

Cambodian Power Development Plans

Ministry of Industry, Mines and Energy

Phnom Penh, Cambodia, September 29-30 2009

Overview of Power Sector

- Cambodia's power sector was rehabilitated since 1995
- EDC's Capacity output in P.Penh 2008 : 217 MW and 1,271 GWh
- Projection in Cambodia 2024 : 3045.33 MW and 16244.61 GWh
- At present, only 20 % of households has access to electricity
- Annual energy consumption per capita: 103 kWh
- 22 small isolated power systems
- High potential of hydro source : more than 10,000 MW

Energy Policy

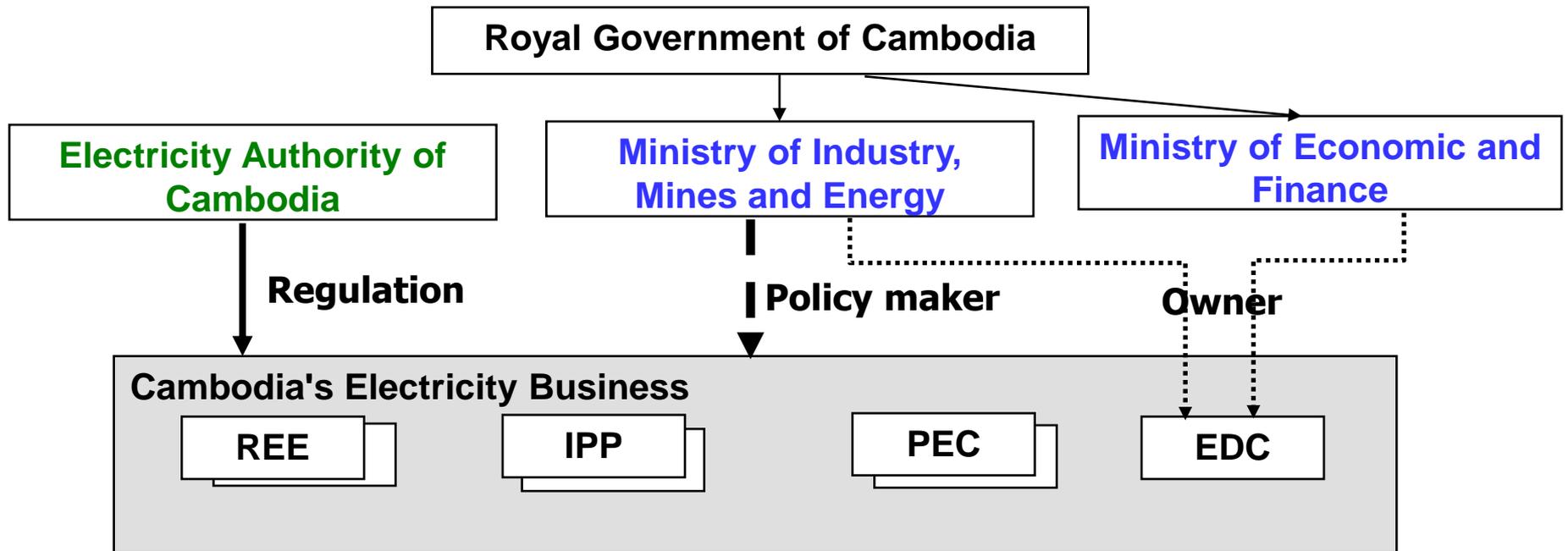
To provide an adequate supply of energy throughout Cambodia at reasonable and affordable price,

To ensure a reliable and secured electricity supply at reasonable prices, which facilitates the investments in Cambodia and developments of the national economy,

To encourage exploration and environmentally and socially acceptable development of energy resources needed for supply to all sectors of Cambodia economy,

To encourage the efficient use of energy and to minimize the detrimental environmental effects resulted from energy supply and consumption.

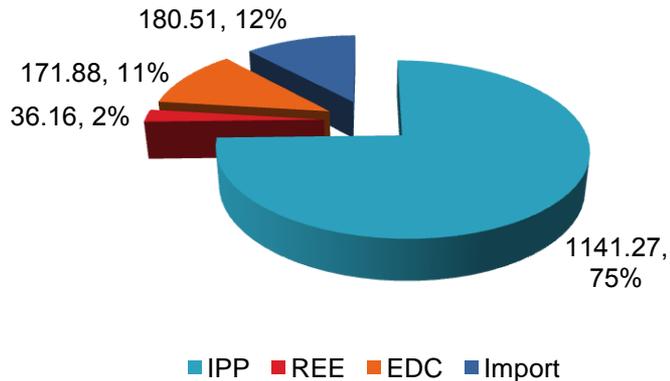
Current Structure of Electricity Sector



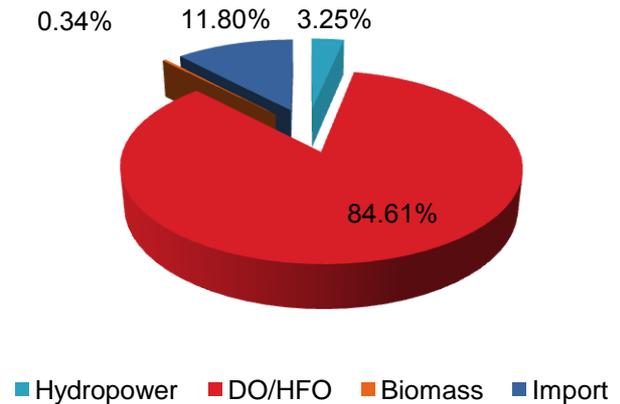
-➔ Ownership of EDC
- - - ➔ Policy; Planning; Development; Technical standard
- ➔ Tariff, license, finances and performance; Enforce the regulations, rules and standards

Energy Status

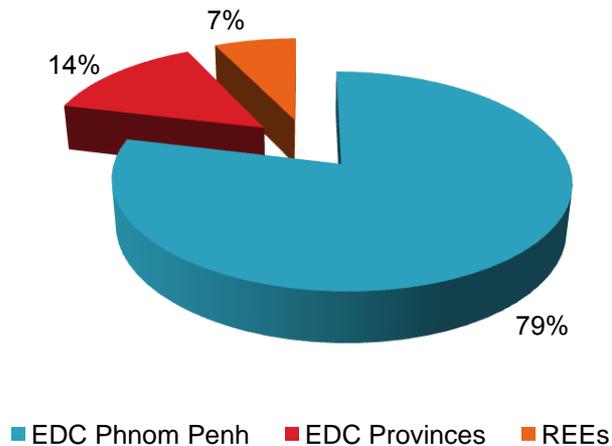
Energy Dispatched (GWh) in 2007



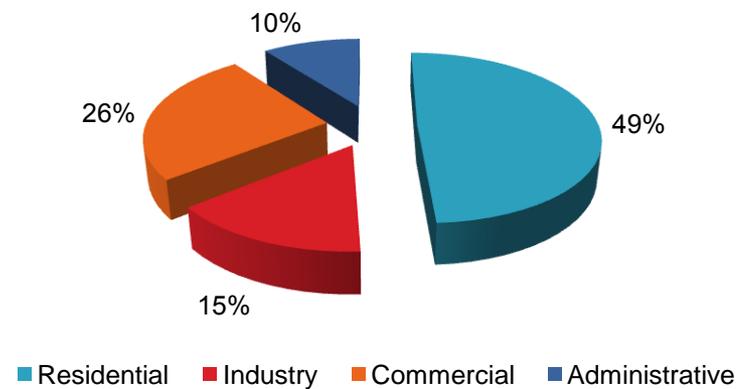
Generation by Fuel Type (GWh) in 2007



Energy Distributed by Areas

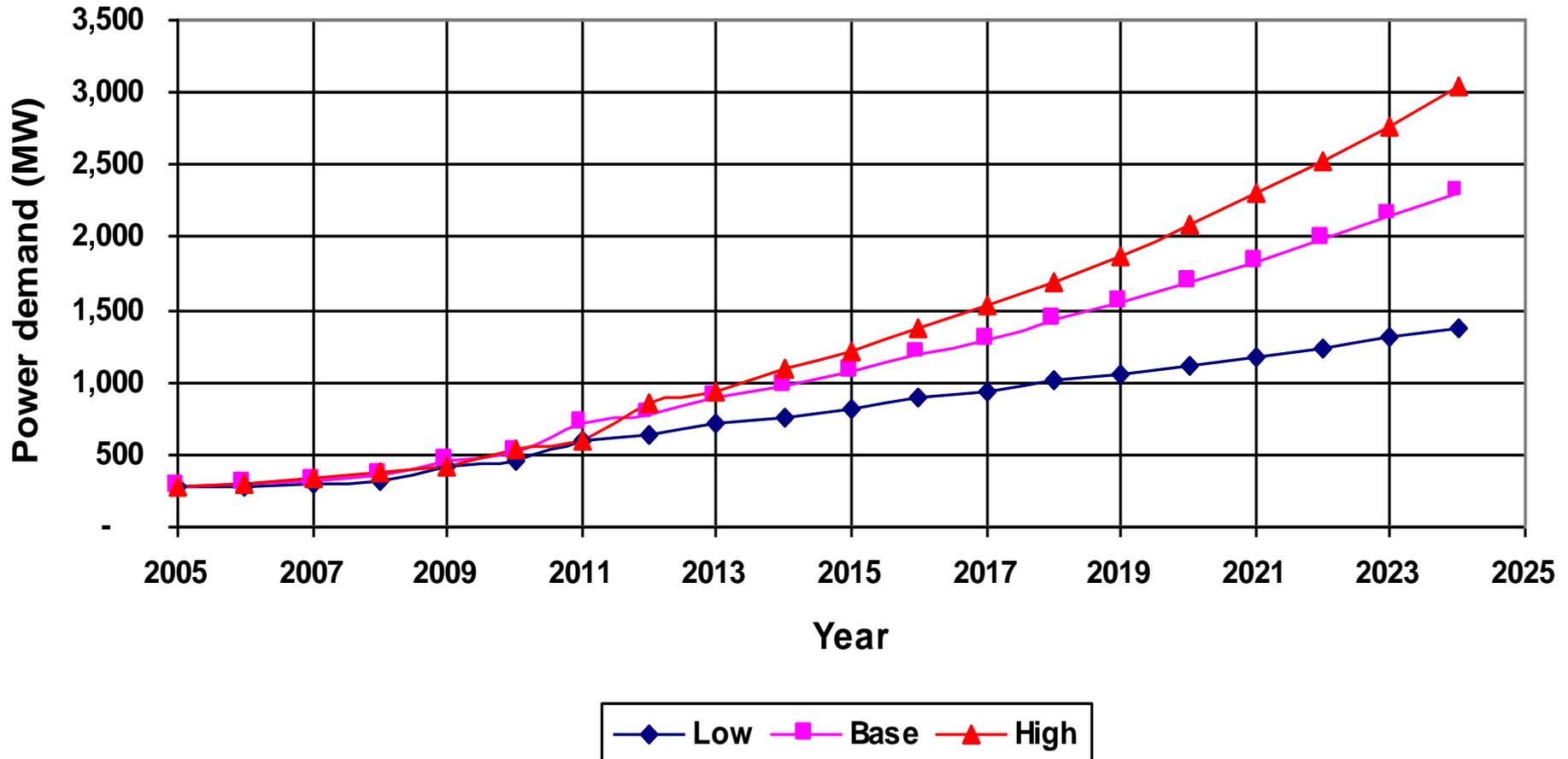


Energy Consumption by Sectors in 2007



Cambodia Power Demand

Power Demand in Cambodia (in Power Grid)



Cambodia Power Sector Strategy

Cambodia Power Strategy Components:

A- Development of Generation and Transmission

B- Power trade with neighboring countries

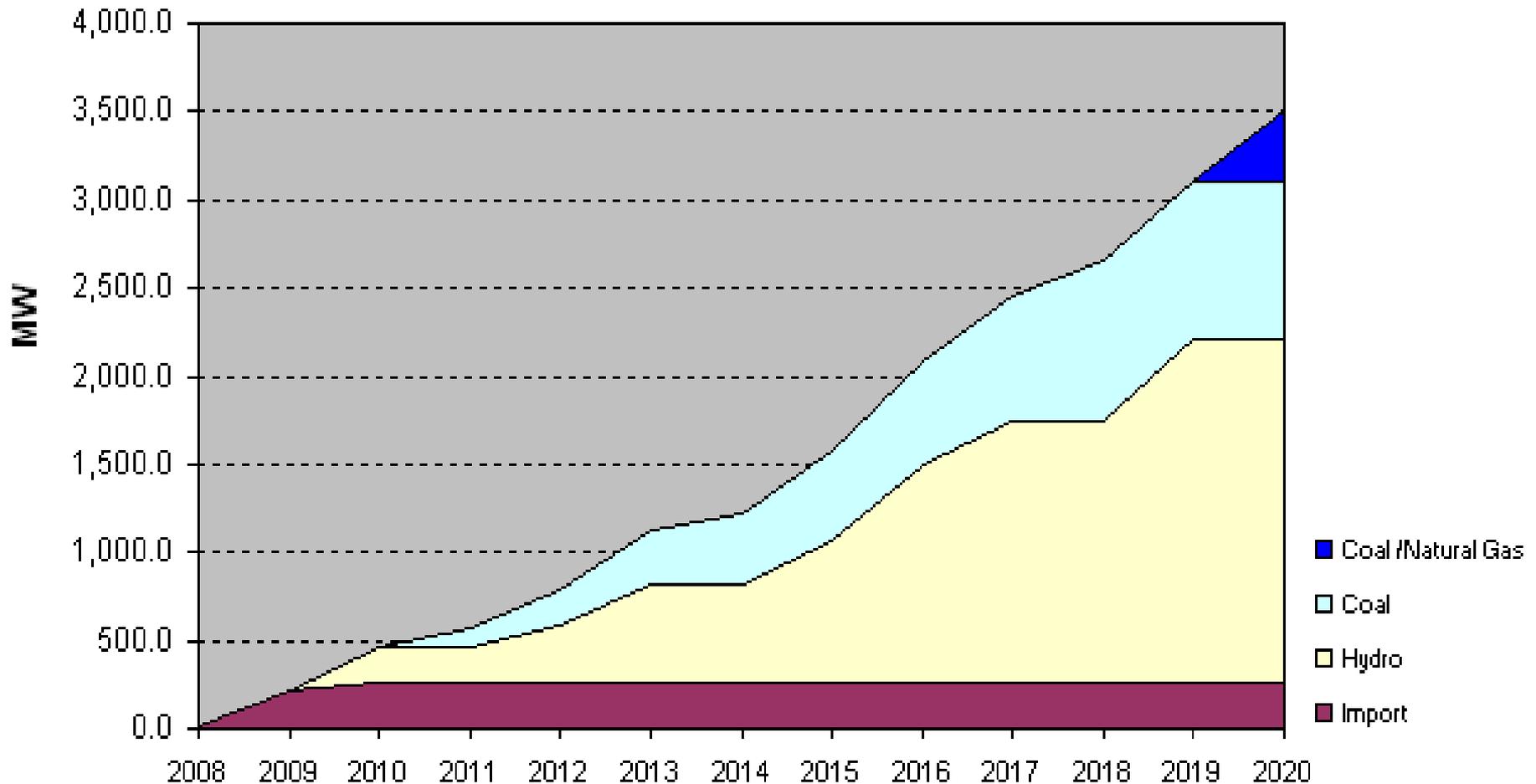
C- Provincial and Rural Electrification Program

No.	A. Generation Expansion Plan	Fuel	MW	Year	Export
1	Kamchay Hydro Power Plant	Hydro	193.2	2011	
2	200 MW Coal Power Plant (I) in Sihanouk Ville - Phase 1	Coal	100	2011	
3	Kirirom III Hydro power Plant	Hydro	18	2012	
4	Atay Hydro Power Plant	Hydro	110	2012	
5	200 MW Coal Power Plant (I) in Sihanouk Ville - Phase 2	Coal	100	2012	
6	Tatay Hydro Power Plant	Hydro	246	2013	
7	Lower Stung Rusey Chhrum Hydro Power Plant	Hydro	338	2013	
8	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 1	Coal	100	2013	
9	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 2	Coal	100	2014	
10	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 3	Coal	100	2015	
11	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 4	Coal	100	2016	
12	Lower Sesan II + Lower Srepok II	Hydro	420	2016	Oriented
13	Stung Chay Areng Hydro Power Plant	Hydro	108	2017	
14	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 5	Coal	100	2017	
15	700 MW Coal Power Plant (II) in Sihanouk Ville -Phase 6	Coal	200	2018	
16	Steung Treng Power Plant	Hydro	980	2018	Oriented
17	Sambor Hydro Power Plant	Hydro	2600	2019	Oriented
18	Coal Power Plant (III) or Gas Power Plant	Coal/NG	450	2020	

No.	Projects under Implementation	Fuel	MW	Year
1	Kamchay Hydro-project	Hydro	193	2011
2	Atay Hydropower plant	Hydro	120	2012
3	Lower Russei Chhrum Hydropower plant	Hydro	338	2013
4	Kirirum III	Hydro	18	2012
5	Tatay	Hydro	246	2013

No.	Committed Projects for Private Sector's Study	Fuel	MW	Others
1	Sambor Hydro-project	Hydro	2600	
2	Lower Sesan 2 Hydro-project	Hydro	420	
3	Lower sesan 3 Hydro-project	Hydro	375	
4	Lower Srepok 3 Hydro-project	Hydro	330	
5	Lower Srepok 4 Hydro-project	Hydro	235	
6	Stung Battambang 1 Hydro-project	Hydro	24	
7	Stung Battambang 2 Hydro-project	Hydro	36	
8	Stung Pursat 1 Hydro-project	Hydro	100	
9	Stung Pursat 2 Hydro-project	Hydro	17	
10	Prek Liang 1 Hydro-project	Hydro	64	
11	Prek Liang 2 Hydro-project	Hydro	64	
12	Stung Sen Hydro-project	Hydro	38	
13	Stung Treng Hydro-project	Hydro	980	

Generation Expansion Plan (2008 – 2020)



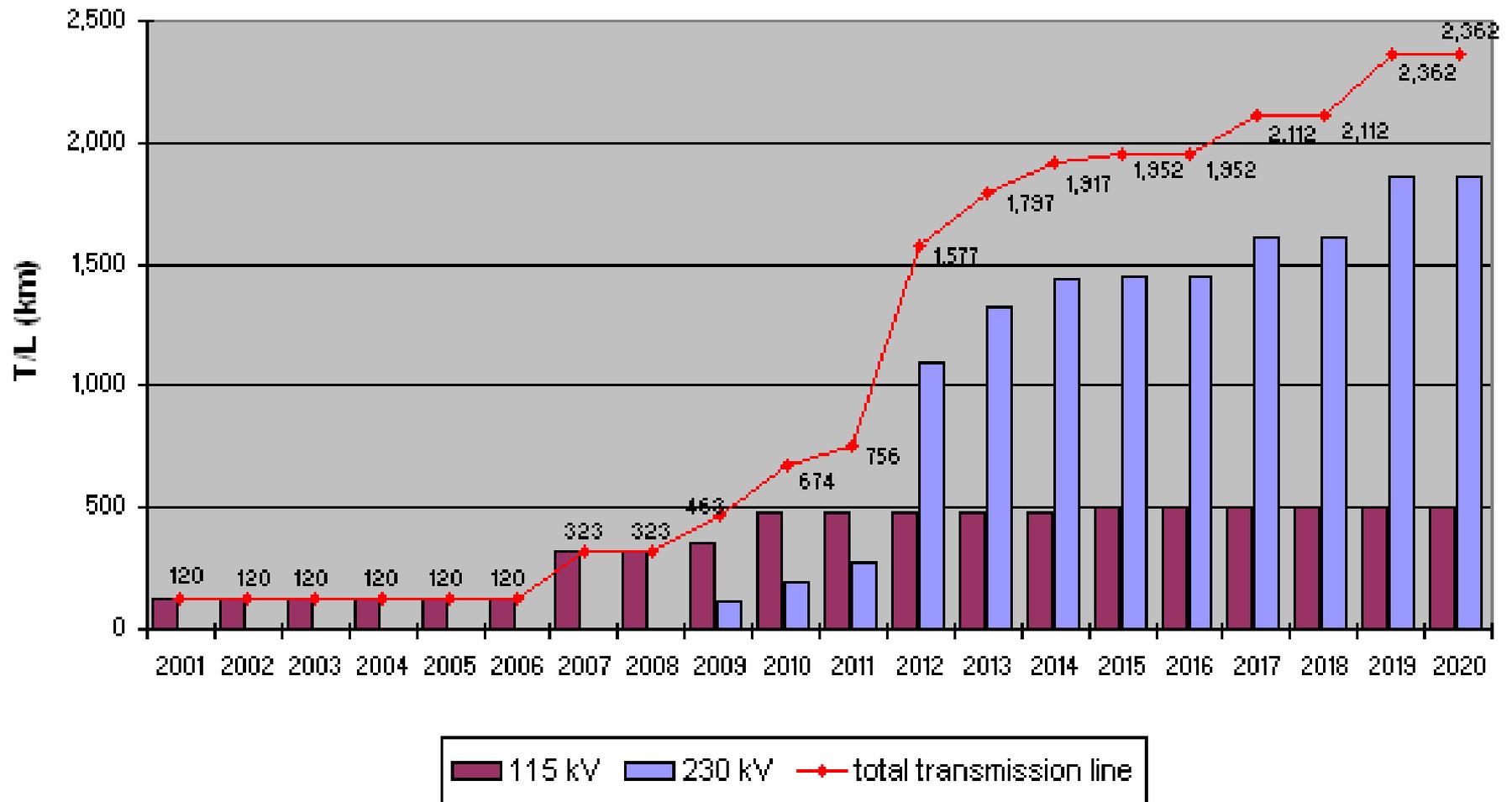
Transmission

- 115 kV BOT interconnecting with Thailand to supply Banteay Meanchey, Siem Reap and Battambang
- 115 kV Vietnam (Tai Ninh) - Kampong Cham, BOT (2011)
- 115 kV Lao (Ban Hat) - Stung Treng, WB (2011)
- 230 kV Phnom Penh - Kampong Cham, BOT (2012)
- 230 kV Phnom Penh Battambang via Kompong Chhnang-Pursat, BOT(2012)
- 220 kV Phnom Penh Viet Nam via Takeo ,ADB+NDF (2009)
- 230 kV Takeo – Kampot, KfW (2011)
- 230 kV Kampot – Sihanoukville , ADB+JBIC (2011)

No.	Existing Transmission and Expansion Plan	Year Operation	T/L (km)
1	115 kV, Kirirom I - Phom Penh, BOT	2001	120
2	115 kV, Thailand - Bantey Meanchey - Siem Reap – Battambang, BOT	2007	203
3	220 kV, Phnom Penh - Takeo - Viet Nam, (construct the substation in Takeo), (ADB + NFD)	2009	110
4	115 kV, Reinforcement of transmission line and construct substation at WPP (West Phnom Penh), (WB)	2009	30
5	230 kV, Takeo - Kompot, (construct substation in Kompot), (KFW)	2011	87
6	115 kV, Steung Treng - Loa PDR, (construct substation in Steung Treng), (WB)	2011	56
7	110 kV, Kampong Cham - Viet Nam, Substations: Soung, - Pongnearkreak BOT	2011	68
8	230 kV, Kampot - Sihanouk Ville, (construct 2 substations: - Vealrinh - Sihanouk Ville), (ADB + JBIC)	2011	82
9	230 kV, Phnom Penh - Kompong Chhnang - Pursat - Battambang, (construct 3 substations: - Kompong Chhnang, - Pursat, - Battambang), BOT	2012	310
10	230 kV, Pursat - Osom, (construct 1 substation in Osom Commune), BOT	2012	175
11	230 kV, Kampong Cham – Kratie, BOT	2012	110

No.	Existing Transmission and Expansion Plan (Con.)	Year Operation	T/L (km)
12	230 kV, Kratie – Stung Treng, (India)	2012	126
13	230 kV, Phnom Penh – Kampong Cham, BOT	2012	100
14	220 kV, Phnom Penh – Sihanoukville, along national road 4, BOT	2013	220
15	230 kV, Phnom Penh – Neakleung – Svay Rieng, (construct 2 substations: - Neakleung, - Svay Rieng), BOT	2014	120
16	230 kV, Stung Tatay Hydro – Osom substation, BOT	2015	15
17	115 kV, West Phnom Penh – East Phnom Penh (construct substation GS4 at South Phnom Penh), BOT	2015	20
18	230 kV, Reinforcement of transmission line on the existing pole, Phnom Penh – Kampong Cham (transmit power from Lower Sesan II + Lower Srepok II)	2017	100
19	230 kV, Stung Chay Areng - Osom substation, BOT	2017	60
20	230 kV, Kampong Cham - Kampong Thom - Siem Reap, (construct 1 substation in Kampong Thom), BOT	2019	250
Total Transmission Line			2,362

Transmission Expansion Plan (2001 – 2020)



B-Power Trade

- Import from Vietnam at High voltage 220 kV with capacity of 200 MW by 2009
- Import from Thailand at 115 kV starting November 2007 to serve northern grid up to 80 MW
- Import from Vietnam to Kampong Cham Province at high voltage 115 kV with capacity of 20 MW by 2011
- Import from Lao to Stung Treng Province at 115 kV with capacity until 20 MW by 2011
- Power Interconnection at high voltage 500 kV, Lao - Cambodia – Vietnam, ADB (2018)
- 10 Cross border MV links from Vietnam and 8 from Thailand at 22 kV to serve Cambodian communities close to the border.

C-Provincial and Rural Electrification

- Grid extension & Rural Elect. Program: WB SDR27.9 mil., GEF \$5.75 mil.
- Renewable energy master plan study and 2 micro hydro development by JICA
- Rural Electrification target:
 - 100% of villages has access to electricity services by 2020
 - 70% of rural population has access to quality electricity services by 2030
- Rural Electrification Fund to subsidize part of rural electrification projects.



End of Presentation



Thank you for your attention.



BCS

