I. Country and Sector Background

With a population of approximately 14 million and a gross national income of about US$380 per annum, Cambodia is one of the poorest countries in the region, having about 36% of its population living below the poverty line. National per capita electricity consumption is about 63 kWh per annum, electricity access rate is less than 18%, while electricity tariffs (grid-based tariff in the range of 16-23 USc/kWh, and tariffs in the rural area in the range of 30-90 USc/kWh) are among the highest in the world.

The low reliability of the electricity system and geographical limitations of a national interconnected grid have forced many enterprises and large individual consumers to install captive power plants. Private Independent Power Producers (IPPs) were engaged in early 1994 to revive power supplies. The dependable total system capacity in 2005 was 226 MW. Power facilities exist only in the municipalities and provincial capital cities. All the facilities installed in the cities are extremely small scale (except for Phnom Penh), isolated and independently operated.

The insufficiency of the power supply system, dependency on oil based generation and the lack of a national grid distribution system are considered serious problems. Generating costs and tariffs are extremely high compared to other countries. As Cambodia’s power supply relies heavily on imported fuels, a new challenge is emerging due to rapidly accelerating international fuel prices. The high costs and power supply shortages pose severe constraints to industrial growth.

Faced with rising international oil prices, the Government is exploring new sources of energy, including, hydropower, offshore and onshore oil and gas, renewable energy and importing form neighboring countries. With a very small, even though growing market, and the absence of a
national grid, Cambodia does not have the opportunities of benefitting from economies of scale in developing its energy resources in the near term. It has therefore, quite appropriately, decided to adopt a regionally focused energy strategy through interconnection with neighboring countries.

II. Objective

The project development objectives are:
- Provide sustainable and reliable electricity at affordable prices to consumers in Phnom Penh and along the transmission corridor by importing power from Vietnam.
- Reduce global emissions of carbon dioxide.

The objectives of this Project are therefore consistent with the developmental and poverty reduction objectives of the Royal Government of Cambodia.

III. Rationale for Bank involvement

The World Bank has been a pioneer in the carbon market under the Kyoto Protocol, helping to develop policy, regulatory, fiscal, and financial instruments across sectors and countries to generate incentives to reduce GHGs. Over the past decade, the World Bank has managed 12 Carbon Funds including the CDCF established in 2003. These Carbon Funds do not finance projects, but contract to purchase CERs in a commercial transaction, with annual or periodic payments following verification by a third party auditor. These transactions have provided an additional revenue stream to reduce financial risks and to leverage new private and public investment into projects that reduce GHG emissions.

Support for client countries to address the objectives of international environmental conventions such as the Kyoto Protocol is an identified priority in the World Bank’s Environment Strategy and was reaffirmed in the 2005 Environment Strategy for the East Asia and Pacific Region (EAP).

The Project is consistent with the Cambodia Country Assistance Strategy objectives through its support for electricity infrastructure development for both urban and rural economic growth, and its emphasis on improving the operational and managerial efficiency of the power sector and promoting its commercialization and privatization.

The CERs will provide not only a revenue stream, but a market-based incentive to EDC to support and improve the electricity supply in Cambodia. The CDCF also requires the development of Community Benefit Plan (CBP) that promotes the World Bank’s mission of reducing poverty as well as encouraging economically and socially sustainable development.

The World Bank as a trustee of various Carbon Funds has undertaken a pioneering role in developing the CDM market in Cambodia, including awareness raising, capacity building and an emerging portfolio of CDM projects. The World Bank has played a key role in the development of other programs that seek to improve the quality and increase the access to reliable sources of electricity in Cambodia. The CERs will help facilitate the transfer of technology and capacity
building to operate new systems and provide an example for others to take advantage of the financial incentives from the sale of CERs to implement power sector system projects.

IV. Description

The Project consists of the sale of the first 180,000 tons of CO2 equivalent emissions reductions (ERs) over the period of six years to the World Bank-managed Community Development Carbon Fund resulting from Cambodia’s importation of lower “Carbon-emitting” electricity generation from Vietnam, compared to the higher “Carbon-emitting” electricity generation from diesel-fueled plants in Phnom Penh, Cambodia (the Base Line Scenario).

The Project comprises the introduction of a 220kV interconnection between Vietnam and Cambodia that would facilitate import of significant amounts of electricity (up to 200MW capacity, 1,500 GWh per annum) from Vietnam - generated by larger, more efficient, and in aggregate lower emission factor (tCO2e/kWh) sources, comprising a mix of hydro, gas-fuelled and coal-fired generation plants.

Power generation and supply in EDC is primarily based on diesel fired generators, owned by EDC or by IPPs. As Cambodia has limited access to renewable (e.g., hydro) or other fossil fuels (e.g., coal or natural gas) and poor financial status, expansion of power generation capacity would most likely depend upon new diesel/heavy fuel oil generators through IPP mode. Therefore, the most likely baseline scenario for EDC to meet the power demand growth of Phnom Penh is by smaller, less efficient, higher emission factor sources, comprising diesel/heavy fuel oil (HFO) - fired diesel-engine and steam-turbine driven generators. The transmission line will reduce EDC’s dependence on these systems and allow the carbon intensive Cambodian system access to a cleaner Vietnamese power system.

As a result of importing “cleaner” power from Vietnam, the Project will generate emission reductions by displacing the business-as-usual scenario of diesel/heavy fuel oil based electricity generation in Cambodia.

This Project falls under the large-scale clean development mechanism (CDM) project activity category and applies the proposed new methodology developed by the World Bank Carbon Finance Unit: “Reduction of emissions through one way export of power from lower to higher emissions factor electricity system”.

Monitoring and evaluation will be undertaken through the specific monitoring plan for Verification of Emissions Reductions that will be developed in the CDM Project Design Document. EDC is the project sponsor and will be accountable for overall reporting on implementation progress, preparation of financial monitoring reports, and preparation of audited project accounts.
V. Financing

Source: ($m.)

Government Counterpart Funds 23.70
World Bank (IDA Credit No. 3840-KH) 16.00
ADB (Loan 2252-CAM) 44.30
Nordic Development Bank (Credit No. 425) 11.00

Total 95.00

VI. Implementation

EDC will assume overall management of the Rural Electrification and Transmission Project (RETP) – 220 kV Interconnection between Cambodia and Vietnam and will be responsible for operations and maintenance and for all CDM related tasks to ensure that CERs are monitored and accounted for.

Monitoring and evaluation of the CDM Project will be undertaken through the specific plan for Verification of Emissions Reductions that will be developed in the CDM Project Design Document (PDD) and the World Bank Carbon Finance Unit’s Operations Monitoring Plan.

VII. Sustainability

The physical benefits of the project will sustain power trade to be supported by the proposed interconnection as the project is mutually beneficial for Cambodia and Vietnam and meets critical supply deficits in Cambodia.

EDC and EVN are already engaged in some cross-border power exchange, carried out on the basis of ad-hoc commercial arrangements, which is growing rapidly with cross-border investment in generation. Several agreements between GMS countries have been signed to import/export power between Cambodia, Thailand, Laos and Vietnam. Feasibility studies are being conducted for medium voltage interconnection between Thailand and Cambodia, and southern interconnection between Thailand-Laos-Cambodia to enable implementation of the WB-financed GMS Power Trade project over the next decade.

The high political visibility of regional economic and electricity grid integration, rapid demand growth, exigency of power supply, growing concerns for the environmental agenda and energy security, and strong political support to a regional power trade will contribute to the sustainability of the project. Support to regional projects, establishment and smooth functioning of regional institutions for implementation, active participation of senior representatives of governments and utilities in the deliberations lends support to a sustainable framework.
VIII. Lessons Learned from past experiences in the country/sector

This project is built on previous World Bank experiences in the energy sector including other cross-border interconnection carbon finance projects under preparation. The World Bank also developed a new CDM methodology for this project that was based on an in depth review of several baseline methodological options for cross-border power trade projects. Project preparation has also benefited from the experience and consultation with other World Bank task teams developing energy sector projects in the East Asia and Pacific and other Regions.

IX. Safeguard Policies (including public consultation)

The transmission line, which covers construction of a 109 km long double circuit 220kV line from the border with Vietnam to Phnom Penh and two associated substations is co-financed by the ADB (Loan 2252-CAM) Greater Mekong Subregion (GMS) Transmission Project and the Nordic Development Bank (Credit No. 425). The (i) reinforcement of the 115kV grid around Phnom Penh involving about 20 km of 115kV lines; (ii) modifications to three 115kV substations and 22kV extension; and (iii) a National Control Center to optimize load dispatch operations in the EDC system and increase system security is funded by the IDA credit (PO64844) Rural Electrification and Transmission Interconnection Project.

As the development and implementation of the Project is within an approved ADB, NDF and IDA project boundary that has already been previously appraised by ADB, NDF and the World Bank and is now under supervision, the environmental and social due diligence carried out, including the monitoring and supervision of the Environmental Monitoring Plan (EMP) and Resettlement Action Plan (RAP), satisfactorily addresses all safeguards issues and no new issues are raised by this Project.

EDC is the implementing agent and is responsible for overall management of the ADB, NDF, IDA and Carbon Offset Project – 220 kV Interconnection between Cambodia and Vietnam. EDC will also be responsible for operation and maintenance of all CDM related tasks to ensure that CERs are monitored and accounted for and for compliance with all environmental and social safeguards.

IDA has intensively supervised RETP; and ADB has done the same for its companion GMS Transmission Project. There has been exceptionally close coordination between IDA and ADB and NDF missions, especially in regard to supervision of the (overlapping) Environmental and Social safeguards issues of the two projects. The EMPs for the transmission lines and substations are an integral part of the supply and installation contracts for both the IDA, ADB and NDF projects and come under the management of EDC. The RAP is common to both projects and also comes under the management of EDC. Implementation activities for the EMP and RAP have commenced for the ADB project for which the supply and installation contractor is on board. The contracts for the 115kV transmission system reinforcement and modifications of the 115kV substations have been signed in December 2007 and work on this IDA component is underway. Currently, IDA, ADB and NDF see no insurmountable issues in the implementation of the EMP and the RAP. EDC has prepared a brief report and covering letter on the current status of environmental and social safeguards for the Project.
On the Vietnamese side, the 220kV supply system has been financed from savings of an existing IDA credit to Vietnam under the Transmission, Distribution and Disaster Reconstruction Project (Credit 3034-VN). The implementation of this system which has been completed has followed IDA’s OP 4.12, which among other safeguards, includes a RAP approved by IDA.

As the importation of power from Vietnam will feed the growing demand for power in Phnom Penh and surrounding areas and will not displace existing power plants of EDC and IPPs (running on either LDO or HFO), there will be no disposal of equipment. Consequently it involves no Environmental and Social safeguards issues beyond those that have already been identified in the original Integrated Safeguards Data Sheet (ISDS).

The additional funds that the CDCF pays for implementation of a Community Benefits Plan will provide income generating activities for village households by providing grid-quality electricity connections. The Plan, with a budget of approximately US$50,000 per annum, will be implemented by EDC, and no significant environment and social impacts or any major land acquisition result from implementing the Plan.

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X. List of Factual Technical Documents

- Project Idea Note (PIN)
- Project Design Document (PDD)
- New CDM Methodology “Reduction of emissions through one way export of power from lower to higher emissions factor electricity system”
- Power Development Master Plan for Cambodia
- Cambodia RETP Project Appraisal Document (PAD)
- Community Benefits Plan (CBP)
- Integrated Safeguards Data Sheet (ISDS)

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas
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