Cambodia’s Energy Sector

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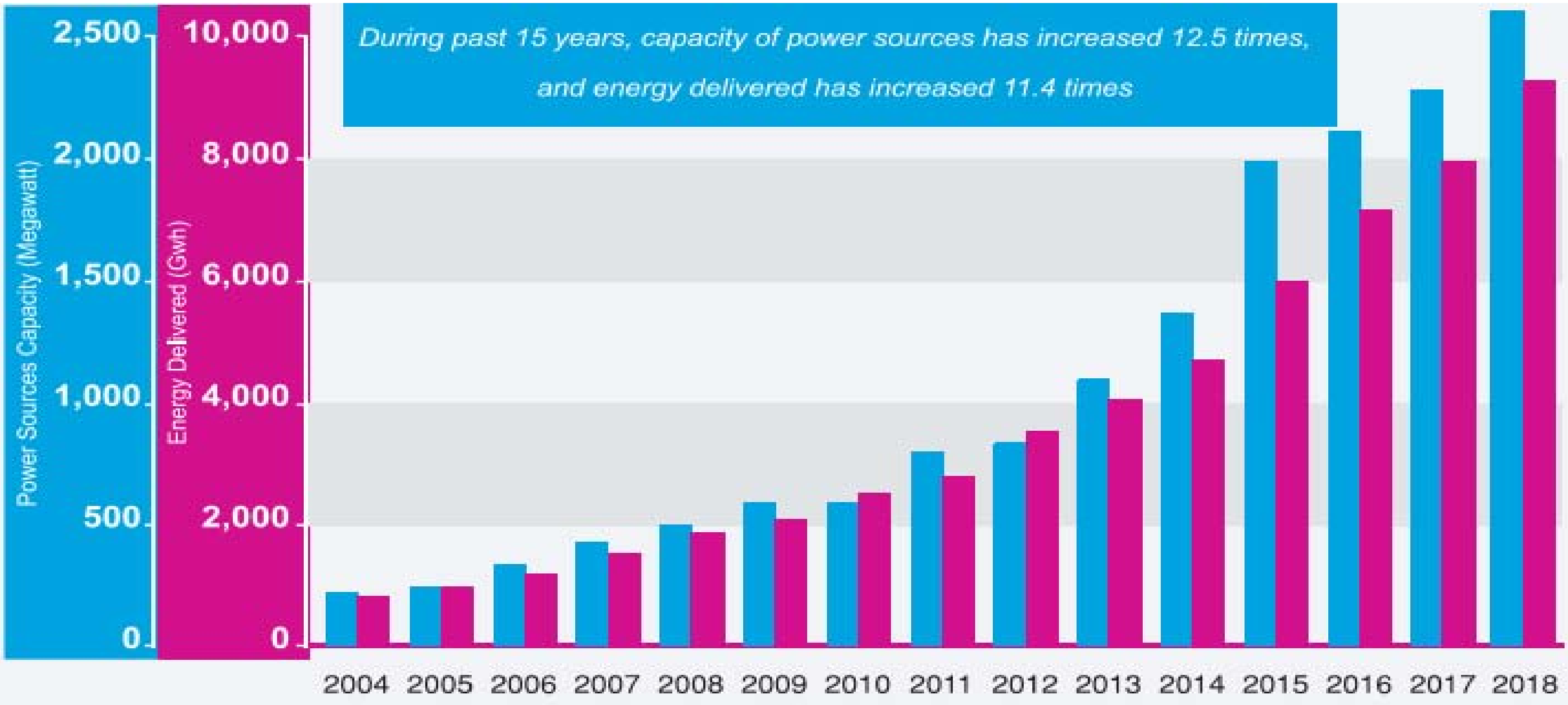
Introduction

- Cambodia is known to have achieved a good result from MDG implementation
- In 2009, the total primary energy demand amounted to 5.2 million tons of oil equivalent, of which 71.7% was biomass and 28.2% was imported oil. Only 0.1 % was hydropower.
- In 2014, the government made ‘electricity access for [all] Cambodian villages by 2020’ a top priority in the fifth mandate.
- To achieve this goal, the National Policy, Strategy and Action Plan on Energy Efficiency was adopted I 2013, while cooperation and participation from stakeholders including ministries and other governmental agencies, development partners and private investors have also played an important role.

- By means of this policy, it is envisaged to:
  - **Improve the living standard of the population,**
  - **Increase the competitiveness of the Cambodian economy,**
  - **Decrease the dependency on imported fuels and Protect the natural environment of the country.**

- Currently, 97.6% of Cambodian households have access to at least one source of electricity – 71.5% from the grid and 26.1% off the grid, from sources such as solar home systems and rechargeable batteries (World Bank, 2018)

Progress of Power Sources 2004-2018



Power Sources Capacity (MW)	208	231	325	419	490	579	584	793	825	1,088	1,359	1,986	2,115	2,322	2,650
Energy Delivered (GWh)	814	977	1,203	1,517	1,858	2,077	2,515	2,788	3,527	4,051	4,713	5,990	7,175	8,073	9,307
Energy Increase (%)	15.41	19.80	24.46	26.73	22.52	11.76	21.08	13.26	23.84	14.83	16.35	27.09	19.79	14.78	15.29

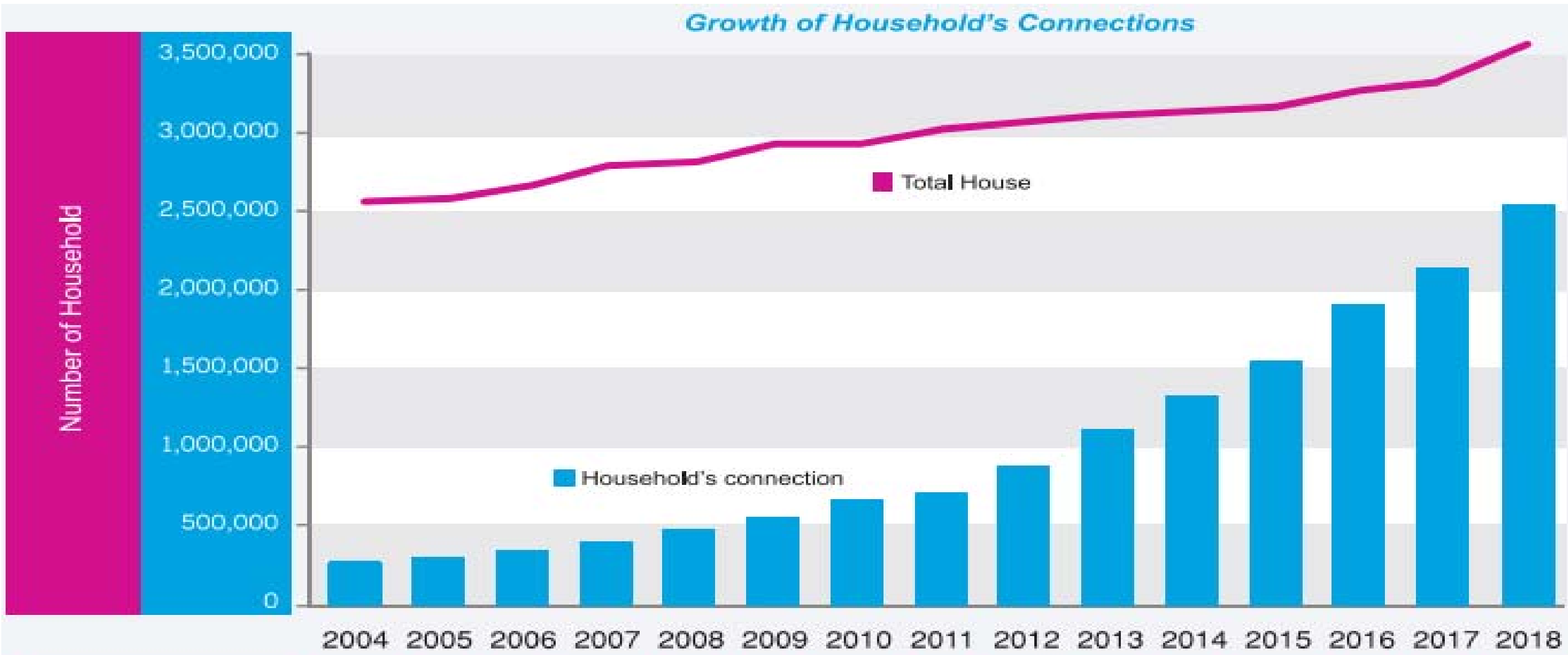
Sources of Power in Cambodia-Domestic

Power Sources	2017			2018			Plan for 2019		
	MW	GWh	%	MW	GWh	%	MW	GWh	%
1. Domestic Generation									
Coal	538.00	3,569.01	44.21	538.00	3,211.26	34.50	660.00	3,389.57	31.36
Hydro power	979.70	2,711.14	33.58	1,329.70	4,511.44	48.47	1,329.70	4,626.12	42.80
Fuel Oil	271.98	259.39	3.21	271.98	179.79	1.93	271.98	425.47	3.94
Renewable Energy	64.77	56.53	0.70	64.77	42.52	0.46	163.77	73.33	0.68
Captive Generation by Industry and Licensees	25.16	37.61	0.47	3.31	8.63	0.09	2.70	7.71	0.07
Total Domestic Generation	**1,879.61**	**6,633.68**	**82.17**	**2,207.76**	**7,953.64**	**85.45**	**2,428.15**	**8,522.20**	**78.85**

Sources of Power in Cambodia-Imported

Power Sources	2017			2018			Plan for 2019		
	MW	GWh	%	MW	GWh	%	MW	GWh	%
2. Import Power Sources									
Thailand	135.50	290.93	3.60	135.50	262.65	2.82	135.50	664.82	6.15
Vietnam	277.00	1,094.66	13.56	277.00	1,027.15	11.04	277.00	1,549.01	14.33
Laos	30.00	53.56	0.66	30.00	64.00	0.69	30.00	71.68	0.66
Total Import	**442.50**	**1,439.15**	**17.83**	**442.50**	**1,353.80**	**14.55**	**442.50**	**2,285.51**	**21.15**
3. Total Power Sources	**2,322.11**	**8,072.84**	**100.00**	**2,650.26**	**9,307.44**	**100.00**	**2,870.65**	**10,807.71**	**100.00**
4. Increase over prev. year	**222.62**	**1,039.69**	**14.78**	**328.15**	**1,234.60**	**15.29**	**220.39**	**1,500.27**	**16.12**

Growth of Household Connection 2004-2018 in Million



Total Household (Millions)	2.57	2.60	2.67	2.80	2.83	2.94	2.94	3.04	3.08	3.12	3.16	3.18	3.28	3.38	3.52
# of Household's connection (Millions)	0.27	0.30	0.35	0.41	0.48	0.55	0.67	0.81	0.99	1.19	1.35	1.57	1.91	2.32	2.54
% of Household's connection	10.61	11.78	13.42	14.83	17.22	18.79	22.88	24.17	29.25	38.14	42.72	49.37	58.23	68.64	72.16

MAIN HYDROPOWER PLANTS AND THERMAL POWER PLANTS OPERATING IN CAMBODIA					
PROJECT	LOCATION	CAPACITY (MW)	COMPANY	COST (US$ MILLIONS)	YEAR OF OPERATION
Hydropower plants					
Kirirom I	Kirirom Plateau, Koh Kong	12	CETIC International Hydropower Development Co., Ltd	24	1965
Kamchay	Kamchay Plateau, Kampot District	194	Sinohydro Kamchay Hydroelectric Project Co., Ltd	280	2011
Kirirom III	Kirirom Plateau, Koh Kong	18	CETIC International Hydropower Development Co., Ltd	47	2013
Khum Osaom	Pursat Province	120	C.H.D (Cambodia) Hydropower Co., Ltd	255	2013
Stung Tatay dams and hydropower infrastructure	Koh Kong Province	246	China National Heavy Machinery Corporation	540	2014
Lower Russei Chrum power plant	Koh Kong Province	338	China Huadian Corporation	496	2015
Lower Sesan Dam 2	Steung Treng Province	400	China's Hydrolancang International Energy Co., Ltd	781	2018
Thermal power plants					
Suvannaphum power plant	Kean Svay District	10	Suvannaphum Investment Co., Ltd	N/A	2008
Sihanoukville CIIDG power station	Stueng Hav Industrial Zone	270	Cambodia International Investment Development Group	362	2010
Cambodian Energy Limited I power plant	Sihanoukville Province	150	Cambodian Energy Limited	170	2014
Cambodian Energy Limited II power plant	Sihanoukville Province	150	Cambodian Energy Limited	600	2019

Key Challenges

- Heavy dependence on imported fossil fuels and imported electricity, As Cambodia's power supply relies heavily on imported fuels, a new challenge is emerging due to the increases of international fuel prices
- low electrical grid coverage in rural areas and frequent electricity shortages and power outages.
- Despite considerable progress in expanding the capacity and coverage of electricity supply in recent years, electricity costs remain to be among the highest in the world, and electrification rate, one of the lowest in Asia due to initial investment costs

- While access to grid electricity has expanded in Cambodia to 71.5 percent, reliability of electricity supply can be improved, as nearly two-thirds of households with access face frequent power shortages. Nationwide, nearly 90 percent of Cambodian households have access to at least four hours of electricity a day.
- Some 30 percent of rural households rely on off-grid power for electricity, including solar home systems, solar lanterns, and rechargeable batteries. More than 66 percent of households still use biomass stoves, hence helping families – particularly low-income and female-headed households – gain access to clean fuels and stoves would reduce health risks.

Key Challenges

- The shifts toward hydro and coal in the power generation mix, away from expensive diesel-based generation, imply difficult challenges that are specific to each energy source.
  - The seasonality of hydro energy production—alternative sources of electricity must be secured during times of drought.
  - Despite the fact that coal resources are likewise plentiful in Cambodia, the negative impacts from the use of coal-fired generation both on the local and global environment will have to be mitigated. In this regard, cooperation with the developed members and lending institutions in terms of technology and financial support will have to be explored.