150 kWh. For consumption level higher that 150 kWh, the price almost unchanged between2006 and 2011, but grew at 10% and 2% in later periods- 2011-2013 (MEM, 2014) and 2013-2017 (EDL, 2013), respectively

Table 1: Electricity prices in Lao PDR [compiled from (EDL, 2013), (MEM, 2014)]

Price in LAK	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Low voltage, Residential sector												
0 - 25 kwh	133	154	177	203	234	269	321	328	334	341	348	355
26 - 150 kwh	276	284	293	301	310	320	382	390	398	405	414	422
Above 150 kwh	773	773	773	773	773	773	923	941	960	979	999	1,019
Low voltage, not residential sector												
Irrigation	313	329	345	362	380	399	376	486	496	506	516	526
Gov. offices	703	694	684	674	665	656	783	799	815	831	848	865
Industry	634	625	616	607	599	591	706	720	734	749	764	779
Commercial	835	835	835	835	835	835	997	1,017	1,037	1,058	1,079	1,101
Int. organizations	1,077	1,077	1,077	1,077	1,077	1,077	1,286	1,312	1,338	1,365	1,392	1,420
Entertainment	1,106	1,106	1,106	1,106	1,106	1,106	1,321	1,347	1,374	1,401	1,429	1,458

Table 2: Electricity price for residential sector (June 2015)

Consumption level	**Price per unit (LAK/kWh)**	**Price per unit (USD/kWh)[3]**
< 25 kWh	341	0.042
26-150 kWh	405	0.050
>150 kWh	979	0.121

1.2 Meter Maintenance charge

In addition to base tariff, EDL charges electricity consumers meter leasing or maintenance fee on monthly basis at a constant amount per meter, and it increases every year. The meter maintenance fee in 2015 is 3,346 LAK (0.4131 USD) per month for residential consumer, while it used to be 1,160 LAK (0.1432 USD) per month in 2011; 2382 LAK (0.2941 USD) per month in 2012; and 2,667 LAK (0.3293 USD) per month in 2013. This fee has increased by 41% during 2011 to 2015, and it is likely to be risen in the future.

1.3 Value Added Tax (VAT)

VAT is a type of indirect tax collected from a person who purchases goods and services. In Lao PDR, the VAT is set at 10% by Ministry of Finance and has never been changed since.

[3] Exchange rate: 8,100 LAK/US$ (July 9, 2013, BCEL)

2. Examples of how to calculate electricity bill

For example, a household consumed 250 kWh/month and electricity bill will be calculated as followed:

Table 3: An example of Electricity bill calculation

Monthly consumption	Price	Consumption	Subtotal	
	LAK/kWh	kWh	LAK/month	USD/month
0-25 kWh per month	341	25	8,525.00	$1.05
26-150 kWh per month	405	125	50,625.00	$6.25
Above 150 kWh per month	979	50	48,950.00	$6.04
Base tariff			118,225.00	$14.60
Meter maintenance fees			3,346.00	$0.41
Tax: 10%*(basic tariff + Meter maintenance fees)			12,157.10	$1.50
Total bill			133,728.10	$16.51

According to the household surveys in Laos[4], the low-income households spend 136,000 LAK (17.53 USD) per month on average for electricity, while lowest 18,800 LAK (2.35 USD) and highest 888,000 LAK (111 USD) per month. ผิดพลาด! ไม่พบแหล่งการอ้างอิง shows electricity bill expenses breakdown for averaged bill (136,000 LAK or 17.53 USD per month). According to such electricity expenses breakdown, these electricity bills are equivalent to power consumption of 213 kWh, 67 kWh and 911 kWh per month respectively.

Table 4: Expense break down

Averaged consumption of low income households		Price per unit (LAK/kWh)	kWh	Amount
1	The first 25 kWh (0-25 kWh)	341	25	8,525
	The next 125 kWh (26-150 kWh)	405	125	50,625
	Above 150 kWh (> 150 kWh)	979	62.45	61,139
Base tariff				**123,635**
2	Meter Maintenance fees			3,346
3	VAT (10%)	10%		**12,364**
Total electricity bill (LAK)				**135,999**
Total electricity bill (USD)				**$17.00**

[4]For more detail, please see Laos's Task 3 report, "Household energy efficiency: a socio-economic perspective: Laos"

3. Electric utility in Lao PDR

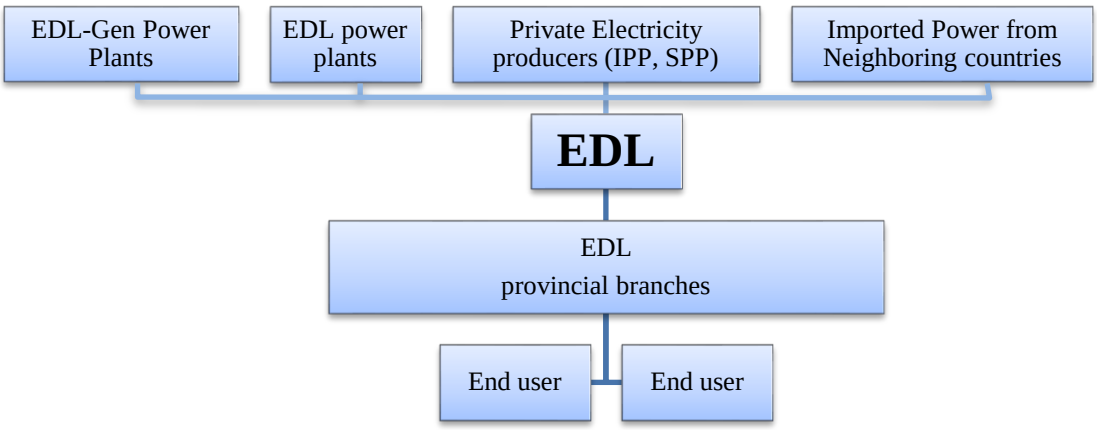

Figure 1: Electricity utility in Lao PDR

Figure 1 explains Lao PDR's electric utilities, which engages in the generation, transmission, and distribution of electricity in a regulated market. EDL is state-owned electricity supplier, which generally has three sources of electricity supply from EDL-Gen's generations, EDL's own Power plants and outsource productions from private producers; either Independent Power producer (IPP), Small Power producer (SPP) or import from neighboring countries.

The shares by supply sources for 2012 are presented in Figure **2** and seasonal changes of the shares – in Figure **3**. As seen from these figures, the share of imported power becomes more significant in dry season, because electricity generation in Laos is almost (99.96% in 2012), from hydropower resources, which usually are characterized with strong seasonal fluctuation.

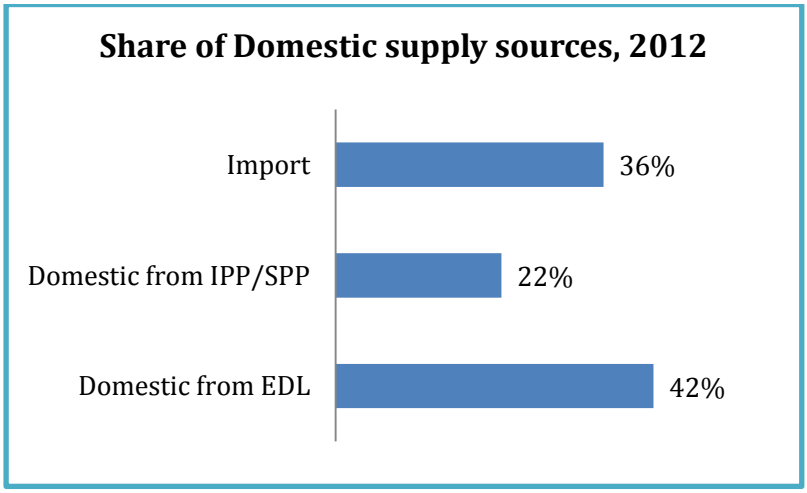

Figure 2: Share by domestic supply sources for 2012 (source: DEPP/ MEM, 2013)

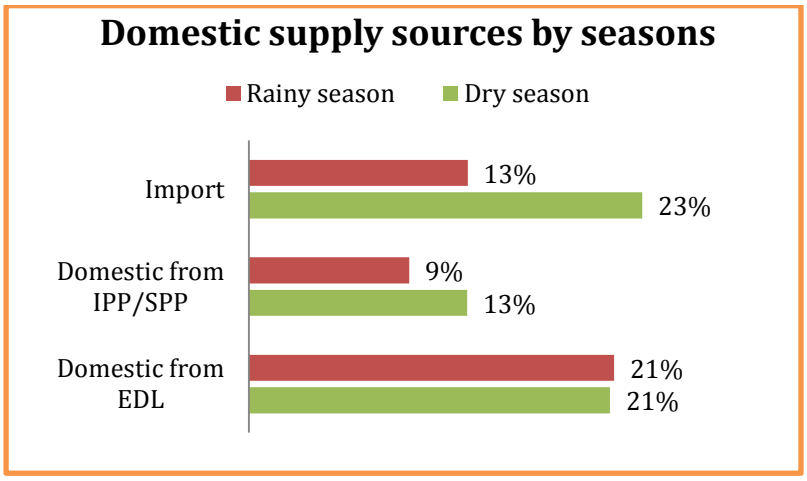

Figure 3: Seasonal change of share by supply sources (source: DEPP/MEM, 2013)

In 2013, total installed capacity of all hydropower plants in Lao PDR reached 2,980.24 MW with total energy production of 14,804.88 GWh (EDL, 2014). The shares in installed capacity and energy production of hydropower plants in Lao PDR by ownership as shown in Figure 4. EDL's own generation facilities is rather small, 3.86 MW installed capacity, or equivalent to 0.10% and 0.13% of total country's installed capacity and energy production, respectively.

On the other hand, EDL-gen owns 12.5% and 13.0% of capacity and production respectively (387 MW of capacity). IPPs own the largest generation facilities, 2,580 MW in capacity, which is equivalent to 87.1% of Lao total installed capacity and 86.6% of energy production. IPPs are usually export-oriented which means they mainly sell their generated electricity to other countries. SPP is a new form of investment by domestic private investors. The main consumers of SPPs are domestic market, but their capacities are smaller than those of IPPs.

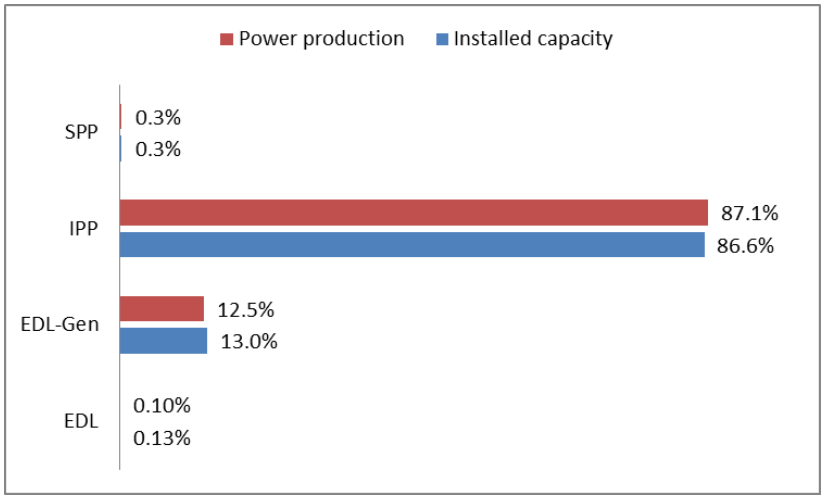

Figure 4: Installed capacity and Power generation by ownership (compiled from EDL, 2014)

The export-oriented IPPs have an obligation to supply some of their generated power to domestic market. In other words, these IPPs cannot export all their generated electricity without distributing some to the domestic consumers. This obligated

proportions vary from projects to projects. Lao government invests into hydropower development jointly with different IPPs through its two state-owned enterprises, namely EDL-Gen Company and Lao State Holding Enterprise.

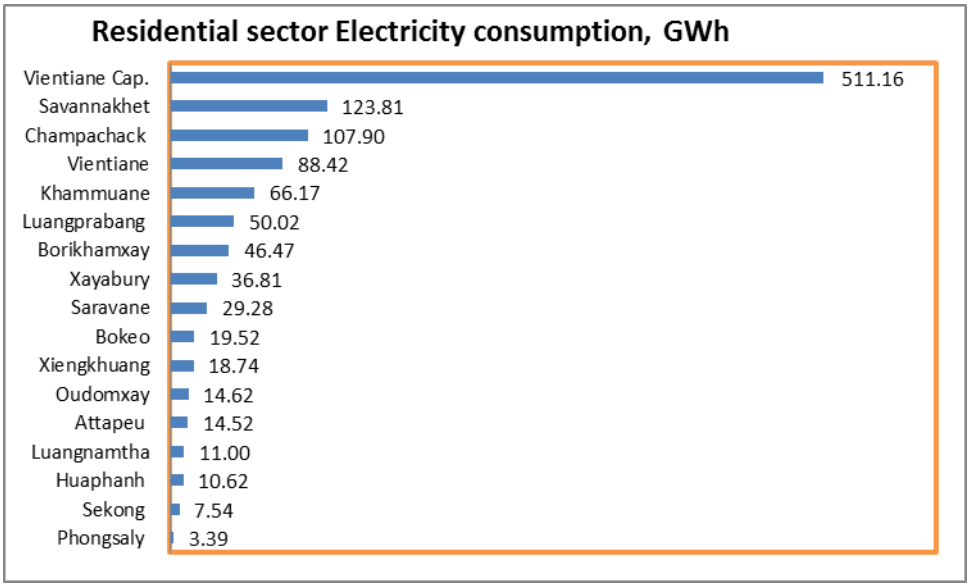

Figure 5: Residential electricity consumption by provinces (source: MEM, 2013)

As shown in Figure 5, residents of Vientiane capital are the largest electricity consumers: 511.6 GWh or 44% of total residential consumption in 2012, followed by provinces of Savannakhet, 123.8 GWh and 10.7%; Champasak, 107.9 GWh and 9.3%), Vientiane[5] (88.4 GWh and 7.6%), and Khammuane (66.2 GWh and 5.7%) (DEPP/MEM, 2013).

Vientiane capital is the most important political, social and economic hub of the country, while Savannakhet province is the largest province in terms of area and population size. Recently, because Savannakhet province has become a strategically important location, it draws several large-scale development projects, i.e. the connecting point between National North-South and Indochina East-West corridor, and the establishment of Savan-Seno Free trade zone. The province has quickly become the second largest social-economic center of the country, just after Vientiane capital, and is likely to consume much more energy in the future.

Electricity consumers in Lao PDR receive the bills from Provincial EDL Branches, which focusing on electricity distribution in urban and rural areas under the supervision of the Provincial Department of Energy and Mines. The consumers usually receive and pay the electricity bill on the post-paid basis; in other words, they pay after receiving the bills. The consumers can pay the bills at various locations, for example, EDL branches', commercial banks, automatic transaction machine (ATM), Internet or mobile banking.

[5]Vientiane province and Vientiane capital are two different administrative units

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