Rural Electrification Workshop

Presented by Institute of Renewable Energy Promotion
Ministry of Energy and Mines
Lao P.D.R

Yangon/Myanmar
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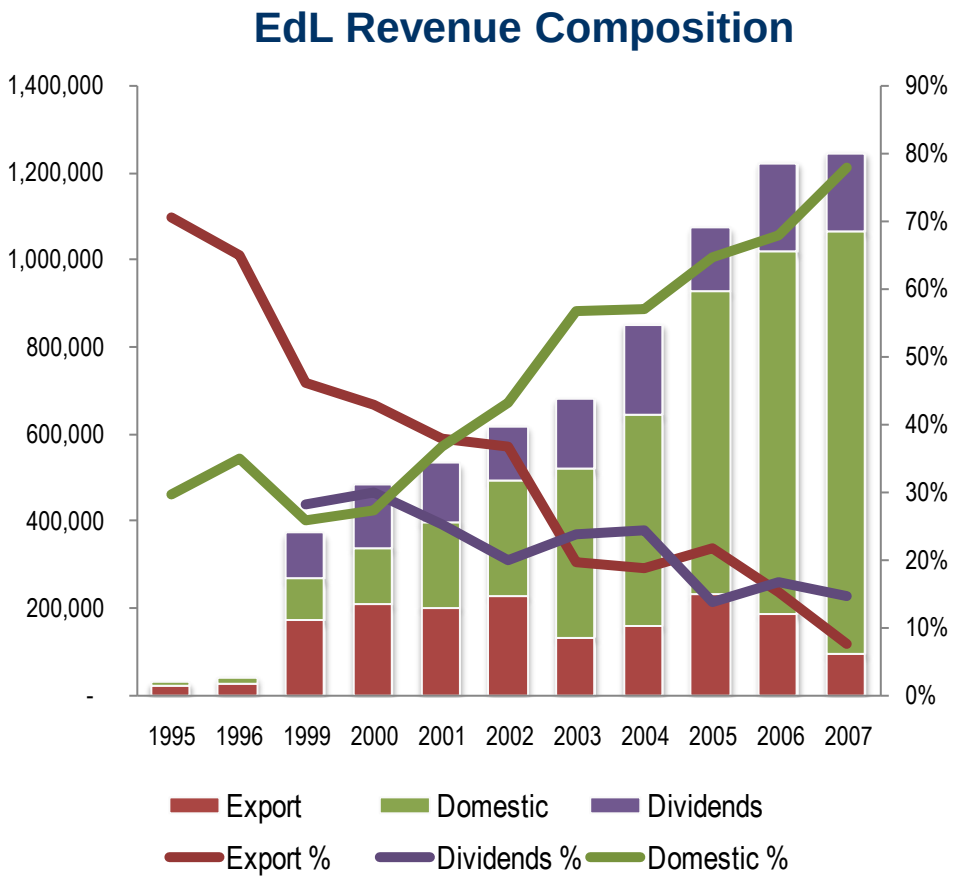
Rural Electrification
- key drivers of our success to date

1. Sustained national commitment with substantial financial support by GoL
2. Utility-driven grid-based electrification, complemented by off-grid program
3. Substantial financing platform
4. Program planning and prioritization to maximize social impact
5. Targeting the poor and being gender sensitive
6. Reducing investment and operating costs

1. Sustained national commitment with substantial financial support by GoL

- Rural electrification was set as power sector priority, with clear target (70% by 2010 and 90% by 2020)
- Revenues from hydropower exports have made an important contribution in financing the national grid rollout program
  - EDL's power export revenues
  - Hydropower IPP dividends to EDL



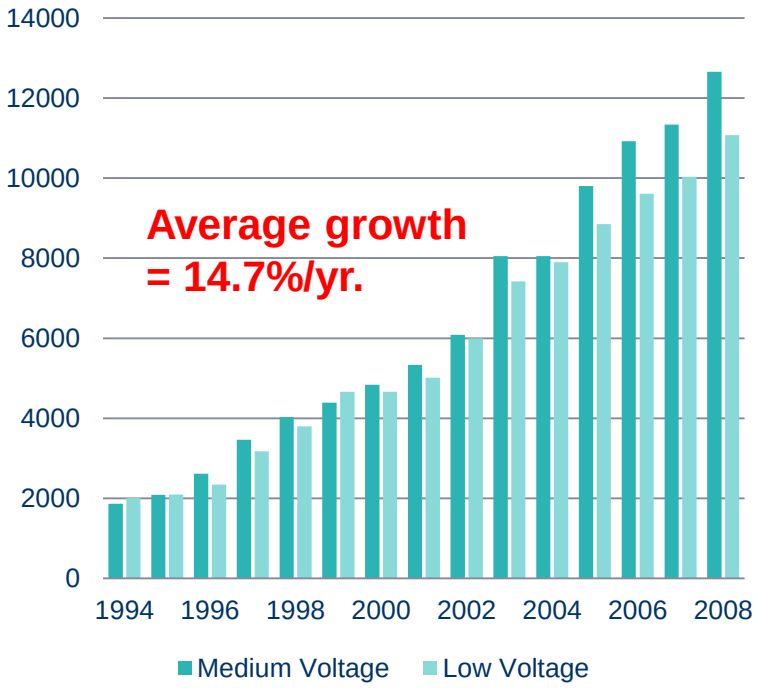
Data source: 1995-2004 from *30-Year Growth: Eletricite du Laos;* 2006-2008 from *Eletricite du Laos, Annual Reports*

Electricity Statistic up to End of 2012

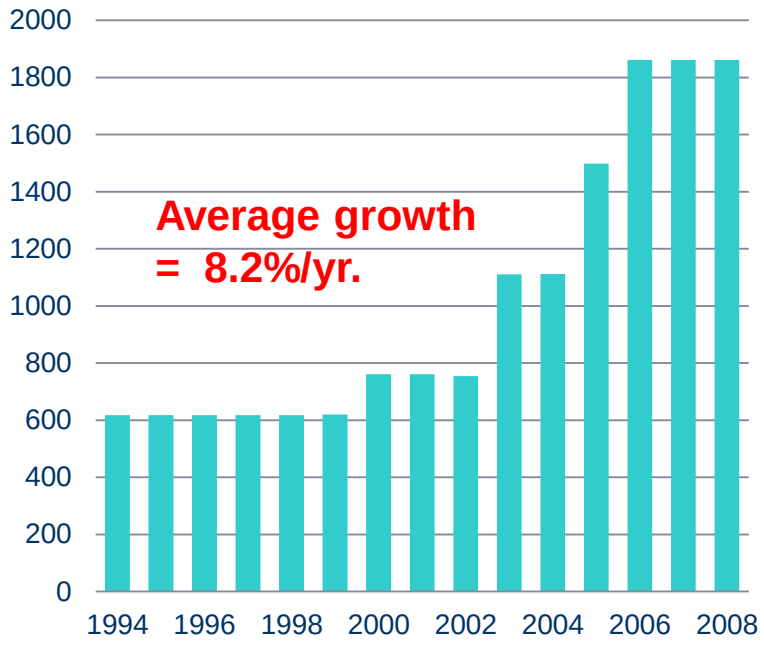
S/n	Provinces	Districts					Villages					Households				
		Total	Electrified	%	Un Electrify	%	Total	Electrified	%	Un Electrify	%	Total	Electrified	%	Un Electrify	%
1	Phongsaly	7	7	100.00%	-	0.00%	541	149	27.54%	392	72.46%	29,719	9,406	31.65%	20,313	68.35%
2	Luangnamtha	5	5	100.00%	-	0.00%	372	287	77.15%	85	22.85%	28,831	23,674	82.11%	5,157	17.89%
3	Houaphan	9	9	100.00%	1	11.11%	722	367	50.83%	355	49.17%	46,138	23,197	50.28%	22,941	49.72%
4	Bokeo	5	5	100.00%	-	0.00%	266	214	80.45%	52	19.55%	29,482	26,588	90.18%	2,894	9.82%
5	Oudomxay	7	7	100.00%	-	0.00%	470	355	75.53%	115	24.47%	48,135	30,213	62.77%	17,922	37.23%
6	Xayyabury	11	10	90.91%	-	0.00%	446	348	78.03%	98	21.97%	69,805	61,039	87.44%	8,766	12.56%
7	Luangprabang	12	12	100.00%	-	0.00%	781	680	87.07%	101	12.93%	74,905	58,115	77.58%	16,790	22.42%
8	Xiengkhouang	8	8	100.00%	-	0.00%	512	368	71.88%	144	28.13%	41,249	31,914	77.37%	9,335	22.63%
9	Vientiane	13	13	100.00%	-	0.00%	505	492	97.43%	13	2.57%	88,100	82,487	93.63%	5,613	6.37%
10	Vientiane Capital	9	9	100.00%	-	0.00%	500	500	100.00%	-	0.00%	140,059	140,059	100.00%	-	0.00%
11	Borikhamxay	7	7	100.00%	-	0.00%	323	273	84.52%	50	15.48%	43,697	40,494	92.67%	3,203	7.33%
12	Khammouan	10	10	100.00%	-	0.00%	581	483	83.13%	98	16.87%	71,407	53,689	75.19%	17,718	24.81%
13	Savannakhet	15	15	100.00%	-	0.00%	1,015	699	68.87%	316	31.13%	144,754	118,812	82.08%	25,942	17.92%
14	Champasak	10	10	100.00%	-	0.00%	641	574	89.55%	67	10.45%	109,746	101,553	92.53%	8,193	7.47%
15	Saravan	8	8	100.00%	-	0.00%	605	447	73.88%	158	26.12%	60,281	47,243	78.37%	13,038	21.63%
16	Attapue	5	5	100.00%	-	0.00%	147	103	70.07%	44	29.93%	22,913	16,609	72.49%	6,304	27.51%
17	Xekong	4	4	100.00%	-	0.00%	229	109	47.60%	120	52.40%	16,796	11,670	69.48%	5,126	30.52%
	Total	145	144	99.31%	1	0.69%	8,656	6,448	74.49%	2,208	25.51%	1,066,017	876,762	82.25%	189,255	17.75%

Underpinning grid access expansion has been a fast paced expansion of EdL's transmission and distribution network system

All Distribution Lines
(km-circuit)



115KV Transmission Lines
(km-circuit)



Note:
- Medium voltage: 22KV, 35KV, Sh. W25KV and Sh. W12.7 KV
- Low voltage: 0.4KV, Sh.W0.22KV

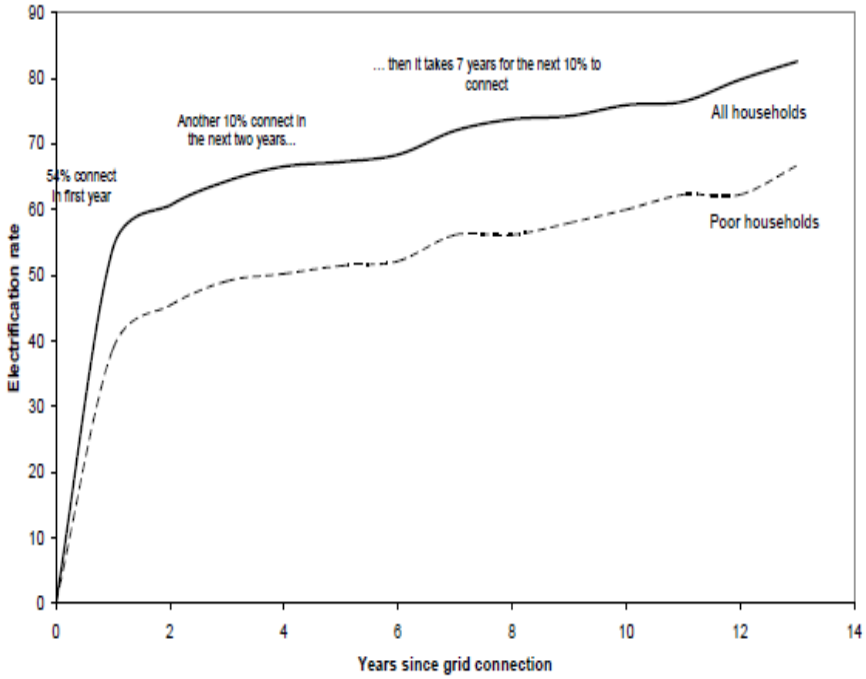
Data source:
-1994-2004 from *30-Year Growth: Eletricite du Laos*
- 2006-2008 from *Eletricite du Laos, Annual Reports*

5. Targeting the poor & being gender sensitive

Social economic survey under World bank supported rural electrification program indicates

- **20~40%** of rural households cannot afford the upfront connection charge of about $100 when the grid was first extended to their villages
- Even 10 years after the grid was extended to the villages, about **20%** of households remain unconnected
- Disproportionally large percentage of unconnected poor households are **women-headed households**

Connection Rate by Years Since Grid Reached Village



Power to the Poor (P2P) program

Addressing the equity and gender dimension of rural electrification

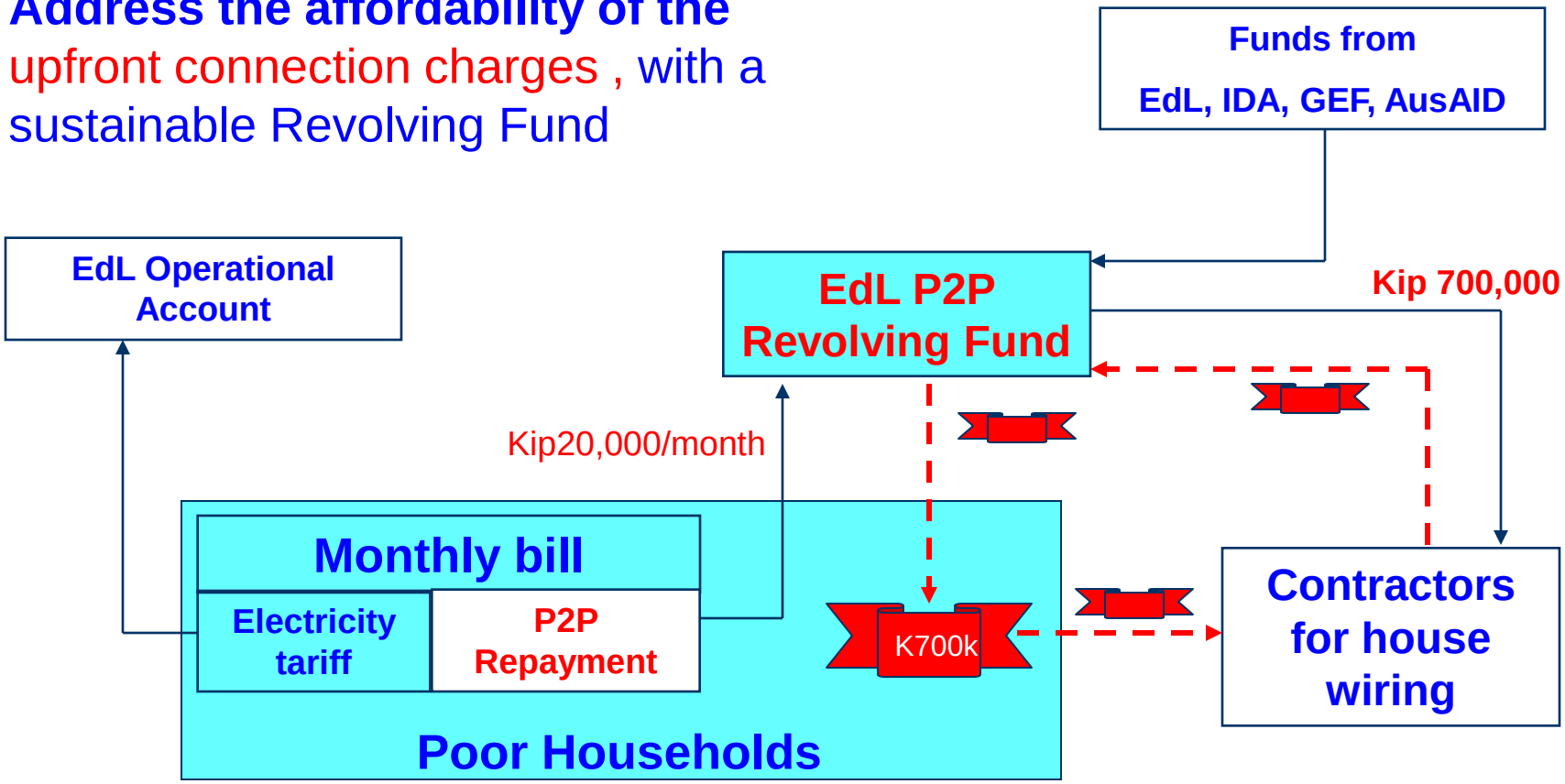
- A program designed to support the poorest households with a gender focus, to bring the benefits of access to electricity to the poor

Instrument

- Interest-free credit to qualifying households for payment of the upfront connection changes on installment plan basis

Power to the Poor (P2P) program
Instrument

Address the affordability of the upfront connection charges , with a sustainable Revolving Fund



Targeting the poor – Initial results and looking forward

Pilot program results (fall 2008-2009)

- 537 households in 20 pilot villages connected utilizing P2P credit
- Average connection rate increased from 65% to 95% in the pilot villages
- Connection rate among female-headed HH increased from 63% to 90%
- **Example: PHONSAAD Village,** electrified in 2002, 63 out of the 270 households not connected by 2008, and all the 63 households were connected to the grid in Feb-Mar 2009 with the P2P

Program scale up country-wide started March/April 2010

6. Reducing investment and operating costs Technical measures deployed by EDL

- **EdL's network design and expansion conform to best practice, balancing performance and cost considerations**
  - Network configurations configured to load characteristics
  - 22 kV (MV) lines - three-phase, two-phase, single-phase as appropriate
  - LV network optimization – transformer sizing, line phasing

- Single wire earth return network design – **SWER** - utilized in several sub-project areas in the Southern region with small and dispersed loads

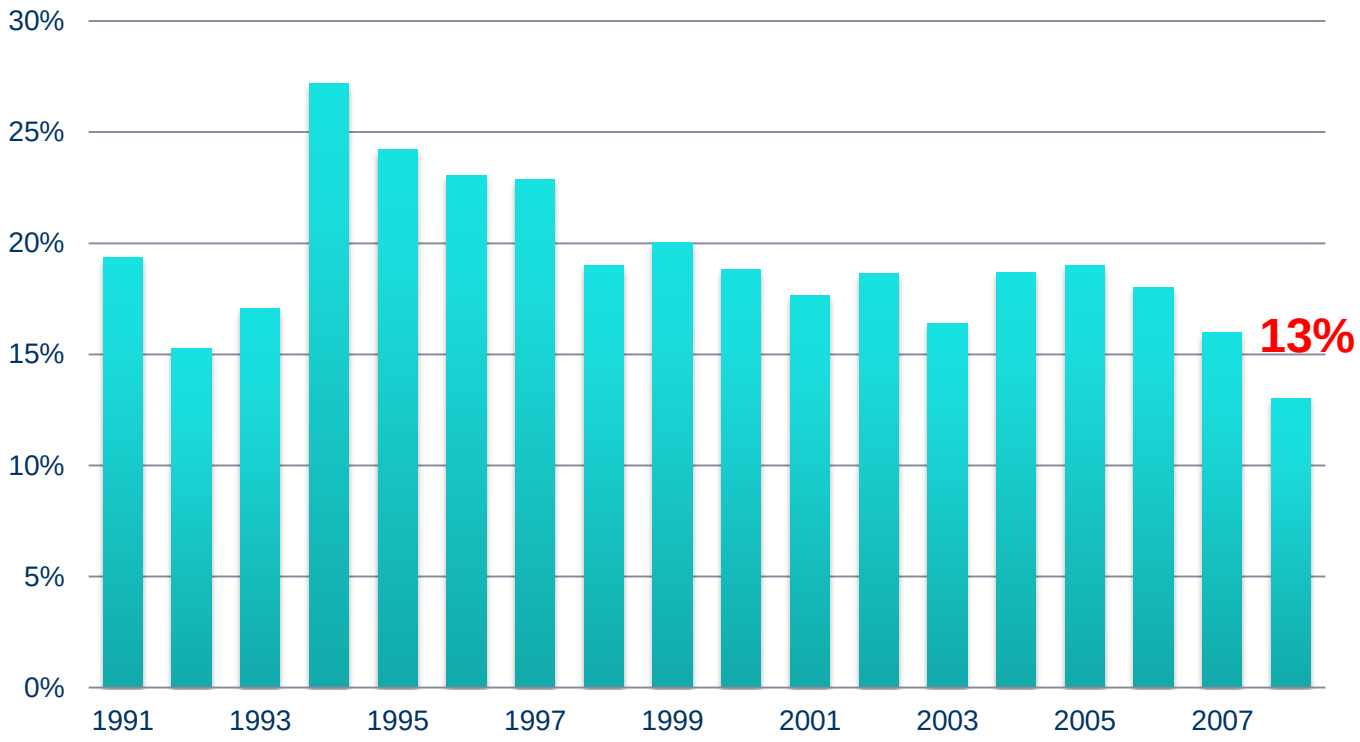
- **Shield Wire** on HV transmission lines in Northern region facilitate low cost connections (avoiding need for high cost substations) to serve small customer clusters living close to the high voltage line

6. Reducing investment and operating costs Technical measures deployed by EDL

Loss reduction programs reduced technical and non-technical loss in EDL network

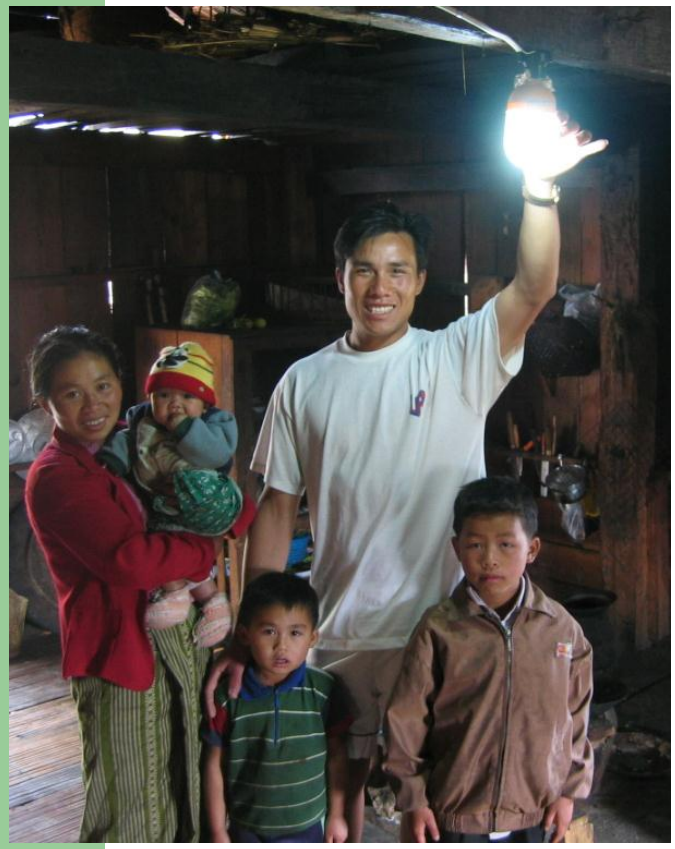
- State-of-art software and hardware, computerized billing and accounting (BAS)
- Replacement of old meters, speed up meter installation process, increase meter reading frequency
- Staff training and performance bonus

EDL's distribution system loss has been systematically reduced to 13% by 2009



Sources: Electricite du Laos, Annual Report 2008

THANK YOU



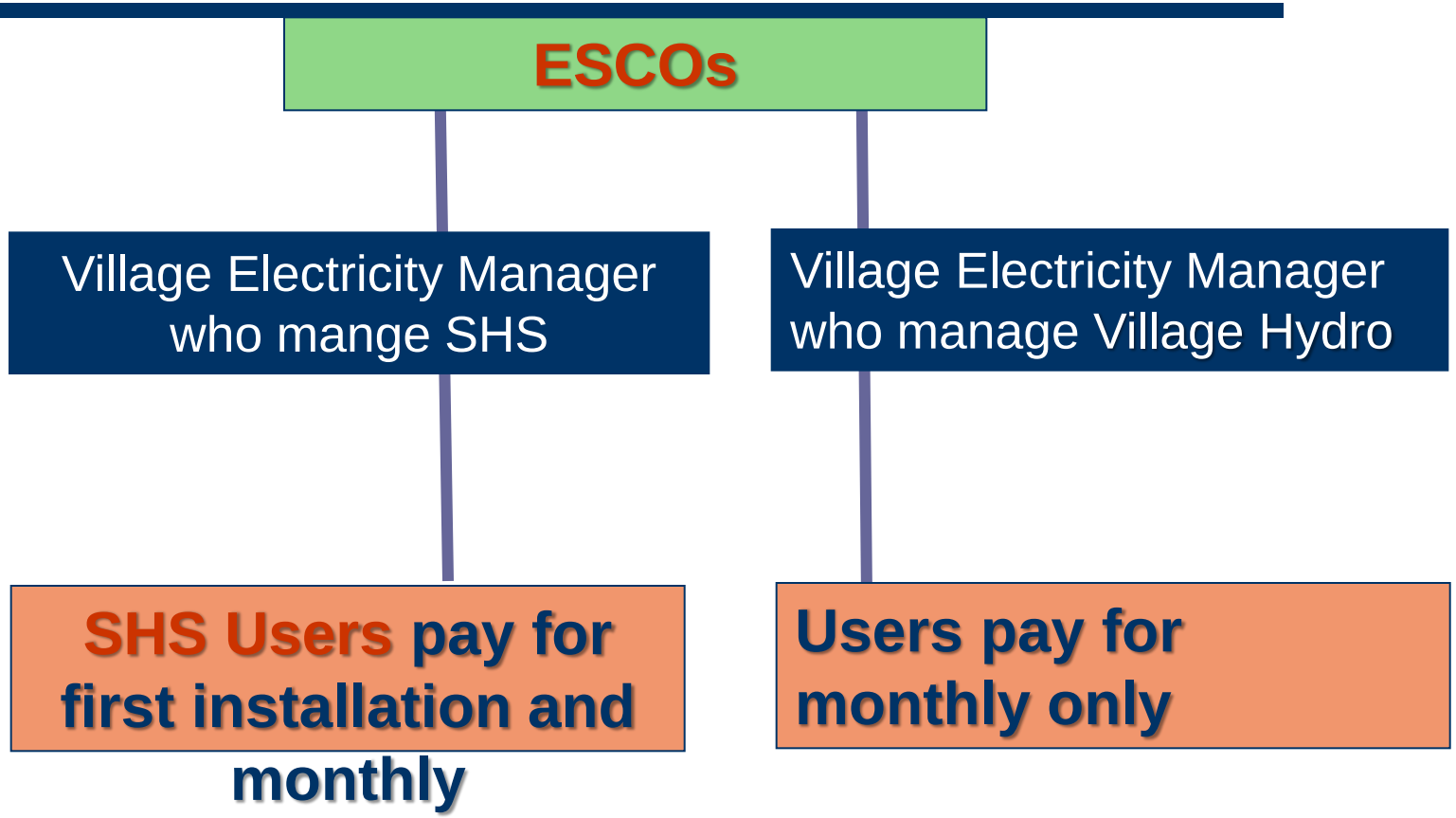
BACK-UP

EDL'S TARIFF STRUCTURE 2005-2011, WITH HEAVY SUBSIDIES TO RESIDENTIAL AND IRRIGATION ELECTRICITY CONSUMPTION TO ENSURE SOCIAL BENEFITS

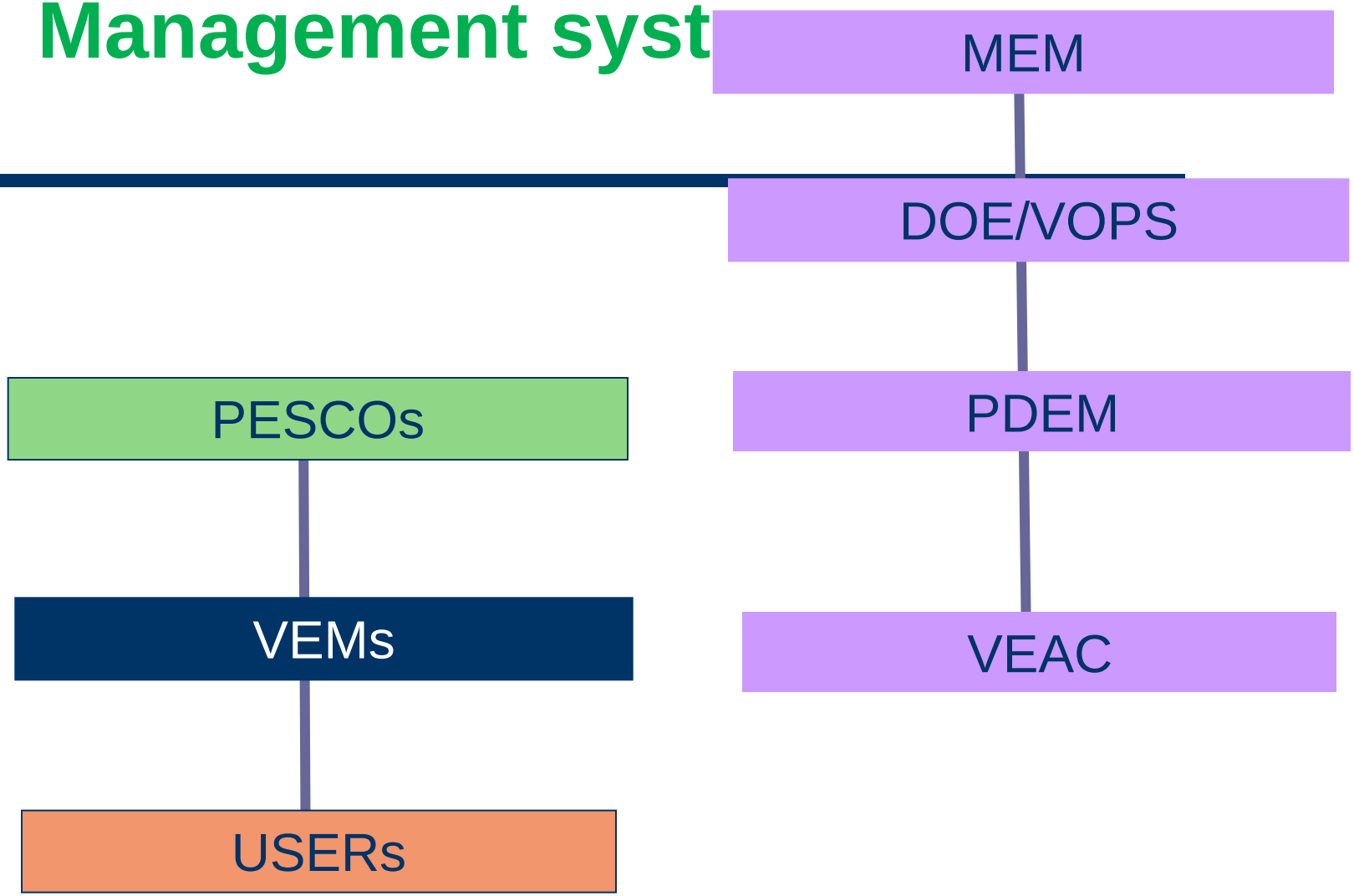
BACK-UP

MEM'S SOLAR HOME SYSTEM DELIVERY MODEL UNDER ITS OFF-GRID ELECTRIFICATION PROGRAM

Existing Model:
(Hire-ŒPurchase/ Rent – to – Buy)



Implementation and Management syst



Back up

Institutional framework comprising specialized and effective implementing agency(s) for grid and off-grid, and promoting public and private partnerships