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# Energy sector in Cambodia

A large pile of cut wooden sticks and branches is the central focus of the image, stacked in a field. In the background, there are several standing wooden posts, some with clothes hanging from them, and a line of trees under a clear sky. The scene suggests a rural setting where biomass is being prepared for use.

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# Cambodia – country profile



<b>Population (2009)</b>	<b>15 million</b>
<b>Per Capita GNI (2008)</b>	<b>US\$610</b>
<b>GDP growth rate (2009)</b>	<b>-2%</b>
<b>GDP compilation (2008)</b>	<b>Services 42%, Agriculture 35%, Industry 24%</b>
<b>Urban population (2008)</b>	<b>20%</b>
<b>Population living in poverty (2007)</b>	<b>30%</b>

Data sources: ADB / World Bank

# Energy situation in Cambodia

- Cambodia's infrastructure, including the power sector severely damaged during the war
- Agricultural society – 85% live in rural area
- Less than 15% of all households have electricity
- Rehabilitation process started with the help of World Bank, ADB and individual countries.

- Capital city Phnom Penh accounts for 70% of the country's electricity consumption
- Cambodia has some of the highest electricity prices in the world



Source: xxx

# Traditional energy sources

## Wood energy

- Fuel-wood has played a crucial role in meeting the energy needs and is likely to continue to be an important energy resource for many years
- Need to develop a better understanding of the environmental impacts and to develop policies on replacing from time to time the use of wood by other renewable energy sources.
- Also the efficiency of wood energy needs to be improved by using efficient stoves which reduce very significantly the consumption
- Recently, both woody and non -woody biomass is being utilized in wood and agro-industries for energy generation, by using modern bio-energy technologies for the production of landfill-gas, biogas, etc

## Coal

There has been indication of coal, but a proper inventory and feasibility study of coal deposits is needed.

*Source: xxx*

# Potential energy resources I

## Solar energy

- Average sunshine 6-9 hours per day, giving an average of 5kWh/day.
- Considerable potential of solar energy.
- Total installed capacity is around 3,000 kWp.

## Wind energy

- Southern part of the lake Tonle Sap, the mountainous districts in the southwest and the coastal regions, such as Sihanoukville, Kampot, Kep and Koh Kong have annual average wind speed of 5m/s or greater. Total area around 5%.

## Hydro

- Total estimated potential is 10.000MW, but current contribution to electricity production less than 20MW
- Currently two mini-hydropower plants are in operation

Source: xxx

# Potential energy resources II

## Biomass

A report prepared by NEDO identified significant biomass energy resources from a variety of agricultural residues such as rice husk., Cassia, Cassava, Luscenia, Mulberry, Coconut, SEM

## Biogas

- The effectiveness of small scale biogas has been demonstrated in Cambodia by a number of different projects.
- The use of animal wastes to generate high quality gas for cooking has significant economic, health, social and environment benefits for poor rural households.

## Biofuel

- Jatropha – 200 ha (Fencing), Palm Oil – 4,000 ha (recently) and can be 10, 000 ha and sugar cane 20,000 ha.

Source: xxx

# Key priorities and challenges (I)

## Improving and Commercialising Electricité du Cambodge's (EdC)

- Government-owned utility, serves the biggest cities, accounting for nearly 90% of total electricity consumption.
- Serves approximately 10 percent of the population, most of its customers are located in Phnom Penh.
- No national grid and towns are supplied through isolated systems
- Electricity tariffs in Cambodia are among the highest in the world



- Cambodia has made considerable progress in reforming the power sector, particularly in passing the Electricity Law in 2001 and establishing a regulator, the EAC.
- An immediate priority is to strengthen the new sector structure established under the Electricity Law and further commercialize its operations. Although EdC is a legally separate entity, it has been difficult for the Government to separate its own role as sector policy maker from its interests as one of EdC's largest customers, and to refrain from interference in EdC's operations.
- Opportunities may exist, however for private participation in EdC itself for a potential lease operator, concessionaire, or owner.

Source: The World Bank



# Key priorities and challenges (II)

## Improving Rural Electricity Access

*Many Cambodians in rural areas use kerosene for lighting, “three stone stoves” for cooking, and drink water from rivers or ponds. Wood and charcoal are the primary energy sources, and almost all electricity is generated from imported diesel. On average, rural families spend about 10 percent of their income on fuel and electricity.*

- Cambodia has one of the lowest electrification rates in Asia with less than 15% of its population connected to a power supply.
- Only about 6% of rural households have access to electricity supply, and another 3% own some type of individual power generating unit.
- Of the remaining 91% of the rural population, some 55% use automobile for occasional and limited use, or do without electricity completely (36%).
- Estimated 600 privately-owned Rural Electricity Enterprises (REEs) supply some 5 percent of the country's electricity consumption to 115,000 customers in rural areas and small towns.
- The Government's plan to increase rural electricity coverage to 70 percent by 2030 faces serious obstacles. EdC does not have the capacity or financial resources to extend its small grids into the countryside.

Source: The World Bank

# Key priorities and challenges (III)

## Reducing heavy reliance on biomass

- Up-to-date analysis of the use of biomass is scarce but the dominance of biomass energy in the energy balance is visible.
- Traditional fuels (wood, charcoal, and other biomass) accounted for 85% of the national energy supply balance based on the most recent available data (1994/95, FAO).
- Nearly 80% of this traditional fuel use was firewood and charcoal. Households consumed nearly all the firewood with some 90% of all firewood consumed in rural households and 8 percent by urban households.
- In 1994, the Government forecast that biomass energy would account for 80 percent of total energy demand in the year 2000 and 72 percent in 2010. According to the FAO, wood fuel production only fell 11 percent between 1995 and 2002.

*Source: The World Bank*

# Power sector strategy

- Investment in the power sector
- Interconnections with neighbouring countries and ASEAN Pow
- Priorities for power generation and transmission
- Establishment of the power sector's Regulatory Framework
- Commercialisation of EDC and state-owned corporations
- Private sector participation
- Provincial and rural electrification
- Raising rate access to reliable and good quality electricity services to 70% of rural households, by the year 2030
- 90% of villages electrified by the year 2030, a village being considered to be electrified when most community facilities and more than 50% of households have electricity.

*Source: The World Bank*

# Power sector strategy (cont.)

## **The government's strategy to reduce prices of rural electricity includes:**

- (a) extension of bulk power supply from EdC's grid to peri-urban areas, where economically viable;
- (b) support for the stabilization and strengthening of REEs, by improving their access to financing, increasing licensing of rural franchises by EAC (the regulator), and providing technical support; and
- (c) support for the development of lower cost generation sources, including mini hydro and other renewable energy sources.

## **The government's long term strategy to meet demand growth and to reduce the high costs of EdC's supply comprises...**

- the import of cheaper electric power from Vietnam and possibly Thailand through the development of cross-border transmission links
- conversion of selected IPP and EdC generating plants from diesel oil to less-expensive heavy oil, renegotiation of certain IPP power purchase agreements, and securing new IPP generation on better terms;
- reducing EdC's operating costs through competition in fuel procurement, introduction of modern load dispatching, improvement of maintenance efficiency, and reduction of staff costs and bad debts; retirement of EdC's inefficient plant, when reserve margins allow; and
- possible development of medium-sized hydropower generation starting with a 120MW plant at Kamchay.

*Source: The World Bank*

# Latest: Oil found in Cambodia

2007

*In January 2005, Chevron announced Cambodia's first significant petroleum discovery, stating that it had found oil in four exploration wells and gas in one well during a six-well program in an offshore area called block A. Appraisal work is ongoing to obtain a better estimate of how much oil and gas block A is likely to contain and their quality. (Petroleum Sector Briefing Note No. 1 – March 2007)*

2010

*CAMBODIA will begin pumping oil for the first time in December 2012 as it looks to tap the potential of its offshore reserves. Cambodia was feted as South-east Asia's next petro-state after oil was discovered there in 2005, but production stalled amid apparent wrangling between the government and US energy giant Chevron over revenue sharing. Prime Minister Hun Sen warned the oil company in April that he would terminate its contract if the offshore fields had not begun pumping by late 2012. The nation is sitting on an estimated hundreds of millions of barrels of crude and three times as much natural gas. But it remains unclear how much can actually be recovered, or if potential revenue would be used to benefit Cambodia. The premier has warned it was 'highly premature' to estimate how much oil the undersea reserves might hold. (www.straitstimes.com; July 2010)*

Source: The World Bank

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