Current Status of Electrification in Viet Nam

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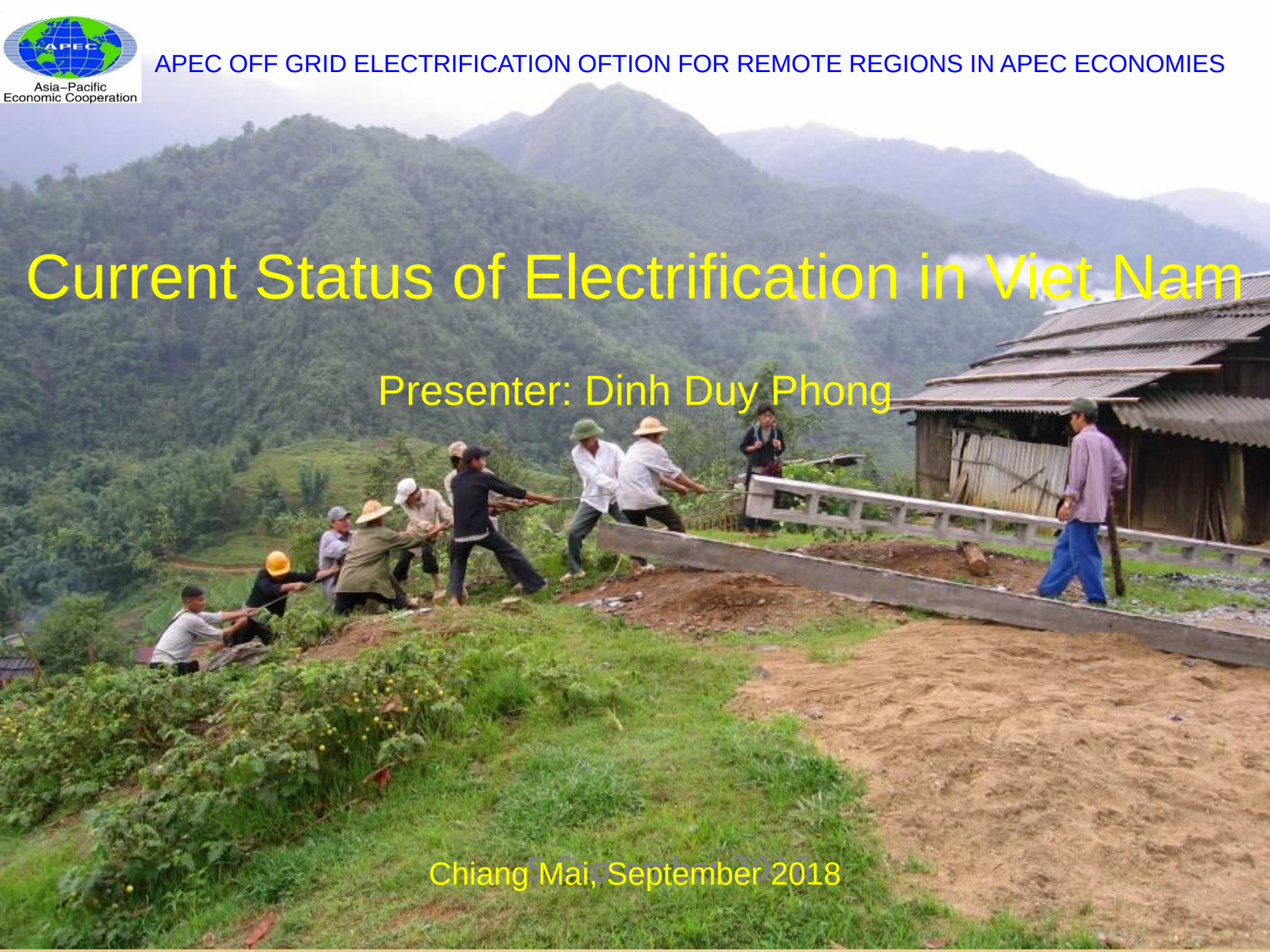
Chiang Mai, September 2018



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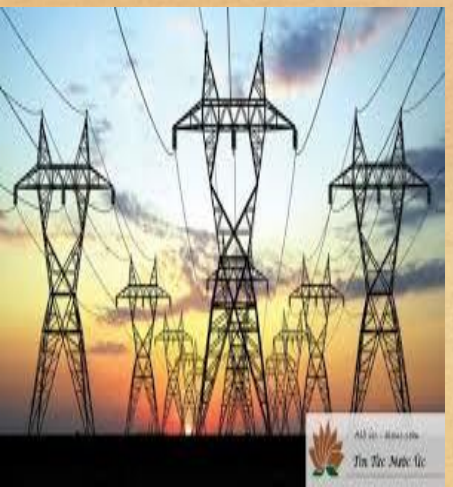



1. Background

- Population: 93.7 million persons;
- Area: 331,698 km2;
- Urban population: 32.9 million persons (35.1%);
- GDP (nominal): US$220 billion → 2,385 US$ per capita;
- GDP growth rate: 6.2% p.a. in 2005-2017;
- Primary energy consumption: ~78.3 MTOE (→ 835.7 kgoe per capita;
- Total electricity consumption: 174 TWh → 1,852 kWh per capita;
- Electrification rate: 98.95% of rural households (end of 2016);

2. Power system of Viet Nam

General of Power System in Viet Nam

Transmission

Item	Unit	Quantity
500 kV lines	km	7,446
220 kV lines	km	16,071
500 kV transformers	MVA	26,100
220 kV transformers	MVA	41,538

Distribution

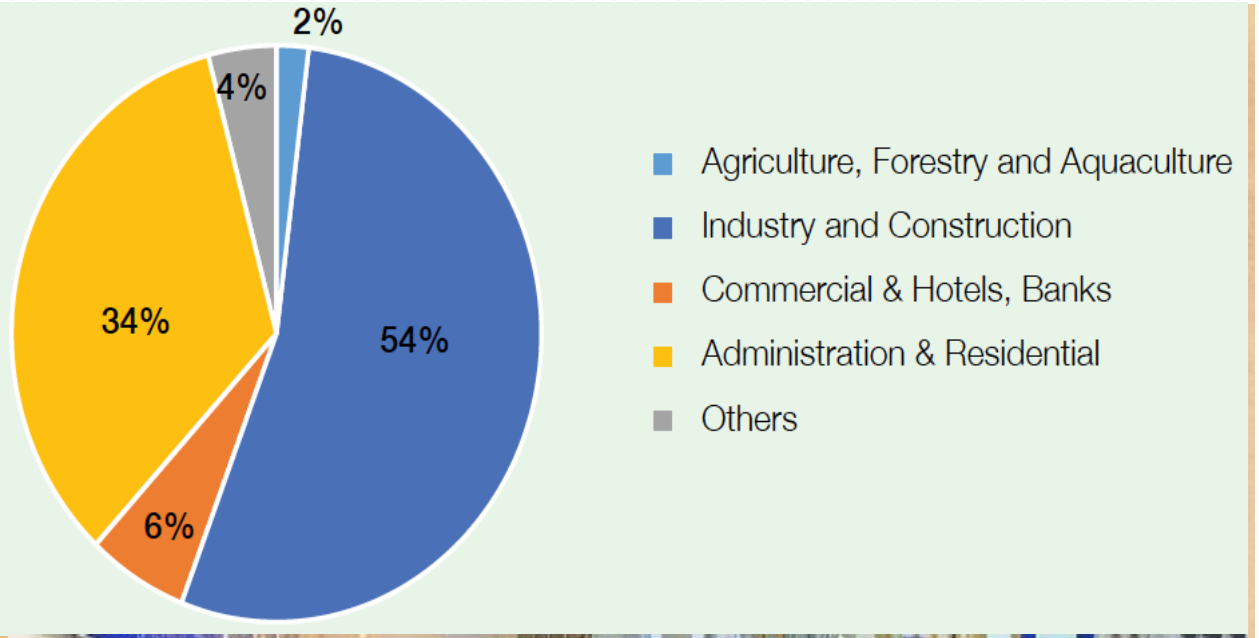
Item	Unit	Quantity
220 kV lines	km	108
110 kV lines	km	19,335
Medium and low voltage lines	km	495,688
220 kV transformers	MVA	3,250
110 kV transformers	MVA	52,360
Medium and low voltage transformers	MVA	89,609

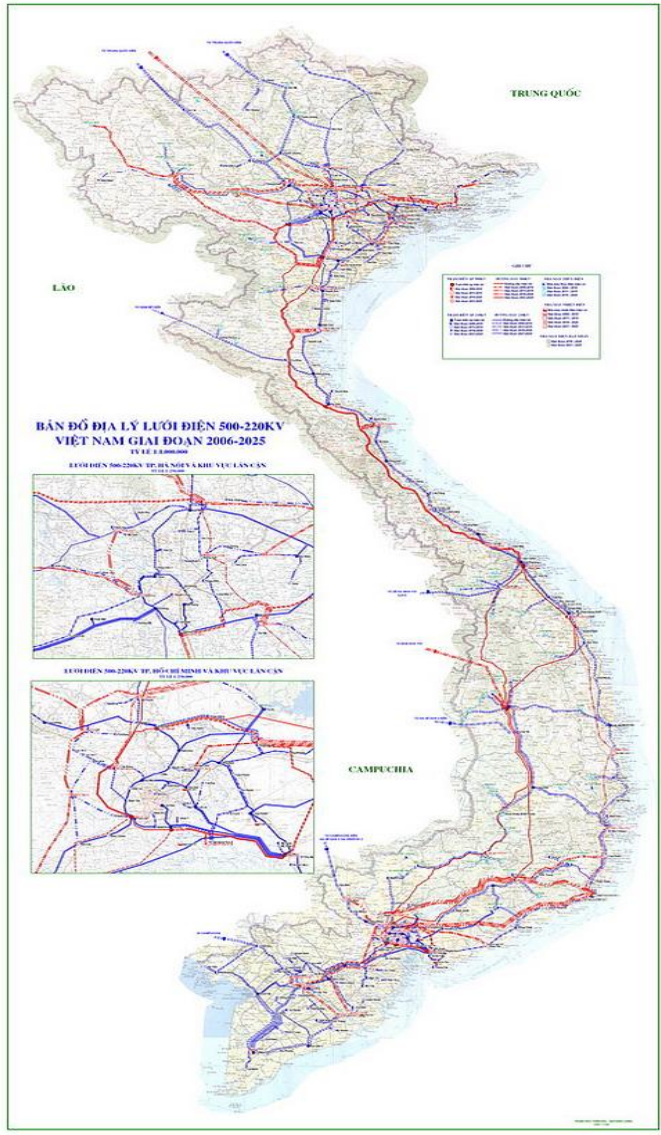
Plan to 2030

Item	Unit	2016-2020	2021-2025	2026-2030
500 kV substation	MVA	26,700	26,400	23,550
220 kV substation	MVA	34,966	33,888	32,750
500 kV lines	km	2,746	3,592	3,714
220 kV lines	km	7,488	4,076	3,435

2. Power system of Viet Nam

The rate of power supply

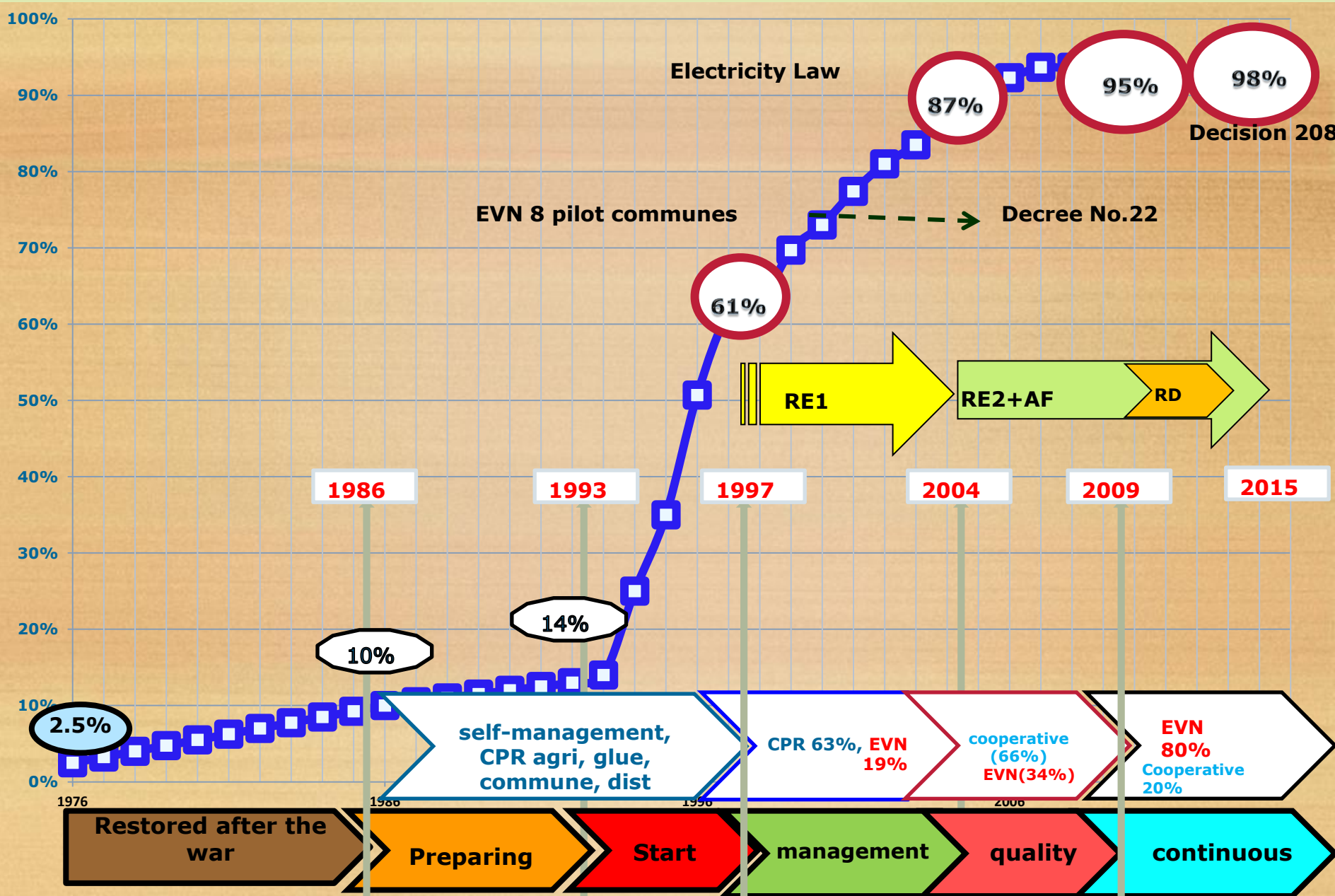




BẢN ĐỒ ĐỊA LÝ LƯỚI ĐIỆN 500-220KV
VIỆT NAM GIAI ĐOẠN 2006-2025

Source: EVN's annual report 2017

3. Current Status of Rural Electrification in Viet Nam



3. Current Status of Rural Electrification in Viet Nam

Period 1: Restored after the war (1976-1985): (2.5% to 9.3%)

- The country's economy in restored after war
- National Power System only supplied to cities and industry areas
- Power consumtion about 44 kWh/person (1976) to 70 kWh/person (1985)
- In Rural area only supplied the power to pumb station of agriculture

3. Current Status of Rural Electrification in Viet Nam

Period 2: Preparing (1986-1993): (10% to 14%)

- 1986 VN have innovation policy, after 2 years, VN from imported rice to be exported country of rice.
- 1990 VN agricultural tax exemption, so many commune used electricity to rural electricity
- Power sources began to rise
- Power transmission line 500 kV began to be installed

3. Current Status of Rural Electrification in Viet Nam

Period 3: Start (1994-1997): (14 % to 61%)

This period has many milestone:

- Number of rural household were connected to national grid to be jumpy (14 % to 61 %), average growth rate is 15.3%/year (~ 1.6 mls household/year)

- It is spontaneous process by power demand

- Not formed a management system organized and no standard for rural grid

3. Current Status of Rural Electrification in Viet Nam

Period 3(1994-1997): Start (14 % to 61%)

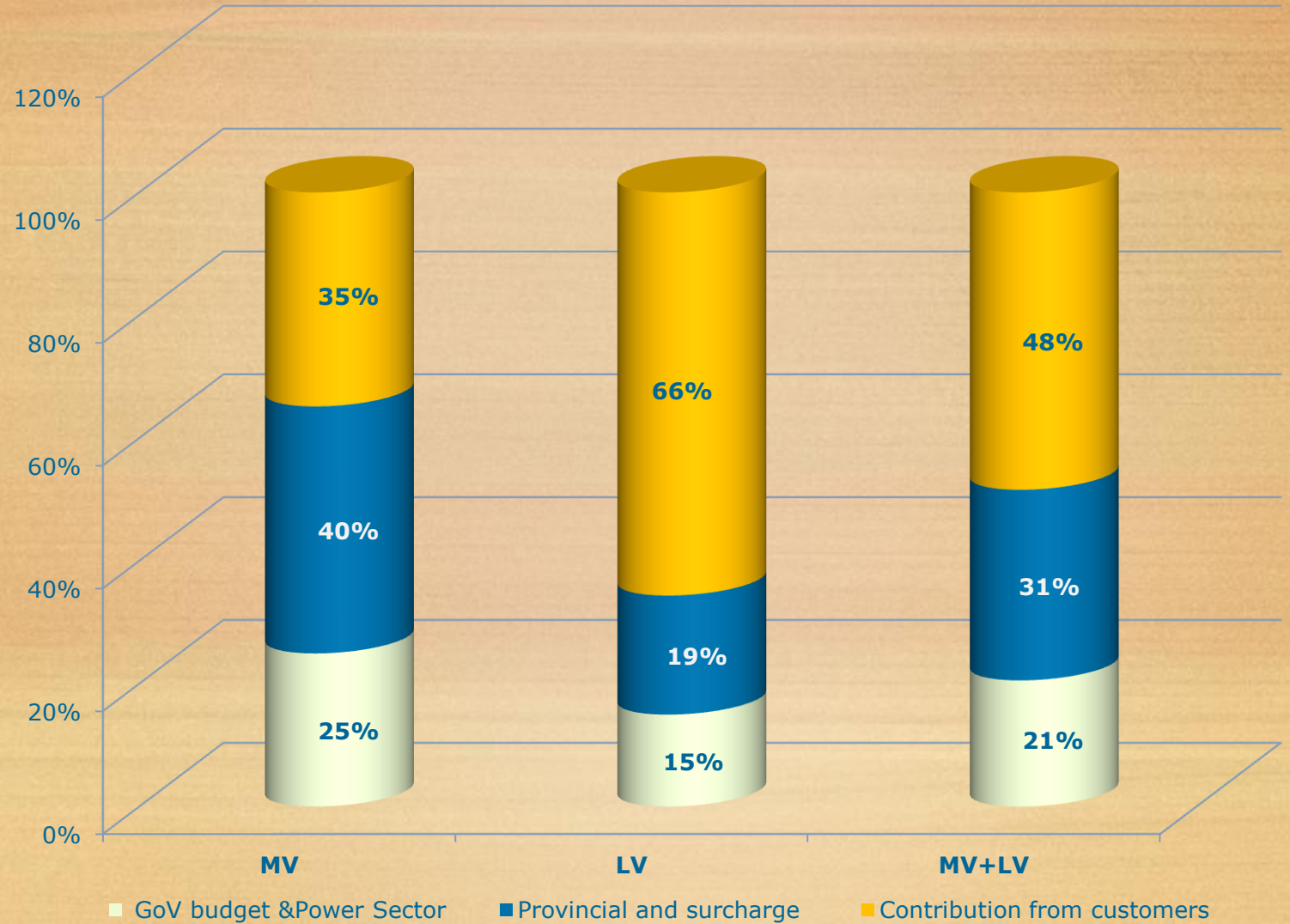
This period was a key driver for development, but also to the many problems:

- Electricity demand in rural areas become more urgent
- Conditions necessary to Power Source: HB hydro power plant (1920 MW)
- Transmission Grid: 500 kV transmission line (connected from North – South area)
- Capital for this period mainly from the local and population

3. Current Status of Rural Electrification in Viet Nam

Period 3(1994-1997): Start (14 % to 61%)

- Motivation and financial contributions of the phase 3:



3. Current Status of Rural Electrification in Viet Nam

Period 4 (1998-2004): Improvement of management (61 % to 87 %)

- The rate of grid connected annual fell 3.7%
- The proportion of investment capital transfered to the electricity sector (Electricity of Vietnam)
- Policy, legal and technical aspects of rural electrification programs were seted (Decree No 22; No 45 and Power Law)
- Received the active involvement of international organizations: WB, ADB, Sweden…

3. Current Status of Rural Electrification in Viet Nam

Period 5: Moving from quantity to quality (92 % to 95 %)

- Consolidated the requirements of management
- Moved from expansion to renovation
- Direct assistance from the central budget, the investment mechanism formed for ethnic minority regions

3. Current Status of Rural Electrification in Viet Nam

Period 6: Uniformity for the quality of the final phase

- Importan milestone of this phase is the Government's Decision No 21 (2009) and Government's Decision No 2081 (2013)
- Electricity prices for household consumers have agreed on a common price for urban and rural areas, according to the price of stairs
- Most of the management units have weak capacity at the local were handed over the power grid to power company

3. Current Status of Rural Electrification in Viet Nam

Percentage of Rural Electrification

Year	2011	2012	2013	2014	2015	2016
Communes	98.72%	99.36%	99.57%	99.70%	99.85%	99.97%
Rural households	96.65%	97.19%	97.85%	98.05%	98.49%	98.69%




4. The Target of Rural Electrification in Viet Nam

The Target of Rural Electrification Program in Vietnam Period 2017-2020:

Suppy Electricity for **1.090.900** households (99,9%):

+ 500,000 households have not electricity,

+ 509,900 household to supply themselves: low quality, unsafe and high power losses…

+ 17 communes (100%)

+ 9.753 villages (100%)

The progress made in meeting energy target and main strategy

- Development of transmission line power system for voltage levels;

- National grid connection to local gid: Mid-Voltage, Low-Voltage, Development of Distribution Line, Transformation…

- Innovation of management and operation mode, power business

- Development of Renewable Energy source (solar energy, wind power, biogas, …)

5. The main challenges in meeting the target

- The remaining households mostly from mountainous areas and islands, terrainand
- Transportation and installation are difficulties; Investment's cost is hight.



5. The main challenges in meeting the target

- Electricity consumption in rural areas are very small; All most of rural power projects are not economically feasible

→ This has hindered the investment process

- Vietnam have just removed from the list of poor countries

→ It is very difficult to access preferential loans

Thanks for your attention!

Chiang Mai, September 2018