



独立行政法人 国際協力機構

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Country Report
On
energy SECTOR IN CAMBODIA

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Outline

☛ ★ Electricity STATUS in Cambodia

- ★ Energy Supply and Demand
- ★ Problem Statement
- ★ Conclusion



Electricity STATUS in Cambodia (1)

Background



Kingdom of Cambodia

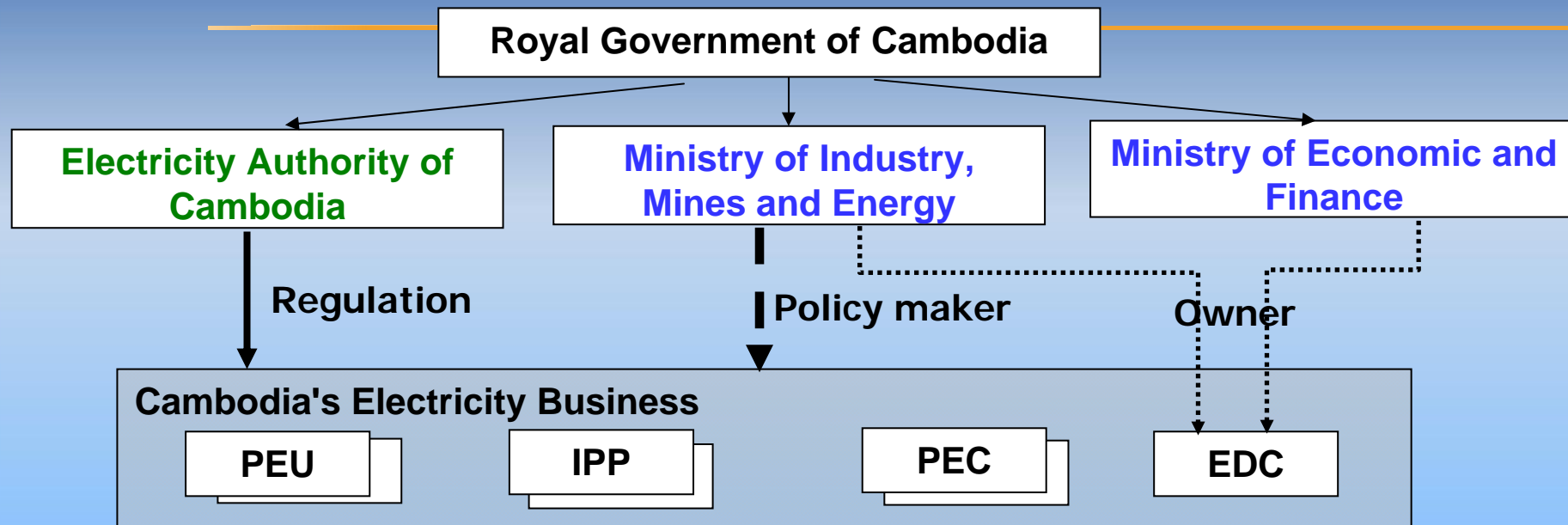


Electricity STATUS in Cambodia (2)

Background

Capital	Phnom Penh
Land Area	181,035 sq.km
Population	13,395,682 Million (2008), Male: 48.6%; Female: 51.4%
Official Language	Khmer
Currency	Riel (US\$1 = 4150 Riels)
Major Export Products	Garments/Textile Product, Sawn Wood Furniture and Rubber
Major Industries	Textiles and Garments, Beverage, Food Processing, Wood Processing
Head of State	His Majesty Samdech Preah Baromneath Norodom Sihamoni
Head of Government	His Excellency Samdech Hun Sen Prime Minister

Electricity STATUS in Cambodia (3)



.....→ Ownership of EDC

- - - → Policy; Planning; Development; Technical standard

————→ Tariff, license, Review the Planned Investments, finances and performance; Enforce the regulations, rules and standards

PEU: Provincial Electricity Utility

PEC: Provincial Electricity Company

EDC :Electricity Du Cambodge

IPP :Independent Power Product

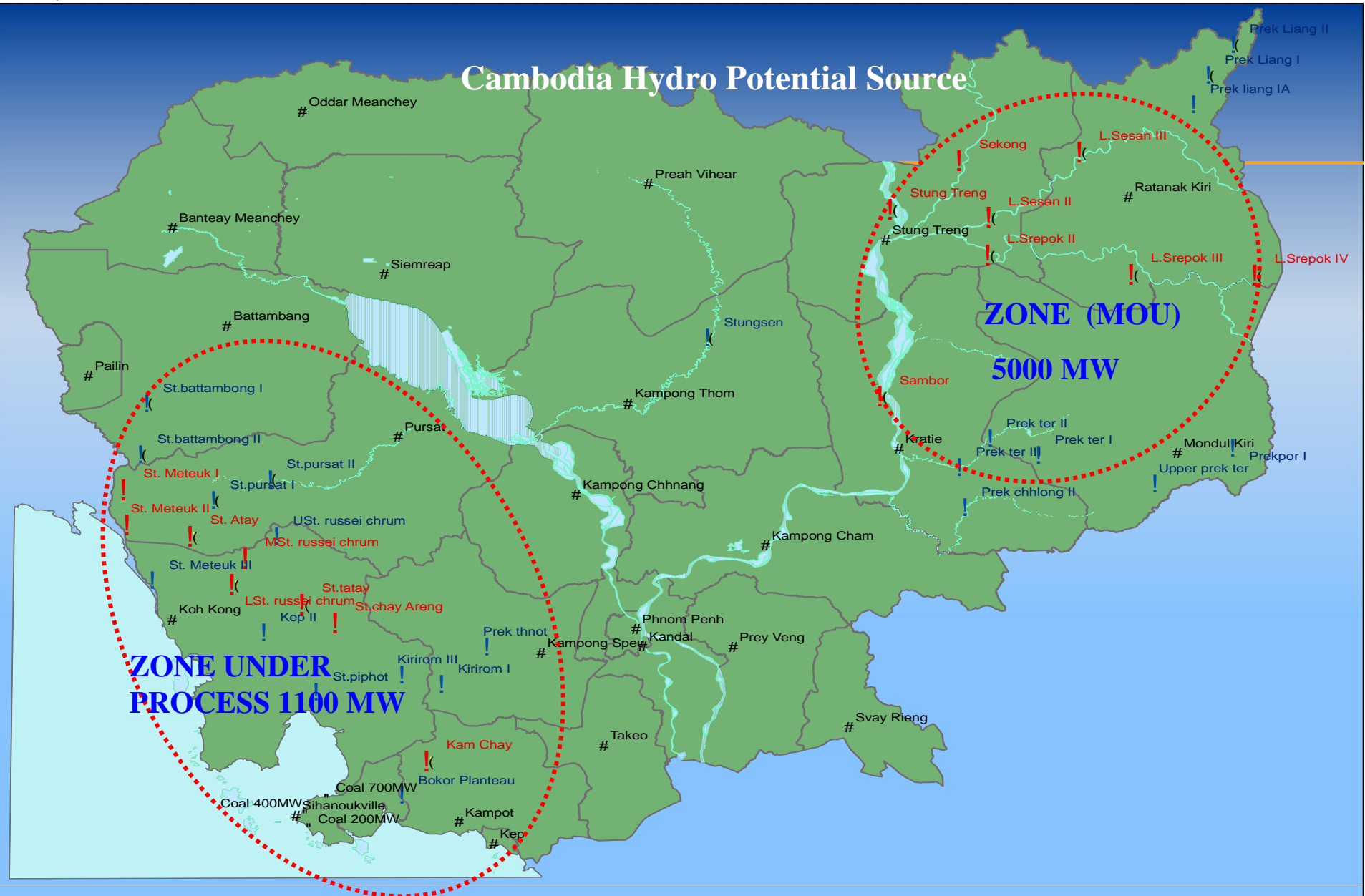
ORGANIZATION CHART OF POWER SERVICE

Electricity STATUS in Cambodia (4)

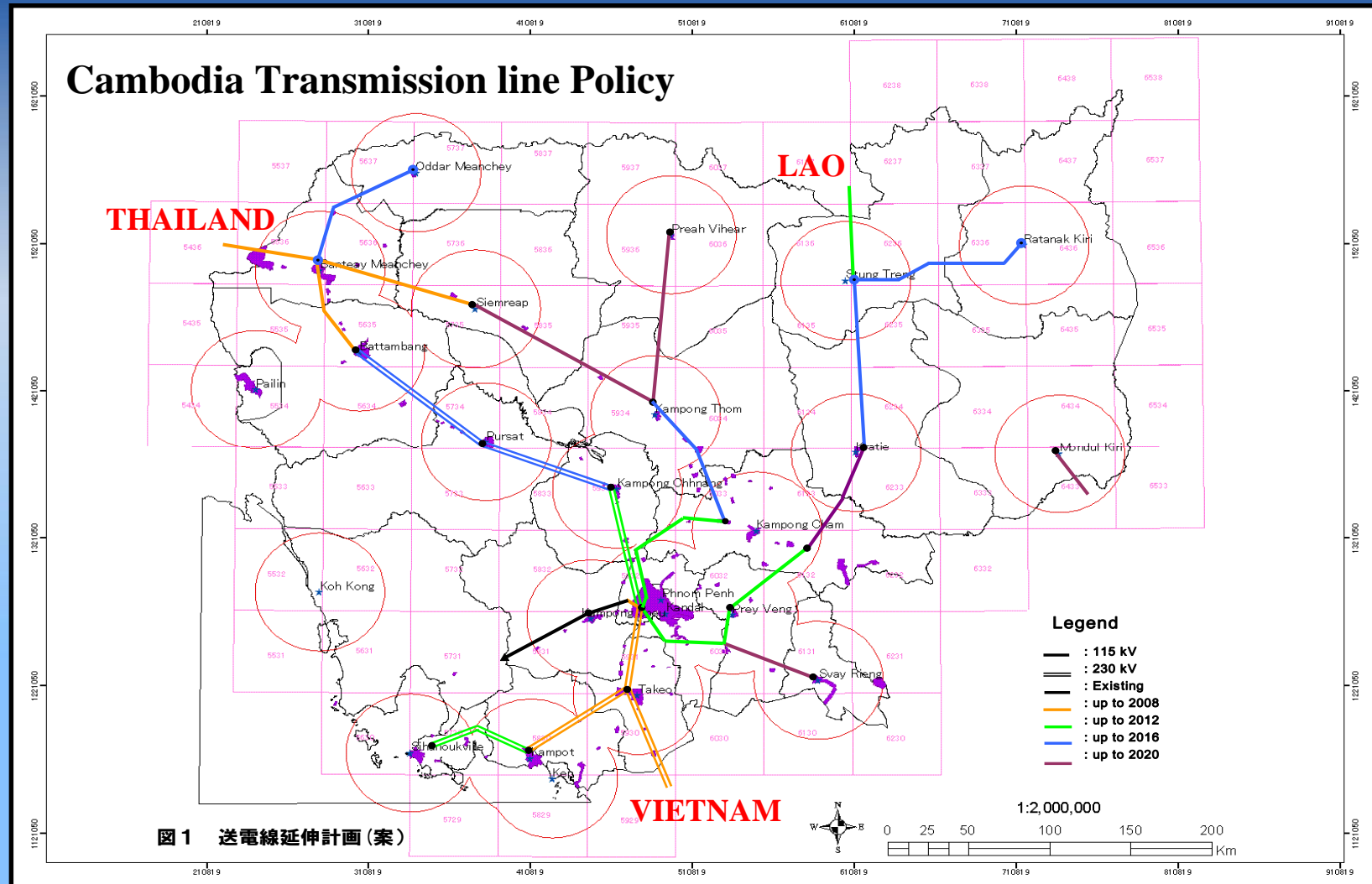
Cambodia Energy Policy

- To provide an adequate supply at reasonable and affordable price.
- To ensure a reliable and secured electricity supply of investments in Cambodia and developments of the national economy.
- To encourage exploration, environmentally and socially acceptable development of energy resources.
- To encourage the efficient use of energy and to minimize the detrimental environmental effects resulted from energy supply and consumption.

Cambodia Hydro Potential Source



**Map of Location of Hydro Potential: being constructed 1100 MW (26%),
MOU 5000 MW (73%), others left 3500 MW**



Map of Proposed Extension of National Grid

Expansion Power Source Development

No	Expansion of Power Source	Type	Size (MW)	Operation Year
1	Import from Laos	Import	20	2010
2	Import from Vietnam	Import	120	2010
3	Import from Thailand	Import	60	2010
4	Kamchay hydro generator	Hydro	193	2010
5	Kirirom III hydro generator	Hydro	18	2010
6	Coal Power Plant in Sihanouk Ville	Coal	200	2010
7	Stung Atay hydro generator	Hydro	120	2012
8	Coal Power Plant at Coastal Area	Coal	400	2013
9	Lower Russey Chrum hydro generator	Hydro	235	2014
10	Chay Araing hydro generator	Hydro	260	2015
11	Sambo hydro generator	Hydro	467	2016
12	Sesan & Lower Srepok II hydro generator	Hydro	420	2016
13	Stung Battambang I hydro generator	Hydro	24	2017
14	Upper Russey Chrum hydro generator	Hydro	32	2017

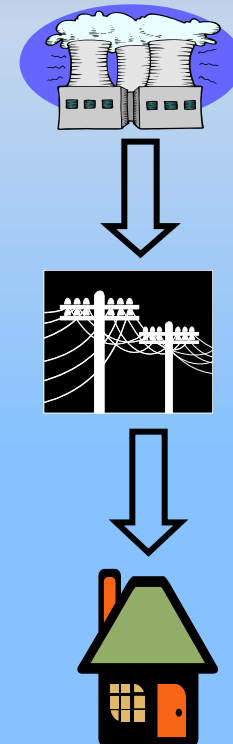
Outline

Electricity STATUS in Cambodia

☛ **Energy Supply and Demand**

Problem Statement

Conclusion

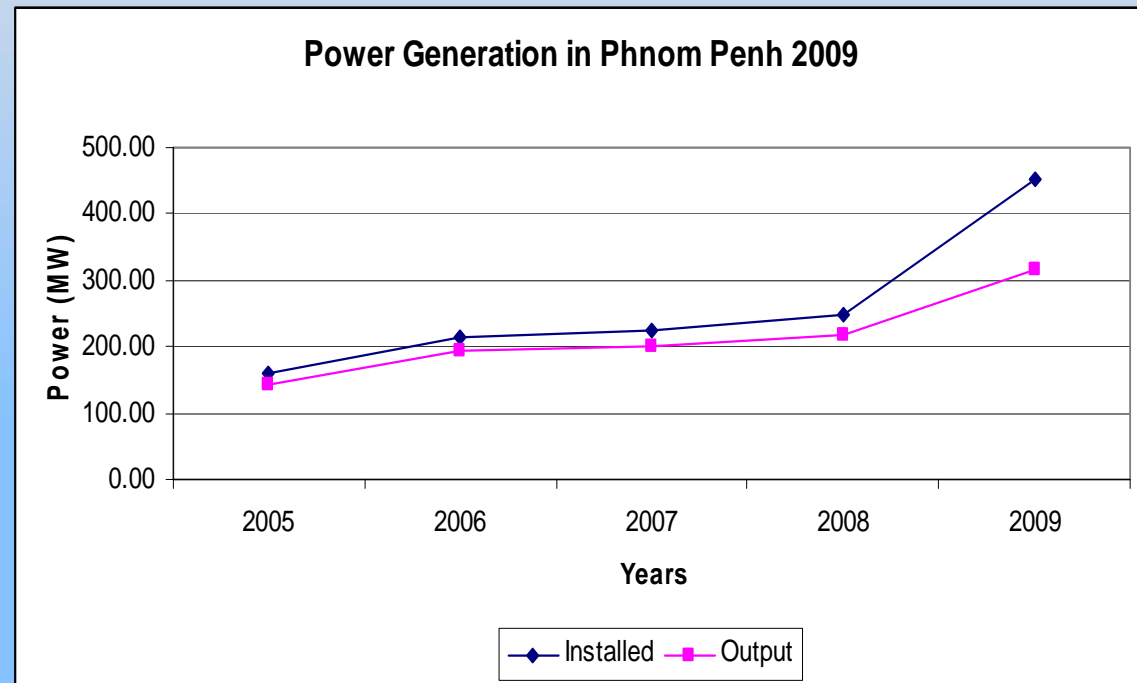


Energy Supply and Demand (1)

Power Generation for Phnom Penh in 2009

Unit : MW

Years	Installed	Output
2005	160.50	142.30
2006	214.78	192.40
2007	224.78	200.49
2008	247.28	217.49
2009	453.28	317.49

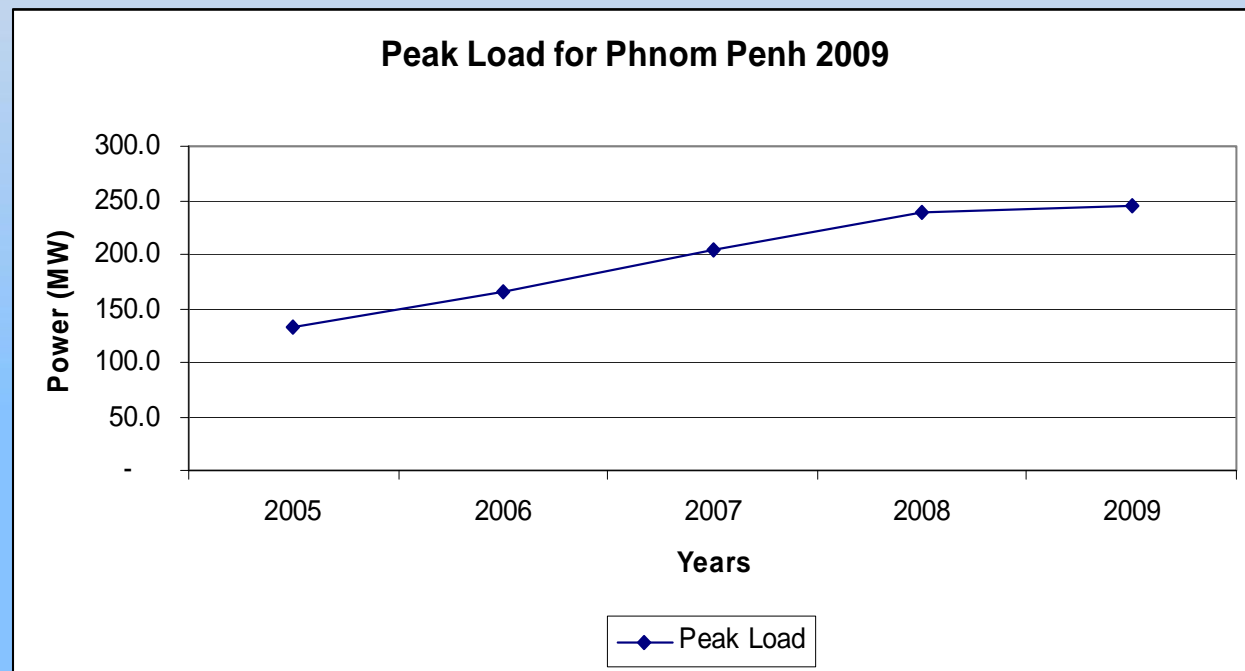


Energy Supply and Demand (2)

Peak Load Demand in 2009

Unit : MW

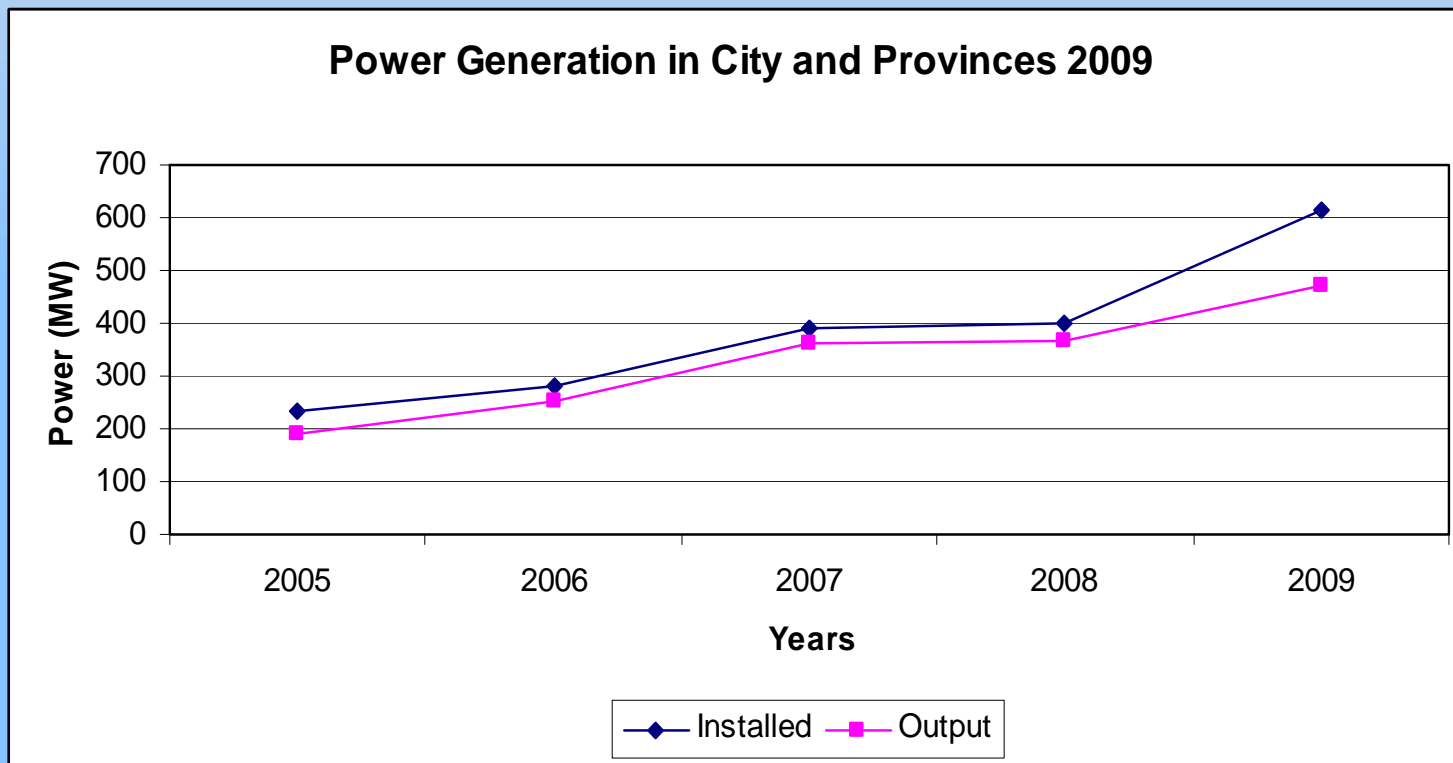
Yeas	Peak	Off Peak
2005	133.1	39.4
2006	165.0	52.2
2007	204.5	54.2
2008	239.0	66.2
2009	244.1	85.0



Energy Supply and Demand (3)

Power Generation for City and Provinces in 2009

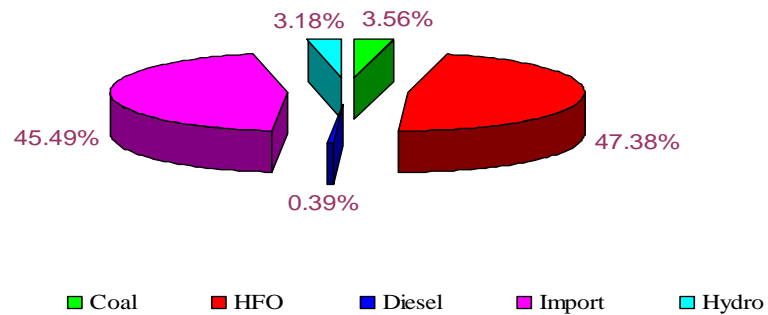
Facilities		2005	2006	2007	2008	2009
Phnom Penh and Provinces	Installed	233.45	278.92	390.66	401.52	616.32
	Output	192.47	250.16	359.85	367.55	473.75



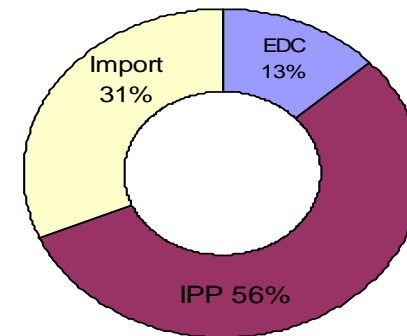
Energy Supply and Demand (4)

Type of Power Generation in 2009

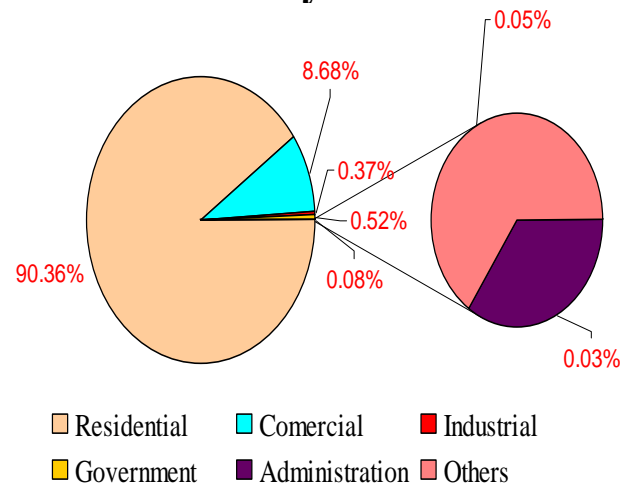
Source of Energy generation 2009



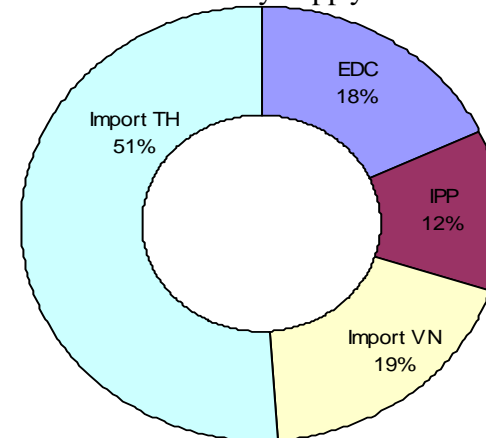
Available Electricity Supply in Phnom Penh 2009



Customers by Sector 2009



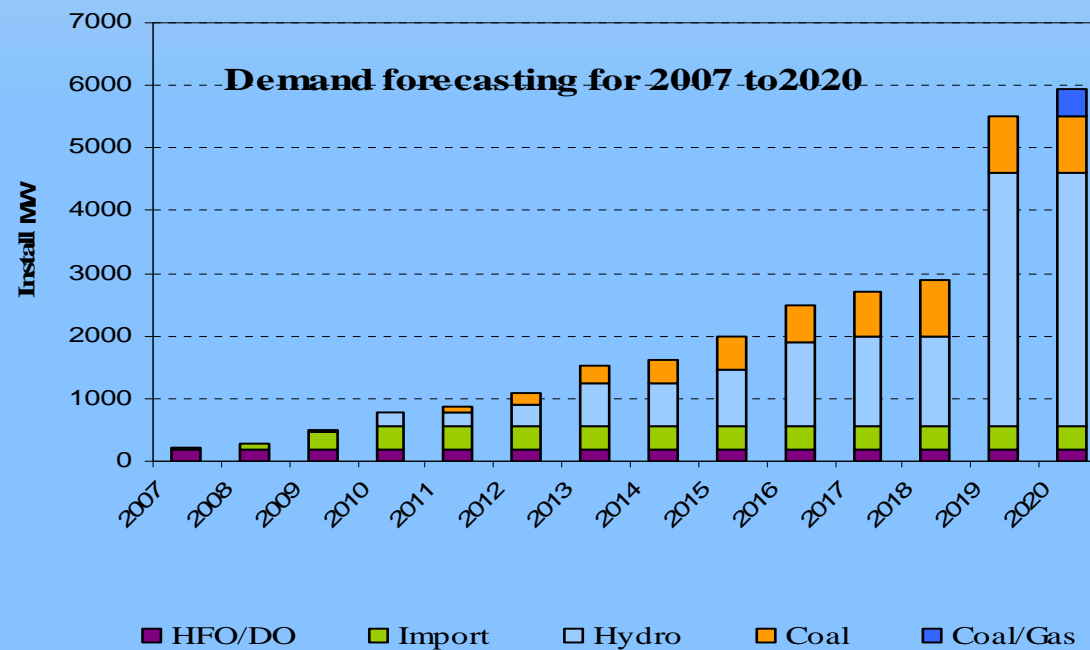
Available Electricity Supply in Provinces 2009



Energy Supply and Demand (5)

Electricity Demand forecasting

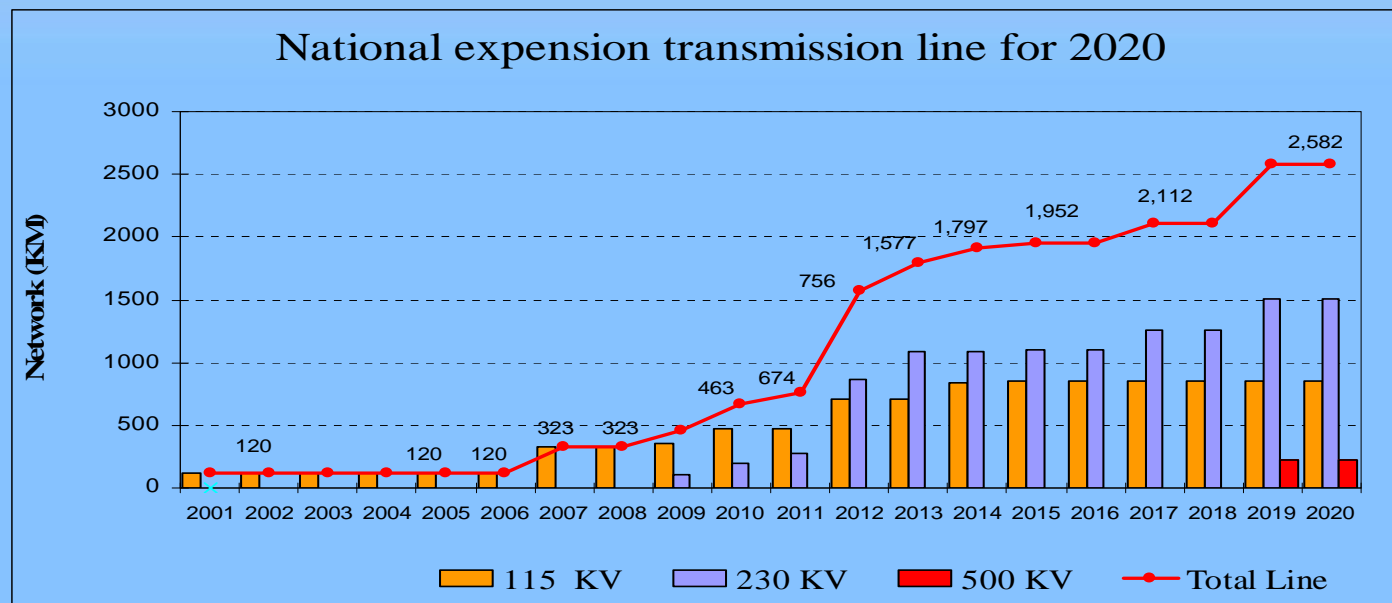
Power (MW)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
HFO/DO	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38	190.38
Import	0	80	280	360	360	360	360	360	360	360	360	360	360	360
Hydro	12	12	12	223	223	343	681	681	927	1347	1455	1455	4055	4055
Coal	0	0	0	0	100	200	300	400	500	600	700	900	900	900
Coal/Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	450
Total	202.38	282.38	482.38	773.38	873.38	1093.38	1531.38	1631.38	1977.38	2497.38	2705.38	2905.38	5505.38	5955.38



Energy Supply and Demand (6)

Forecasting of National expansion transmission line

Line	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
115 kV	120	120	120	120	120	120	323	323	353	477	477	713	713	833	853	853	853	853	853	853
230 kV	0	0	0	0	0	0	0	0	110	197	279	864	1084	1084	1099	1099	1259	1259	1509	1509
500 kV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	220
total	120	120	120	120	120	120	323	323	463	674	756	1577	1797	1917	1952	1952	2112	2112	2582	2582



Outline

Electricity STATUS in Cambodia

Energy Supply and Demand

☛ **Problem Statement**

Conclusion



Problem Statement

- ◆ Inefficiencies created by old generating equipment
- ◆ Uncompetitive market structures
- ◆ Inadequate legal frameworks
- ◆ Inadequate administrative capabilities
- ◆ Lack of access to electricity

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Conclusion (1)

Subjects and Reasons

Subjects	Reason
Energy Demand Forecasting	<ul style="list-style-type: none"> • Operation of electricity companies, energy-efficient, and reliable operation of power system. • The forecasting is an important for planning start up and shut down schedules and load management.
Energy Policy and Objective (Biomass, Solar, Coal...etc.)	<ul style="list-style-type: none"> • achieve rural electrification, providing electricity services 70% households by year 2030 and develop renewable energy.
Energy Storage (Batteries)	<ul style="list-style-type: none"> • Rural areas use battery for lighting at night time
Micro-Hydro power	<ul style="list-style-type: none"> • High potential of hydro power source

Conclusion (2)

Expectation for the Training Course

- ◆ Operation of electricity companies to reserve the generation system, energy-efficient, and reliable operation.
- ◆ Reliable and cost-effective electricity services to rural areas and equitable way is a major challenge.
- ◆ To make the policy effective all stakeholders.

ACKNOWLEDGEMENTS

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- ① Thank to the Royal Government of Cambodia and the Ministry of Industry, Mines and Energy to nominate me to attend the training course in Japan.**
- ② Thank to the Royal Government of Japan and the Japan International Cooperation Agency (JICA) to accept me to be a participant joining training course on Energy Policy.**

Thanks for paying attention!

ARE THERE ANY QUESTIONS ?

