

**U.S. Agency for International Development
Infrastructure Course, December 17 – 20, 2007
Decentralized Infrastructure Services – Group Exercise**

Instructions

Read the following case study. When you have completed the reading, break into groups of 4-5 people and discuss the questions below. Spend about 15-20 minutes answering the questions. Then, select a spokesperson to summarize your conclusions to the other groups at the end of this exercise.

Assignment

The new USAID Mission Strategic Plan for Cambodia calls for improved access to basic infrastructure, including energy, in the rural areas as a means of fostering local economic development. Your team has been requested by the Mission Director to develop a plan for supporting a 3-year, \$5 million rural electrification (RE) program. Due to the capital intensive nature of rural electrification, the MD has insisted you develop your plan in close concert with other donors.

1. Based on the information in the case study, what objective(s) does your group recommend be adopted for the Mission's RE program? What specific performance indicators would you select to assess whether or not the program objectives are being achieved?
2. Do you agree that the RE program should continue to make use of REEs for power generation? Distribution?
3. If it is determined that additional support to REEs is justified, does your team see policy dialogue as an important component to the Mission RE program?
4. If the Mission proposes to continue to support REEs, what mechanisms can USAID and the other donors use to help address the high costs of service?
5. Indicate the types of activities your team recommends be initiated under the Mission's RE program to achieve its objective. How will your program's activities address issues of sustainability?
6. What risks exist that would prevent USAID from meeting its objectives, even if all of its activities are carried out adequately?

Country Background

The Khmer Rouge (1975-1979) genocide broke Cambodia's social and religious underpinnings, and undermined this country's political and economic development, leaving a legacy of limited leadership and management capacity, weak institutions, poor human development indicators, and a government that is still more autocratic than democratic. The country only recently emerged from a lengthy period of conflict, civil war and invasion with civil peace restored in 1998. After this long period of war and political disruption, the Government has made impressive progress on the macroeconomic front; high inflation has been brought under control, the exchange rate stabilized and growth has been relatively strong – real GDP growth of 7.0% from 1994-2004 and estimated 6.0% for 2004-2007. This improvement began with the political security provided by a United Nations intervention that allowed the election and establishment of a coalition government in the 1990s, and continued with the introduction of market reforms and business activities to increase and foreign investment to begin flowing into the country. Nevertheless, progress is threatened by a breakdown of basic infrastructure, including the power supply, which was virtually destroyed during the internal conflict.

The Kingdom of Cambodia, with an area of 181,000 sq km and a population of around 14 million, is one of the poorest countries in the world: per capita gross domestic product (GDP) is US\$470 (2006 est.). Endemic corruption and weak protection of political rights are disenfranchising individuals and communities. Given the dominant position of the Cambodian People's Party (CPP), there is concentration of power in the executive branch, and disorganization and ruinous competition among opposition parties. Further, corruption, a lack of transparency, competition for land resources, inadequate legal and regulatory frameworks and an unreliable justice system deter the investment needed for diversification and job creation. An entrenched system of patronage, disparities in social status, and low public sector salaries allow for the diversion of resources from the national budget. This, in turn, affects the Government's investments in public services and public investment. It also skews the benefits of growth in favor of a small elite, while 36% of the population lives below the poverty line. The income gap is growing and can, if left unchecked, lead to instability.

The Kingdom's Poverty Reduction Strategy Paper (PRSP) for 2003-2005 lists the key development objectives as: maintaining macroeconomic stability, improving rural livelihoods, expanding job opportunities, improving capabilities (in health, education and nutrition), strengthening institutions and improving governance, reducing vulnerability (disaster management, land mine clearance, disabled) and strengthening social inclusion, promoting gender equity and priority focus on population (reproductive health, primary education, rural employment). The country relies on donors and foreign personnel to ensure many basic services. The World Bank's Country Assistance Strategy calls for assistance to build the foundations for sustainable development and poverty reduction, through: (a) rebuilding human capital to enhance institutional capacity and good governance, ultimately leading to better public services and increased economic activity; (b) building physical infrastructure, particularly roads, water supply, and electricity in rural and provincial areas to increase access to services and productive activities; (c) facilitating private sector development through policy work, constructive dialogue with the Government and the private sector, and direct support to business ventures; and (d) focusing all interventions as much as possible on rural areas where the majority of the poor, and indeed the majority of the population live. The U.S. Government's FY2009 Mission Strategic Plan calls for prioritized strategy goals as follows: build political will to improve governance and fight corruption; address health threats at their root, building systems for detection, prevention, and treatment and improving health and education standards; and support sustainable, private sector-led economic growth and development.

Infrastructure

Access to infrastructure in Cambodia is relatively poor compared to its neighbors and countries of similar income levels. Cambodia's low income, low population density, and history of conflict are reflected in the poor coverage, quality, and efficiency of much of its infrastructure. The services that exist are mainly concentrated in urban areas, and the substantial rural population suffers from lack of access to markets, unsafe and unreliable water supplies, and dependence on traditional biomass forms of energy or high-cost alternatives. Efforts to augment public capacity and financing through private provision has thus far yielded concessions that were awarded in an uncompetitive and nontransparent fashion, generally yielding high costs to consumers.

Power. Cambodia has one of the lowest electrification rates outside sub-Saharan Africa; it has no power transmission system and has developed no large generation capacity. Where electricity is available, firms and

individual consumers face some of the highest energy costs in the world. Electricité du Cambodge (EdC), the state-owned utility, operates 22 isolated systems, which serve Phnom Penh and the capital towns of the provinces. The private sector has also emerged as an important provider, through independent power producers (IPPs) providing generation to EdC; through small-scale provision in rural areas; and through auto-generation for individual domestic and business consumers. In addition, there is extensive self-provision. A recent survey found that 63% of large businesses and 39% overall own a generator.

Table 1. Cambodia’s Infrastructure Access/Coverage Indicators

	GDP per capita ¹	Roads (100 km/km ² surface area)	Electrical grid (% hh w/ connections)	Telephone lines/1,000 population ²	Improved sanitation facilities (% population w/ access)	Piped water network (% population with access)
Cambodia	317	5.9	10	19	17	30
Lao PDR	465	9.2	20	15	30	37
Thailand	2,853	12.3	87	222	96	84
Vietnam	390	7.1	51	53	47	77
Uganda	355	4.0	5	17	79	52
Tajikistan	420	9.6	--	36	90	60

¹ In constant 1995 US\$

² Includes both mobile and fixed line

Source: The World Bank

Water and Sanitation. Although over 90% of the population lives outside the capital, Phnom Penh is the only city with a municipal water system with significant coverage of its population (roughly 70%). There is little sewerage and no wastewater treatment in the country. Solid waste management consists of open dumping sites. Water supply coverage in other cities and towns is substantially lower, at approximately 13% of residents, while only about 23% of rural residents have access to safe water. The majority of the systems are publicly owned and operated, but 16 licenses have been awarded to private providers, offering treated, piped water delivery to parts of provincial and district communities. Water self-provision is even more common than power self-provision among Cambodian businesses (44% of respondents overall), but declines with firm size.

Telecommunications. Cambodia’s fixed line telecommunications network is a public monopoly covering little more than Phnom Penh. Four mobile companies offer services and internet access that are now available in the capital and even in some provincial towns. In addition, two private companies operate international gateway services in a joint venture arrangement with the Ministry of Post and Telecommunications (MPTC). Mobile services are used for basic telephony because the quality of the fixed network is so poor and coverage so low. However, the combined fixed and mobile penetration rates is currently only around 1.91 per 100 inhabitants (0.25 for fixed; 1.66 for mobile telephony), which is low by both regional and international standards. Cambodia has both high telecom charges relative to other countries in the region, although they have come down in recent years. Residential connection rates, for example, are almost five times those for Malaysia and about double those for Lao PDR. Business monthly subscription tariffs are seven times those of Lao PDR, almost four times those of Thailand and Vietnam. As with the energy sector, Cambodia has failed to reap all the benefits of competition and private involvement in service provision in the telecommunications sector because each private license or cooperation agreement has been promulgated in a nontransparent manner that does not encourage competition.

Transport. Despite substantial government and donor investment in transport from the early 1990s, the network elements of the sector – roads, rail, and waterways – still struggle with insufficient maintenance, degradation from floods, and lack of investment funds, all in the face of increasing demand. Cambodia has the least developed road network in the region with the smallest percentage of paved roads. Cambodia’s railroad is single-line, slow (average speed of only about 15 km/hr), and inefficient (subject to regular delays and cancellations). The country’s rail infrastructure and rolling stock capacity is considerably smaller than that of all its neighbors, the network remains unconnected to Thailand, and its efficiency is extremely poor. Cambodia’s one deep-sea port at Sihanoukville is an inefficient public monopoly, used mainly for general cargo and container traffic, and is the primary channel for imports and exports, handling approximately 70% (by weight) of all cargo in and out of the country. It is also one of the most expensive in the region when unofficial charges for container handling, CamControl, customs, policing, etc. are included.

Power Sector Development and Rural Electrification

In 2002, power generation by EdC accounted for 32%, with IPPs (engaged in early 1994 to revive supplies) providing 63% and the Kirirom Hydro Plant the remaining 5%. The dependable total system capacity in 2003 was 109 MW. Despite the creation of substantial IPP generating capacity and EdC's commendable efforts to reduce system losses to 13.5%, the quality and reliability of supply to Phnom Penh continue to be poor, and generation reserve margins remain well below norms. Consequently, many large consumers operate high cost captive diesel-powered generators and the national electricity network remains disintegrated, precluding capture of economies of scale. With demand from EdC's grid expected to grow at a rate of about 13% per year from 2003 to 2008, EdC must look for major new sources of power supply.

Government's long term strategy to meet demand growth includes the development of a National Transmission System, the construction of a 120 MW hydropower plant at Kamchay, and interconnections with neighboring countries, especially Vietnam and Thailand, in coordination with the development of the Greater Mekong Sub-Region (GMS) grid. In the near to medium term, EdC and the Government plan to engage new IPPs and import power from Vietnam through a 220 kV link, whose establishment would later facilitate retirement of EdC's largely inefficient and costly generation.

Electricity Costs. Because there is no national grid and towns are supplied through isolated systems, electricity costs to Cambodian consumers are very high by international standards, ranging from about US¢14/kWh in EdC's grid to about US¢30-92/kWh in the rural areas served by Rural Electricity Enterprises (REEs). Costs of urban supplies are high because the disaggregated generation facilities of both EdC and IPPs are small capacity, low efficiency, high fuel cost diesel plants. In addition, earlier IPP contracts provided for high risk premiums. Rural supplies are expensive as they reflect costs posed by: (a) very small diesel generators, using diesel oil transported over long distances; (b) small loads with demands peaking at certain hours (due again to high prices); (c) low technical levels and high losses of the networks; (d) high risks borne by operators due to lack of regulation and clear franchising arrangements; and (e) limited access to capital for investments to improve efficiency or capture economies of scale.

Government's strategy to reduce the high costs of EdC's supply comprises: (a) the import of electric power from Vietnam, and possibly other neighbors; (b) conversion of selected IPP and EdC generating plant from diesel oil to less-expensive heavy distillate oil; (c) renegotiation of certain IPP power purchase agreements, and securing new IPP generation on better terms; (d) reducing EdC's operating costs through - competition in fuel procurement, introduction of modern load dispatching, improving maintenance efficiency, reducing staff costs, and reducing bad debts; (e) retirement of EdC's inefficient plant, when reserve margins allow; and (f) possible development of medium-sized hydropower generation.

Sector Reforms. Major steps undertaken by the Government to reform the power sector include: (a) the conversion in 1996, by a Royal Decree, of EdC into a limited liability company, owned jointly by the Ministries of Industry, Mines and Energy (MIME) and Economy and Finance (MEF); (b) developing and passing in February 2001 Cambodia's new Electricity Law; and (c) establishment in 2002 of the Electricity Authority of Cambodia (EAC), an independent regulatory body to license operating entities and establish electricity prices. The passage of the Electricity Law and the subsequent implementation steps have set the power sector on a path of reform that would lead to a largely unbundled sector with substantial private participation in generation and distribution of electricity. The main reform issue is to strengthen the new sector structure established under the Electricity Law, and further commercialize EdC's operations.

Although EdC is a legally separate entity, it has been difficult for the Government to separate its own role as sector policy maker (as EdC's owner), from its interests as one of EdC's largest customers, and to refrain from interference in EdC's operations. Lines between EdC's finances and the government budget remain blurred. EdC has been plagued since inception by financial problems, arising from its inability to pass on to consumers increases in the cost of power, and from high arrears in bill payment by government entities. EdC also needs to transform to a true company, and focus its attention on core businesses in transmission, system dispatch, and urban distribution, with a declining role in generation.

EAC has already begun to make an impact on sector operations. It has issued over 50 licenses to power generators and REE distributors. EAC has developed standard power purchase agreements (PPAs) and licensing guidelines and policies, specifically for small REEs, and is currently developing pricing methodologies.

Rural Electrification. Rural electrification (RE) is relevant to the vast majority of Cambodia's population and land areas. In the provincial towns, EdC and or local entrepreneurs supply power to the town center. Outside of these areas, power supply is rare and meager. Only about 6% of Cambodia's rural households have access to electricity supply, and another 3% have some type of individual power generating unit. The remaining 91% of the rural population either use automobile batteries (costing US\$2-3.5/kWh) for occasional and limited use, or do without electricity completely. In small communities throughout the country, electric power is supplied from small isolated systems and generators, covering about 100,000 households or about 5-10% of the population. These mini-networks developed informally by local entrepreneurs are very small (about 200 kVA), and technically low grade.

The Government's plan to increase rural electricity coverage from about 10% today to 70% by 2030, faces serious obstacles. **EdC does not have the capacity or financial resources to extend its small grids into the countryside. Furthermore, the World Bank and Government have concluded that it is uneconomical to stretch its network to vast remote areas which can be more economically served by decentralized grids.**

The existing roughly 600 REEs provide a possible private-sector-led framework for developing local systems. To make significant contributions to Cambodia's RE goals, however, the REEs must significantly expand their scale of operations and reduce costs and prices, all of which are interrelated. But, many REEs are having difficulty doing so. Among the challenges REEs face include: (a) legitimacy, through licensing, to be able to solidify and formalize their businesses, coupled with a clear framework of technical standards and pricing guidelines within which all players have a common understanding of expectations; (b) improved access to financing, beyond the current limited resources of the entrepreneurs' private equity; and (c) greater access to technical and managerial know how.

REEs. It is estimated that between 600 and 1,000 small private power systems are operating in Cambodia, serving about half a million customers or nearly as many households as the national power company. Most of these entrepreneurs, or REEs, set up their businesses prior to the formation of the interim government in the mid-1990s and continue to provide service to communities who otherwise would have no network connections whatsoever. In their totality, these small independent companies have about half of the country's generating capacity. The majority meter their customers and charge either a flat rate or a single block decreasing tariff. They average 200 households per business. In recognition of their importance, the Government's Rural Electrification Strategy envisions the convergence of these REEs into local distribution companies as transmission is rolled out across the country.

REE's face problems of low quality, low connections and high tariffs. Though at present REEs are operating commercially, their very high tariffs (average of US¢ 51/kWh) severely constrain access to rural consumers, particularly the poor. Lack of adequate technical capacity and use of sub-standard equipment also results in poor service standards. There are no incentives for growth of REE businesses and economies-of-scale in service delivery are not being achieved—they remain small and scattered. A survey carried out by Enterprise Development of Cambodia in January 2001 identified several factors that limit the ability of the REEs including: (i) a low level of business management and technical skills; (ii) extremely limited access to reasonable priced financing alternatives; (iii) lack of focus as to what constitutes "best practice"; and (iv) lack of valuable synergies that occur through interaction with similar and other businesses in industry sector groups or organizations.

References

- "Phnom Penh Power Rehabilitation Project," World Bank Staff Appraisal Report, Report No. 14378-KH, September 5, 1995.
- "Rural Electrification and Transmission Project," World Bank Project Appraisal Document, Report No. 27015-KH, November 21, 2003.
- "Seizing the Global Opportunity: Investment Climate Assessment and Reform Strategy for Cambodia." The World Bank, Report No. 27925-KH, August 12, 2004.
- "U.S. Mission to Cambodia," United States Mission Strategic Plan FY2009, May 31, 2007.
- "National Poverty Reduction Strategy 2003-2005," Kingdom of Cambodia, December 20, 2002.
- "The Private Sector's Role in the Provision of Infrastructure in Post-Conflict Countries: Patterns and Policy Options," Social Development Papers on Conflict Prevention & Construction, Paper No. 16, The World Bank, August 2004.