

TERMS OF REFERENCE FOR PROJECT IMPLEMENTATION CONSULTANTS

I. Introduction

1. Electricité du Laos (EdL) intends to provide electricity to Sayabari, Xieng Khouang, Oudomxai, Louang Namtha, and Xaisomboun areas in northern Lao People's Democratic Republic (Lao PDR). The Project consists of (i) construction of about 303 kilometers (km) of 115 kilovolt (kV) transmission lines including shield-wire distribution at 34.5 kV; (ii) three 115/34.5/22 kV substations and other extension work concerned; (iii) construction of about 786 km of medium-voltage (34.5/22 kV) distribution lines and distribution substations; (iv) construction of approximately 608 km of low-voltage [380 volt (V)] distribution lines and transformers, and about 33,800 households electricity connection; and (v) miscellaneous work including cleaning of unexploded ordnance (UXO), benefit monitoring program, and resettlement and compensation program. A team of international consultants will be recruited to assist EdL implement the Project and improve its project management capacity. The team will include transmission and distribution specialists, social and environmental monitoring specialists and a UXO quality assurance specialist. The consultants will perform the above tasks with the objective of improving the design and Project supervision skills of the assigned EdL staff. The consultant is expected to carry out these tasks in Lao PDR. The consultant team is encouraged to use local expertise to undertake services where possible.

2. In addition to the above consulting services on project implementation, the following work will be included in the consultant services to further strengthen EdL's capacity for future rural electrification projects.

(i) **Capacity Building for Socioeconomic Assessment** - EdL is planning to establish a socio-economic cell to improve the coordination of data collection on electrification, build a consumer database and to build in-house capacity for benefit monitoring. In order to make efficient use of benefit monitoring data and to build future capacity for the evaluation of sub-projects, NDF and ADB agreed to support capacity building for economic, social and poverty impacts assessments of sub-projects. The capacity building component would include the training of three EdL staff in economic modeling for sub-project evaluation. EdL will appoint three staff, assigned to the socioeconomic cell, to be trained under the program. In addition, a number of field staff will be trained to collect relevant sub-project data to feed into the model. The consultants will set up the computerized model, establish a system for systematic data gathering, including standardized questionnaires for socioeconomic surveys and train staff. The system will be designed to ensure that benefit monitoring directly feed into the design and evaluation of future sub-projects. The Mission estimates that approximately three person-months will be required for setting up the model, establishing the systematic data gathering and for the training of staff. Additional three person-months will be required for the design and implementation of the benefit monitoring program. EdL agreed to use NDF credit for consulting services for the capacity building for socioeconomic assessment and for the benefit monitoring program.

(ii) **Consumer Awareness Campaign** - The consultants will assist EdL in the design and implementation of an information and awareness campaign to inform villagers on safe usage of electricity. The awareness campaign will also include informing consumers of connection cost policy, tariffs, billing statements and timing of bills.

9. CASE STUDY 1

Competitive Bidding of IPP Concessions

Kerawalapitiya Power Project, Sri Lanka

9.1 Background

- Sri Lanka has been experiencing a power crisis during which power has been cut to all customers for up to 5 hours per day.
- Competitive solicitations held for procuring emergency power.
- In parallel, the Government of Sri Lanka will invite bids from IPPs to develop a combined cycle gas turbine power station of about 300 MW on a BOT basis.
- Developers will be asked to bid either for a 300 MW plant or a 150 MW plant. If the latter, GOSL may accept two 150 MW bids and have the two power plants developed concurrently on adjacent sites.

9.2 Advantages of Competitive Bidding

- A competitive process offers many advantages over direct negotiation. The advantages and disadvantages are analyzed:

Disadvantages for the Government	Benefits for Government:
<ul style="list-style-type: none">• Depending on the structure of the solicitation, developers may be given little flexibility for innovation. They must respond to the bidding documents.	<ul style="list-style-type: none">• Lengthy and costly negotiations may be avoided
<ul style="list-style-type: none">• Cost of project studies and preparation must be met up-front by the public sector.	<ul style="list-style-type: none">• There is greater control over timing of implementation
<ul style="list-style-type: none">• Time is needed to prepare project studies and bidding documents.	<ul style="list-style-type: none">• Generally results in lower tariff (or higher royalties / taxes)
	<ul style="list-style-type: none">• Generally results in a more reasonable risk allocation;
	<ul style="list-style-type: none">• Lenders and multilateral and bilateral agencies are more comfortable with a competitive process.

and due payment, disconnection policy. The consumer awareness campaign will be implemented at least two months prior to connections. The campaign will take into account the possibility of language barriers in the design.

II. Scope of Work

A. Engineering Services

3. The selected consultant will be responsible for detailed engineering; preparation of bid documents; assistance in bid evaluation and contract awarding; and supervision of installation work, final testing, and commissioning. Specifically, the consultant will:

- (i) collect all engineering data required for designing the Project facilities;
- (ii) assist EdL in undertaking through local contractors, engineering surveys and soil investigations, if necessary;
- (iii) prepare detailed designs for transmission lines, grid substations, medium- and low- voltage distribution lines, and distribution substations, taking into account the design practices used by EdL and current international standards;
- (iv) using the distribution planning software available with EdL, undertake detailed distribution planning to achieve the lowest possible losses consistent with costs, acceptable supply quality, and reliability;
- (v) consolidate the above tasks into a design report giving Project details, costs, implementation schedule, and recommendations for mitigating any adverse environmental and sociological impacts, for approval by EdL and the Asian Development Bank (ADB);
- (vi) prepare bid documents for all equipment and services required for implementing the Project and suitable for international competitive bidding, international shopping, and local competitive bidding procedures as necessary and acceptable to ADB, Nordic Development Fund (NDF) and EdL. Procurement of goods and services financed from the ADB loan will be carried out in accordance with ADB's *Guidelines for Procurement*. Procurement of goods and services for substations package which are financed from NDF will be done in accordance with the *Guidelines of the Nordic Competitive Bidding*;
- (vii) assist EdL in inviting and evaluating bids and awarding contracts;
- (viii) approve the contractor's design drawings and witness tests on equipment if necessary;
- (ix) supervise the construction of Project facilities and provide guidance to the contractors so as to conform to the specifications;
- (x) assist EdL in instituting appropriate cost control, project accounts, and quality assurance mechanisms and checking and approving the contractor's bills for payments;

9.3 Bidding Strategy

- Two-stage bidding process is being adopted:
 1. Prequalification:
Applicants judged on: BOT Financing Record
Power Sector and CCGT Experience
Financial Strength
 2. Request for Proposals (RFP):
 - Bids will be invited from prequalified parties;
 - Bids will be evaluated and a preferred bidder chosen;
 - Negotiations will be conducted to resolve any deviations in the bidder's proposal.
- While the process seems similar to a normal ICB procurement process, there are important differences:
- RFP leaves as much of the technical detail to the bidders. Sets out only the government's basic requirements:
 - power outputs,
 - milestone dates,
 - quality standards, performance testing, etc.
 - constraints (e.g. environmental)
- The complex BOT risk allocations are specified.
- Bids will contain more deviations from the bidding documents because of the bidders' need to tailor the security package to the requirements of their lenders.
- Negotiation of these deviations can be tortuous and long. There is a danger that the competitively tendered tariff and risk allocation will be lost in the negotiations.

9.4 RFP Package

- A properly prepared "Request for Proposals" (RFP) is critical to the success of a BOT bid solicitation.
- An RFP should provide all the information a developer needs to prepare a bid that is:
 - informed and complete,
 - properly formatted,
 - binding, and
 - bankable

- (xi) witness commissioning, guarantee, and acceptance tests and assists EdL in taking over the completed facilities;
- (xii) review and compile "as-built" drawings and review the operation and maintenance manuals provided by the contractors for accuracy and adequacy;
- (xiii) compile a Project completion report (PCR) providing details of Project implementation, problems encountered, and solutions adopted, and detailing and explaining any variation in Projects costs and implementation times from the original estimates.

B. Unexploded Ordnance (UXO) Clearing

4. The UXO quality assurance specialist will:

- (i) ensure that the team leader and other members of the team are kept informed of all matters related to UXO clearance;
- (ii) review and approve the methodology to be used by the UXO clearance contractor/the Government agency;
- (iii) through active field monitoring, ensure that the work of the UXO clearance contractor complies with the specification, and that the correct methodology is followed and the procedures are quality assured for detection and disposal of any ordnance found;
- (iv) supervise the day-to-day duties (including drafting of job descriptions) of the UXO inspectors, if any, who may assist the UXO specialist; and
- (v) maintain proper and adequate records of all areas surveyed and all UXO detected and cleared.

C. Technical Support on Distribution Management and Loss Reduction

- (i) assist EdL's management in rationalizing the distribution operation in line with best international practices;
- (ii) propose an implementation plan to EdL within six months from the commencement of the assignment for a major campaign to check and calibrate all system metering, and update of the inaccurate meters; assist EdL in implementing this plan as well as other recommendations given from relevant studies;
- (iii) provide training seminars to EdL's staff to disseminate EdL distribution standards in all main field offices;

D. Social and Environmental Management

- (i) Carry out a detailed study of the environmental and sociological impacts of the Project, and optimize locations of substations and routing of lines to minimize the impact;

- The functions of a "Request For Proposals" (RFP) are:
 1. To inform a bidder about:
 - technical requirements of the project
 - the process for submitting bids
 - the information the bidder must provide in its bid
 - the evaluation process and criteria
 2. To set out models of the legal documents which:
 - provide clear parameters against which bids are to be prepared - e.g. LDs, government support, force majeure, change-in-law pass through, etc.
 - enable bidders to "price" the risk allocation
- The RFP for Kerawalapitiya contains the following documents:

1. Bidding Document	<ul style="list-style-type: none"> • Invitation to bidders • Information for bidders (inc. evaluation criteria) • Instructions to bidders
2. Bidder's Proposal and Supporting Data:	<ul style="list-style-type: none"> • Format and scope of technical information to be provided • Format and scope of financing plan to be provided
3. Model Contracts:	<ul style="list-style-type: none"> • Concession Agreement • Power Purchase Agreement • Fuel Supply Agreement • Land Lease Agreement
4. Minimum Technical Specifications	<ul style="list-style-type: none"> • Performance specification • Drawings

9.5 Application to Lao PDR

- If projects are not straightforward, competitively determined prices may be compromised during negotiation of "deviations" from bid documents.
- If this is a problem for combined cycle projects, competitive IPP solicitations in Lao PDR would have features that would greatly add to the difficulties. Lao projects would be more difficult to put out to competitive tender because they are:
 - (i) hydropower projects,
 - (ii) export projects.

- (ii) Guide and assist EdL's Environmental and Social Management Division to update the agreed Resettlement Plan for each component after detailed design is completed for each component, and implement and monitor the approved updated Resettlement Plans;
- (iii) Provide formal and on-the-job training in resettlement, social preparation, social impact assessment, gender, and social development related to power transmission and distribution projects to ensure that expertise is transferred to EdL's Environmental and Social Management Division, provincial and district staff, and other members of the project team and independent external monitoring agency, and to reinforce the existing knowledge of the staff and resettlement committees;
- (iv) Monitor compliance with the agreed Resettlement Plan and ensure that all information dissemination, consultation, disclosure, compensation and resettlement activities have been satisfactorily completed in accordance with the agreed Resettlement Plan and Loan Agreement and that income restoration measures are in place for a component before the civil works activities can begin on that component.

E. Capacity Building for Socioeconomic Assessment

5. The economist (3 person-months) will work closely with counterpart staff and complete the following tasks:

- (i) Set up a standardized spreadsheet model to evaluate economic feasibility and social and poverty impacts of sub-projects,
- (ii) Design standardized survey questionnaires and data imputation sheets and sub-project evaluation,
- (iii) Establish and test criteria for sub-project definition,
- (iv) Train staff in economic analysis, sub-project evaluation, data gathering and imputation and in running and updating the spreadsheet model,
- (v) Train field staff in survey questionnaires and data collection, and
- (vi) Otherwise assist in the capacity building of the socioeconomic cell of EdL.

F. Project Performance Monitoring and Evaluation (PPME)

6. The economist (2 person-months) will work closely with counterpart staff and complete the following tasks:

- (i) Design a Benefit Monitoring and Evaluation System (BME) with the purpose of assessing the social, poverty and economic impacts of electrification. The BME will feed directly into the evaluation of future electrification sub-projects;
- (ii) Develop indicators for assessing social, poverty and economic benefits of electrification. Develop impacts indicators for assessing affordability of tariffs and

(i) **Problems with hydropower projects** (compared to thermal):

- revenues are less certain (hydrological variation)
- capital costs are difficult to estimate (site-specific design)
- risks are greater (hydrology, ground conditions, etc.)
- environmental problems are harder to identify and price
- front-end capital requirements are higher
- export credit coverage is smaller
- construction times are longer and less certain

More must be known about a hydro project before it can be put out to competitive bid.

(ii) **Problems with export projects** :

- PPA and tariff are under the control of a third party who must agree a tariff, provide a PPA model and make no changes after closing date.
- Could base bids on a fixed tariff and tendered royalties

9.6 Bidding Hydro Concessions

- Hydropower is more difficult to tender than thermal projects because much more needs to be known about the site before a meaningful bid can be prepared. Even with abundant and reliable information, a bid is still more difficult to put together because of the site-specific nature of the design and the greater uncertainties.
- Problem of bidding hydropower concessions was studied under a World Bank paper, "*Financing of Private Hydropower Projects*", 1999. Three hydropower project bidding models were proposed:
 - One Stage
 - Two Stage
 - Hybrid
- Features of the **One Stage** process:
 - Full site investigations, EIA and preliminary design in the public sector
 - A bankable RFP package containing model agreement, studies, etc. to define risk allocation, tariff structure and other conditions of the bid.
 - High cost of project preparation borne by the public sector.

costs associated with connection and inside wiring, and willingness to pay. Design corresponding standardized survey questionnaires;

- (iii) Train staff in field survey techniques and data imputation;
- (iv) Implement the baseline survey and conduct a distributional analysis of expected impacts of electrification. Assess potential impacts of tariff changes and the ability of poor to pay for upfront charges and costs associated with connection; and
- (v) Submit a report on the BME to ADB and NDF for review and approval.

G. Consumer Awareness Campaign

7. The communications specialist (1 person-month) will in close collaboration with EdL counterpart staff conduct the following tasks:

- (i) Assess the most efficient and appropriate means of disseminating information to consumers with wide cultural diversities, language and illiteracy barriers
- (ii) Assist EdL in the design and implementation of a campaign to disseminate consumer information on safe usage of electricity, connection costs, inside wiring, tariffs, billing and payment practices.

III. Reporting Requirements

8. In addition to the design report, the consultants will provide a brief inception report within four weeks from the commencement of the assignment, a quarterly progress report (including BME activities) within 15 days from the end of each quarter, and a Project completion report, at the end of the assignment. Three copies of these reports will be provided to EdL, three copies to ADB (two to Manila and one to Lao Resident Mission) and two copies to NDF.

IV. Expertise Required and Person-Month Estimates

9. About 100 person-months of international consulting, to be associated local expertise are needed for consulting services on planning, design, and construction of high-voltage transmission lines including shield-wire distribution; high-voltage substations; low-and-medium voltage lines and substations; loss reduction; and environmental and sociological aspects of infrastructure development.

10. A international quality assurance expert with experience in UXO detection and clearing will also be required. The UXO quality assurance expert's input is envisaged to be approximately four person-months.

11. The economist will have documented experience with project evaluation of power projects and have a background in economic, social and poverty impact assessment and evaluation of rural electrification projects with a focus on end-consumers. The consultants will have experience in training and capacity building in economic modeling. Experience from the region, preferably from Lao PDR, are required. The economist will conduct tasks related to capacity building for socioeconomic assessment and benefit monitoring with a total of 5 person-months.

- Features of the **Two Stage** process:

Stage 1:

- Less detailed feasibility and EIA studies by GOL
- RFP documents include drafts of project agreements, etc. and provisional cost estimate
- Concession awarded to lowest tariff (or highest royalty) based on provisional project cost estimate

Stage 2:

- Developer does detailed investigation and design
- EPC contract is put out to competitive bidding and provisional cost estimate is updated to a binding EPC cost.
- Using a pre-agreed formula, the tariff (or royalty) is adjusted to reflect the binding EPC cost.

- Features of the **Hybrid** model

The Hybrid Model takes the form of a public-private partnership on multi-purpose projects with the government taking responsibility for the major civil works for an irrigation or water supply project and the private sector taking responsibility for the lower risk power components. The model probably has limited application in Lao PDR where the projects tend to be single purpose.

- None of the models deals with the complexities introduced by cross border off-take. The involvement of a power purchaser in another country would need to be thought through carefully.

9.7 Bidding Export Projects

- Bidding of hydropower can either be on the basis of the lowest offered energy price or the highest payment for the water rights (royalty). With export projects, where the price is under the control of a foreign power purchaser, the royalty approach would be more effective.
- Export of off-take complicates competitive bidding. PPA and tariff are outside the control of GOL. Pre-tender agreement would therefore need to be reached on the tariff value and PPA in government-to-government negotiations. Inevitably, bidders will include deviations to the PPA in their bids and solidarity between GOL and the power purchaser would be needed during the negotiation of these deviations. Lack of solidarity would risk losing the competitive advantage of the bid in a drawn out three-way negotiation process. The process might involve:
 - GOL and the power purchaser agree a tariff and a PPA model prior to solicitation.

12. The communications specialist will have documented experience from developing and implementing effective communication, media and information dissemination programs in developing countries, preferably from the region and Lao PDR. The consultant will be familiar with issues related to rural electrification, end-consumer preferences, barriers of low-income segments of the population and cultural diversity. The communication specialist will have strong communication skills.

13. Based on above, a total of 110 person-months of international consulting, to be associated with about 20 person-months of local expertise, will be required spread over a period of four years.

V. Executing Agency (EA)

14. The EA will provide the office space at its headquarters, secretarial services, fax and telephone facilities, transport to Project sites, and interpreter services as required for the efficient execution of the services.

- Bidders are invited to tender a royalty figure on the basis of a known and fixed tariff and PPA.
- During negotiations, the power purchaser and GOL must present a single voice to the preferred bidder and resolve issues between them behind closed doors.

9.8 Is Direct Negotiation Justified?

- Direct negotiation of an unsolicited proposal involves greater risks to Government. However, it might be justified where a hydropower project involves features that make it unsuitable for bidding.
- If direct negotiation is used, a strict framework and procedures should be designed to control the process.
- Some recommended conditions for direct negotiations:
 - A rigid implementation procedure is defined and adhered to.
 - Strict milestone and expiry dates are specified in MOUs and concession agreements to control implementation progress.
 - All engineering procurement and construction contracts procurement should be awarded by ICB or LCB to ensure that the construction cost is fair.
 - Government engages international advisers with relevant experience to ensure parity across the negotiating table.
 - Government prepares drafts of agreements for negotiation based on standard models prepared for GOL.
 - Swiss Challenge provisions could be considered to encourage competitive prices – i.e. testing the developers' proposals by inviting others to bid on them.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION (SIEE)

A. Introduction

1. An initial environmental examination (IEE) for the project was undertaken as part of the Project feasibility study. The Project is classified as environmental category B, as per Asian Development Bank's (ADB) *Environmental Assessment Requirements of the Asian Development Bank*. The IEE is based on an analysis of the impacts of the proposed works and a visual assessment of the project areas, and its main findings are summarized as follow.

B. Description of the Project

2. The project will extend the transmission and distribution system in the Northern rural area. The details of the Project are given in the main text of the report.

C. Description of the Environment

1. Physical Resources

3. The northern Lao provinces are characterized by their young landscapes. The topography is predominantly steeply dissected hill country, ranging in elevation from 320 m valley bottom areas like Sayaburi and Louang Prabang to over 2000 m on mountain ridges. Approximately 85 percent of Louang Prabang Province is mountainous. Oudomxai is also a mountainous province. The slopes of the lower hill zone tend to be steep where tributaries have down cut in V-shaped valley bottoms. Upper hill slopes tend to be less steep and more rounded. Large flat areas are rare, occasionally along the Mekong and other major rivers where valleys open up to allow river flood plains to develop.

4. The steep mountain slopes are particularly prone to erosion and mass wasting when vegetation is removed and soils are exposed to rainfall and surface water flows. Water quality in the mountain streams and rivers is generally quite high, but can be rapidly degraded when soils that are eroded or washed from exposed slopes enter streams and increase turbidity, thereby, degrading the quality of water for aquatic organisms, and domestic and live stock consumption.

5. The climate is subtropical. The rainy season starts in April and ends in September or October, when the region receives 85 percent to 91 percent of its annual rainfall.

2. Ecological Resources

6. The steep terrain of northern Lao PDR is part of an intricate system of streams and rivers that form the Mekong River watershed. No significant wetland areas were encountered, aside from the network of streams and rivers. Many villagers supplement their diets with fish, fresh water crabs, and other aquatic organisms caught from the streams and ponds.

7. The latest satellite data of the northern Lao provinces indicates that only 21% of northern Laos is covered by forest. At present, there are only small pockets of primary forest left in the Project area. The Government has established 20 National Protected Areas (NPAs) throughout the country. In addition to NPAs, the provinces and districts have established a number of Provincial Protected Areas (PPAs) and District Protected Areas (DPAs) respectively. However, the borders of the most of PPAs and DPAs are not clearly defined and the level of protection is not defined.

10. CASE STUDY 2

Competitive Bidding of EPC Contracts

Theun Hinboun vs. Houay Ho

10.1 Background

- Two IPP projects in Lao PDR have been completed and are selling power to EGAT:
 - Theun Hinboun
 - Houay Ho
- Superficially, there are similarities between the projects but their financial performances are in stark contrast.

	Theun Hinboun	Houay Ho
Type	Hydropower	Hydropower
Capacity	150 MW	240 MW
Capital Cost (inc. IDC)	USD 240 mill	USD 260 mill
GOL Equity	60%	20%

- Houay Ho has since been sold to Tractabel of Belgium and many of the conditions of the concession have been re-negotiated in the process.

10.2 Financial Performance

1. Theun Hinboun

- Was profitable from the first year of operation.
- Pays taxes & royalties to GOL and pays dividends to EdL. Effect on EdL cash flow was immediate, significant and beneficial.

8. Nam Phouy National Protected Area, at closest point, lies within 5km from 22 kV line between Xaibouli and Ban Namxong. Although it suffers from a degree of natural resource exploitation by residents in local area, it is also an important area of wildlife habitat for species such as Asian elephant, tiger, gaur, Asian wild dog, and Asiatic black bear.

3. Human and Economic Development

9. Agriculture, forestry, and fishing are the major economic sectors in Lao PDR. Rice cultivation is occupying about 80 percent of all land used for agriculture. Commercial crops include sugar cane, tea, coffee, sesame and cotton. Nearly 90 percent of rural household raise livestock, including buffaloes, cattle, pigs and poultry, for household consumption and to sell.

10. Within the Project area, there is a range of small- and medium-scale industrial activities. These include garment factories, furniture factories, agro-processing industries including distilleries, breweries, and meat processing factories. There are sawmills in Phongsali and Sayaburi, with 50-200 employees each.

11. The Plain of Jars is a World Heritage Site and major tourist attraction for Xieng Khouang. The town of Louang Prabang is also World Heritage site.

12. Screening of Potential Environmental Impacts and Mitigation Measures

12. The following potentially significant impacts are identified and their mitigation measures are available.

1. Natural Vegetation and Wildlife

13. The 115-kV lines will be sited minimizing impacts on natural vegetation. The Project will rely on existing roads for construction and maintenance. No new roads will be constructed, and only small access tracks for light duty vehicles will be needed at selected spots for construction and maintenance purposes. Due to the poor habitat conditions and heavy human use along the alignments, wildlife will not be significantly affected. The 34.5/22 kV distribution system will generally be situated within existing rights-of-way and, therefore, the impacts generated by the distribution network are much less significant than the 115 kV system.

14. Close attention will be paid to PPAs, DPAs and forests in order to avoid or minimize the impacts on the environment. The alignment is planned along the highways, along which the environment has been degraded by human activities. There are several PPAs and DPAs located near the highways though their exact locations are not well demarcated, and two DPAs straddle the highway in Oudomxai Province. During the detailed design survey, the alignment will be selected in close consultation with local forestry officials to minimize further degradation of the environment. If secondary or plantation forest is found necessary to be cut during the detailed design, it will be done under close consultation with the Department of Forestry. Compensation will be paid according to Lao Forestry Law and regulations for compensatory planting. In dissected or steeply undulating areas, clearing of the right-of-way will not be necessary where the tops of the highest trees are a safe distance from conductor. To avoid possible poaching by construction contractors and laborers of small mammals and birds, the possession of firearms or animal traps by project staff and work crews will not be allowed.

15. EdL will carry out corridor maintenance using manual means of trimming the vegetation. It will not use herbicide. Vegetation beneath the transmission lines is maintained in an early seral stage to provide for minimum clearance of 10 m from the conductors.

2. Houay Ho:

- Prior to its sale to Tractabel recently, it paid no taxes or royalties to GOL and no dividends to EdL. It was not expected to be profitable within its concession period.
- EdL borrowed money to purchase its equity in the project. Interest and principal repayments associated with this loan meant that the impact of the project on EdL's cash flow was immediate, significant and negative.

10.3 Reasons for Theun Hinboun's better performance

- It occupies a superior hydropower site
- It had Multilateral Agency backing - guarantee plus concessionary money to pay for EdL's equity
- It negotiated a more favorable tariff with EGAT
- It benefited from delays to Nam Theun 2 (windfall streamflow benefit)
- It used International Competitive Bidding for its construction contracts, while Daewoo awarded the contract to its own construction company without competition.

10.4 Advantages of ICB

- Theun Hinboun Power Company benefited from competitively tendering its contracts:
 - transparency resulted in multilateral and lender acceptance;
 - no due diligence processes needed to justify the price;
 - competition resulted in lower prices;
- The most significant benefit was the competitive price. (20% below estimate, c.f. Houay Ho which exceeded its estimate by about 60%)
- Nam Theun 2 is following a similar path: multilateral support and ICB award of its construction subcontracts.

16. The Project will involve only minimal excavation that could contribute to soil erosion and the potential for sedimentation of water source.

2. Land Use and Resettlement

17. During selection of the alignments, efforts were made to avoid existing settlements, private and community structures, agricultural land, mature forest and environmentally sensitive areas. During the detailed alignment survey, villagers along the route will be consulted. The potential for resettlement is minimal.

3. Health and Safety

18. Main health risks during the construction stage may arise from (i) inadequate sanitation facilities in worker camps, (ii) introduction of sexually transmitted or other diseases by immigrant workers, (iii) outbreaks of malaria in the labor force, and (iv) explosion of UXO. In order to avoid these risks, (i) contractor will prepare worker health and safety plan, (ii) workers will receive health and safety training, (iii) workers will undergo pre-employment health screening, (iv) UXO will be cleared before construction. Also, local villagers will receive health education.

4. Encroachment of Historical and Cultural Sites

19. The alignments will be selected to avoid or minimize visual intrusion of the transmission lines into the two World Heritage sites in the project area, and approval for the alignments will be obtained as required by the Government.

E. Institutional Requirements and Environmental Monitoring Program

20. EdL will bear full responsibility for ensuring that the project complies with best environmental practices and meets the mitigation and monitoring requirements described in the IEE report. EdL will establish a Project Environmental Management Office (EMO) consisting of a representative of EdL's Environmental Management Unit of Environmental and Social Division, the Contractor, and relevant ministries of the Government Lao PDR in order to implement environmental management plan and monitoring.

21. The EMO will prepare monthly environmental management reports for submission to EdL, and the reports will be sent to other ministries for review and inspections. In addition, EdL will prepare quarterly summaries for inclusion in the Quarterly Progress Report to the ADB.

F. Findings and Recommendations

22. The environmental screening process for the project was adequate. Overall environmental impacts are deemed to be minor because:

- (vii) Careful consideration has been given to route selection to avoid environmentally sensitive areas and minimize disturbance to private or community.
- (viii) There is potential for resettlement of two houses. If the houses will be resettled, they will be compensated.
- (ix) Measures are readily available to mitigate potential impacts.

