

## **12. Overall Assessment and Recommendation**

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### **12.1. Overall Assessment**

- (1) The Sihanoukville power plant is recommended to commence on 2006 for Stage 1 of 90 MW and 2008 for Stage 2 of another 90 MW. However, possible commencement time will depend on the schedule of transmission line between Kampot and Sihanoukville and also depend on the time natural gas becomes available.
- (2) The most preferable plant type is natural gas fired gas turbine combined cycle plant.
- (3) The optimum plant site is Option-4, which is located about 9 km away from the urban area of Sihanoukville City in north-northeast direction and just near So-kimex Oil Terminal.
- (4) The fuels used in the plant are natural gas as main and diesel oil for back up. Supply source of natural gas is still under studying on several options, but the most preferable option may be development in Cambodia territory.
- (5) The power plant is preferably use natural gas from the start of the operation. The target price of natural gas is around 4.0 \$/MMBTU (LHV Base, tax free) to keep the levelised power production cost of less than 6 ¢/kWh.
- (6) The levelised production cost is estimated to remain 7.8 ¢/kWh in the financial analysis even though the natural gas (4 \$/MMBTU) is put into the operation from the commencement. The production costs of natural gas combined cycle power plants in Southeast Asia are said to be 4.0 ~ 5.0 ¢/kWh. The above 7.8 ¢/ kWh seems to be still expensive in comparison with those in Southeast Asia.  
The reasons why the production cost of the project becomes rather expensive may be explained by the following circumstances, which the power sector in Cambodia encounters.
  - (a) The natural gas price is envisaged to be relatively costly in comparison with

the world market prices due to the inefficiency of the gas fields and un-development of natural gas demand in Cambodia.

- (b) MIME and EDC plan the implementation of hydropower plants in future. Due to the introduction of hydropower plants in future, the project has to be operated not as a base load power plant but as a load adjustment power plant.
  - (c) The plant cost has to become rather costly due to the small output capacity and small unit capacity of the plant because of the constraint resulting from the small power system in Cambodia.
- (7) With the project design, the environmental management plan and the environmental monitoring plan (as set forth in this report and in the EIA Report), environmental impacts can be mitigated to ensure project compliance with applicable environmental standards and guidelines of Cambodia and major lending institutions.

## **12.2. Recommendation**

- (1) The feasibility study of transmission line between Kampot and Sihanoukville should be commenced as soon as possible.
- (2) For accelerating the development of natural gas, MIME and EDC should actively participate in the process of development and negotiation with gas developer, and be recommended to indicate the concrete demand forecast of natural gas in Cambodia.
- (3) The power development plan should be made considering optimum balance of hydropower plant and thermal power plant. Installation of additional power plant using natural gas would encourage the development of natural gas.