

**VIE: MONG DUONG 1 THERMAL POWER PROJECT**  
**Terms of Reference for Implementation Consultants**

**A. Objective**

1. A phased approach is being taken to develop, finance, and implement the proposed 2,000-2,200 MW Mong Duong coal power complex (the Project) in Viet Nam. The Project comprises of two components, phase 1 will comprise of the first 1,000 MW (Mong Duong 1) power plant to be built by the public sector, while phase 2 (Mong Duong 2) comprises of the extension of the overall project to provide an additional 1,000-1,200 MW to be built by a private sector through a built operate and transfer arrangement.

2. The phase 1 development is itself is divided into Part A and Part B:

- Part A will provide consulting services for:
  - pre-construction works for the overall Mong Duong (1 and 2) power complex;
  - preparation of the detailed designs and EPC bidding documents for Mong Duong 1; and
  - related implementation measures for the Social, Resettlement and Environmental Plans.

Part A consulting services will terminate at the point of contract award of the EPC and other project contracts but the consultants responsible for supervision of the implementation of the resettlement plans and environment management plans will continue working till project completion.

- Part B consulting services will provide for the project implementation and construction supervision of the 1,000 MW Mong Duong 1 generation facilities until commissioning of the power plant.

3. The consulting services specified herein relate only to Phase 1A (i.e. Phase 1, Part A) of the development which is being financed by ADB under two separate loans following ADB's Multitranches Financing Facility (MFF). EVN will be the Executing Agency for the project, and EVN's "Thermal Power Management Unit No. 1" (TPPMU1) will be the Project Implementing Unit (PIU).

**B. Scope**

4. The scope of consulting services (Phase 1A) includes: (a) reviewing draft technical designs, bidding documents and drawings prepared by EVN for Phase 1; (b) revising EVN's detailed designs as necessary, and preparing final technical designs; (c) finalizing bid documents for the pre-construction civil works; (d) examining options for financing the EPC contract in Phase 1 (including tranching financing) and making recommendations on the planned structure; (e) finalizing bid documents for selection of the EPC contractor; (f) assisting EVN in all bidding, contract negotiations and contract awards, including for the EPC contract; (g) overall supervision of Phase A pre-construction civil works implementation; (h) assisting TPPMU1 in implementing environmental and social safeguards under the Environmental Management Plan and Resettlement Plan; (i) undertaking a social impact assessment; (j) guiding and supervising resettlement committees; training staff of TPPMU1, the Project Management Unit and various environmental and resettlement committees; (k) capacity building for counterpart staff and other EA staff in new technology such as CFB; project management; procurement; and on ADB

guidelines for procurement, invoicing, and payments; and (k) guiding implementation of the gender strategy.

The main components of the EPC package are given below:

- Turbo-generators and auxiliaries
- Boiler and auxiliaries
- Coal handling plant
- Balance of plant (oil supply, ash handling, electrostatic precipitator, limestone supply)
- Control and instrumentation
- Electrical equipment
- 500kV switchyard
- Communication system
- Workshop and laboratory equipment
- Other electrical systems
- Raw water supply system
- Spare parts
- Associated civil works
- Installation, testing and commissioning
- Capacity building of EA staff
- Site preparation and provision of common services for Part 2
  - Site leveling and resettlement
  - Diversion of Mong Duong River
  - Temporary contractor storage area
  - Temporary boundary fencing
  - Jetties for heavy fuel oil, limestone and unloading
  - Site boundary drainage
  - Fire truck station
  - Ash pond 1 (and ash pond 2 later)
  - Main access road to the site, access roads to the jetties, and temporary boundary road for construction within the site
  - Raw water supply system to the site
  - Site construction power and construction water supplies
  - Cooling water discharge channel beyond the outfall

### **C. Terms of Reference**

5. An international consultancy firm with extensive experience in the design and implementation of coal fired power plants (using pulverized coal and particularly CFB technologies) in developing countries to team up with suitable domestic consultants to provide consultancy services required under Phase 1A of the Project as outlined above. The scope of work comprises provision of consultancy services until the award of site preparation civil works contracts for site preparation, supervision Mong Duong 1. The present terms of reference do not include implementation supervision, but terminate at contract award for each procurement package.

#### **1. International Consultants**

##### **a. Project Manager**

6. A total of 24 person months of international consultant services will be required, covering

design, procurement and implementation phases of Part 1 of the Project. The consultant will have a suitable engineering degree or equivalent and have extensive experience in managing large thermal power projects in developing countries.

The consultant shall provide the following services:

- (i) Review the Investment Study (IS, previously Feasibility Study) prepared by PECC1.
- (ii) Develop an overall Project plan that indicates the EPC related work activities (under Part 1 of the Project including common services for Part 2) from notice to proceed to completion of Part 1. The plan should identify minimum tasks required for the commercial operation of Part 1 and identify roles and activities assigned to others including consultants.
- (iii) Periodically review the work plan of each team specialist (including domestic consultants) and ensure an equitable allocation of work responsibility.
- (iv) Put in place a process to provide for advanced planning of EPC contract activities on a task-by-task basis. This shall include the development of a work plan, submission of documents in a timely manner, and provision of a cost-time history to enable development of a suitable recovery plan should delays occur. Coordinate activities of international and domestic consultants to ensure that objectives of Part 1 are realized in a timely and cost effective manner.
- (v) Liaise regularly with Part 2 owners regarding their overall project program and ensure co-ordination of activities.
- (vi) For common facilities for Part 1 and 2 that are to be provided under Part 1, ensure that all required data has been obtained from Part 2 sources and agreed to by EA.
- (vii) Plan, in coordination with relevant team specialists and EA, for efficient utilization of site lay down areas by the EPC contractor to ensure no interference or additional cost to construction activity. Monitor implementation of this plan.
- (viii) Regularly liaise with the steering committee for the Project.
- (ix) Put in place a system of administration that allows accounting of costs and provides administrative control over personnel engaged in Part 1. The administration process must ensure that work is pursued effectively and as planned.
- (x) Ensure that documentation developed under Part 1 is of a quality conforming to generally acceptable engineering practices. All assumptions shall be clearly listed for later retrieval by those engaged in later stages of Part 1. This should include all necessary notations relative to units such as elevation, length, area, volume, weight, temperature and heat. The use of sketches and diagrams shall be encouraged to minimize later misunderstandings and to maximize reuse. All documents should be clearly readable without enhancement.
- (xi) Provide a monthly status report to the EA and the ADB. This report will indicate the following:
  - progress at the month's end as measured against the planned schedule.
  - work to be undertaken in the next monthly period.
  - identification of any delays or hindrances to progress.
  - any recovery plans to be implemented.

- identification of work that is stopped pending a change in scope of work.
  - reporting expenditures incurred to date.
- (xii) Ensure consultants provide capacity building for relevant EA, PIU and TPPMU1 staff through seminars and on-the-job training during project implementation. This applies in particular to new technology including CFB; project management; procurement; and ADB guidelines for procurement, invoicing, and payments.

#### **b. Boiler Specialist**

7. A total of 7 person months of international consultant services will be required. The consultant will have a suitable degree in mechanical engineering or equivalent and have extensive experience in design and installation of CFB power boilers and PC power boilers at large power plants. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the boiler and auxiliaries from feasibility-level designs and in discussion with EA. The design engineering will provide EPC bidders with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, and piping, electrical and instrumentation diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and the base requirements. The units for all calculations will be the "Systeme Internationale D'Unites," commonly called SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iii) Assist the Procurement specialist in preparing the boiler and auxiliaries' component of the EPC bid documents, to be procured in line with the ADB's *Guidelines for Procurement*. The consultant will give due regard to critical performance criteria of the equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (iv) To ensure that bid documents require bidders to quote unit rates as well for computation of potential variation in scope of supply that may arise during implementation.
- (v) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) In consultation with EA, the consultant shall prepare evaluation criteria in line with the ADB's *Guidelines for Procurement* for the boilers and auxiliaries procurement component of the EPC package. The bid package shall optimize energy efficiency by applying price adjustments during evaluation based on established and declared formulae and application of financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow rejection of a bid that does not

conform to bid requirements.

- (vii) The consultant, with support of other team specialists as required and EA shall assist in responding to questions from prospective bidders during prebid meetings.
- (viii) Together with relevant team specialists, the consultant will evaluate bids received in accordance with the evaluation criteria developed and provide recommendations on award of contract..

**c. Turbine Specialist**

8. A total of 7 person months of international consultant services will be required. The consultant will have a suitable degree in mechanical engineering or equivalent and have extensive experience in design and installation of 500MW steam turbines at coal fired power plants. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the turbine and auxiliaries from feasibility-level designs and in discussion with EA. The design engineering will provide bidders with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, piping, electrical and instrumentation diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and the base requirements. The units for all calculations will be SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iii) Assist the procurement specialist in preparing the turbine and auxiliaries component of the EPC bid documents, to be procured in line with the ADB's *Guidelines for Procurement*. The consultant will give due regard to critical performance criteria of the equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (iv) To ensure that bid documents require bidders to quote unit rates as well for computation of potential variation in scope of supply that may arise during implementation.
- (v) As bidding for the EPC package will be one stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) In consultation with EA, the consultant shall prepare evaluation criteria in line with the ADB's *Guidelines for Procurement* for the turbines and auxiliaries procurement component of the EPC package. The bid package shall optimize energy efficiency by applying price adjustments during the evaluation based on established and declared formulae and application of financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow the rejection of a bid that does not conform to bid requirements.

- (vii) The consultant, with support of relevant team specialists and EA shall assist in responding to questions from prospective bidders during prebid meetings.
- (viii) Together with relevant team of specialists the consultant will evaluate bids received in accordance with evaluation criteria developed and provide recommendation on award of contract.

**d. Civil Works Specialist**

9. A total of 24 person months of international consultant services will be required. The consultant will have a suitable degree in civil engineering or equivalent and have extensive experience in design and construction of civil works for large coal fired power stations. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the civil works for Part 1 of the Project, for common facilities with Part 2 and site preparation works based on feasibility level designs and in discussion with EA.
- (iii) For the EPC package, the design engineering will provide bidders for procurement packages with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, piping, electrical, instrumentation and electrical diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and the base requirements. The units for all calculations will be SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iv) Assist the Procurement specialist prepare the civil works component of the EPC bid documents. The consultant will give due regard to critical performance criteria of equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (v) To ensure that bid documents require bidders to quote unit rates as well to allow for computation of variation in civil works or site preparation and common works that may arise during implementation.
- (vi) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vii) In consultation with EA, the consultant shall prepare evaluation criteria for site preparation and common works, and civil works. The bid package shall optimize energy efficiency by applying price adjustments during the evaluation based on established and declared formulae and application of financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow the rejection of a bid that does not conform to bid requirements.
- (viii) The consultant, with support of relevant team specialists and EA shall assist in responding to questions from prospective bidders during prebid meetings.

- (ix) Together with relevant team specialists, the consultant will evaluate bids received in accordance with evaluation criteria developed.
- (x) Review and approve relevant submissions from the contractor, and monitor project implementation, ensuring all approvals are obtained by the contractors from authorities.
- (xi) Provide the Project Manager with monthly progress reports on the contract including payments certified and highlighting issues and potential problems.
- (xii) Review operation and maintenance manuals and ensure they are of high quality.
- (xiii) After taking over the site preparation civil works, prepare a completion report document for EA describing main issues, findings, variations issued, results of testing done and recommendations.

**e. Electrical Specialist**

10. A total of 5 person months of international consultant services will be required. The consultant will have a suitable degree in electrical engineering or equivalent and have extensive experience in design and installation of electrical systems up to 500kV at large coal fired power stations. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the high and low voltage electrical system from feasibility-level designs and in discussion with EA. The design engineering will provide bidders for procurement packages with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, piping, electrical and instrumentation diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and base requirements. The units for all calculations will be SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iii) Assist the Procurement specialist in preparing the electrical component of the EPC bid documents to be procured in line with the ADB's *Guidelines for Procurement*. The consultant will give due regard to critical performance criteria of the equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (iv) To ensure that bid documents require bidders to quote unit rates as well for as many types of additional or variation in electrical items that can arise during implementation.
- (v) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) In consultation with EA, the consultant shall prepare evaluation criteria in line with the ADB's *Guidelines for Procurement* for procurement of the electrical system component of the EPC package. The bid packages for the electrical system shall optimize energy efficiency by applying price adjustments during

evaluation based on established and declared formulae and application of financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow the rejection of a bid that does not conform to bid requirements.

- (vii) The consultant, with support of relevant team of specialists and EA shall assist in responding to questions from prospective bidders during prebid meetings.
- (viii) Together with relevant team specialists the consultant will evaluate bids received in accordance with the evaluation criteria developed and provide recommendation on award of contract.

**f. Instrumentation and control specialist**

11. A total of 5 person months of international consultant services will be required. The consultant will have a suitable degree in electrical engineering or equivalent and have extensive experience in design and installation of instrumentation and control systems at modern large coal fired power stations. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the instrumentation and control system from feasibility-level designs and in discussion with EA. The design engineering will provide bidders with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, piping, electrical and instrumentation and control diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and the base requirements. The units for all calculations will be SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iii) Assist the Procurement specialist in preparing the instrumentation and control system component of the EPC bid documents to be procured in line with the ADB's *Guidelines for Procurement*. The consultant will give due regard to the critical performance criteria of the equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (iv) To ensure that bid documents require bidders to quote unit rates as well for as many types of additional or variation in instrumentation and control that can arise during implementation.
- (v) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) In consultation with EA, the consultant shall prepare evaluation criteria in line with the ADB's *Guidelines for Procurement* for the control and instrumentation component of the EPC package. Bid packages for the instrumentation and control system shall optimize energy efficiency by applying price adjustments during evaluation based on established and declared formulae and application of

financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow the rejection of a bid that does not conform to bid requirements.

- (vii) The consultant, with support of relevant team of specialists and EA shall assist in responding to questions from prospective bidders during prebid meetings.
- (viii) Together with relevant team specialists, the consultant will evaluate bids received in accordance with evaluation criteria developed and recommendation on award of contract. .

#### **g. Auxiliary Plant Specialist**

12. A total of 7 person months of international consultant services will be required. The consultant will have a suitable degree in mechanical engineering or equivalent and have extensive experience in design and installation of oil supply system, ash handling plant, electrostatic precipitator, limestone supply system, workshop equipment and laboratory equipment at large modern coal fired power plants. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Develop basic design of the balance of plant, workshop and laboratory equipment components of the EPC package from feasibility-level designs and in discussion with EA. The design engineering will provide bidders with sufficient information to provide a complete package. Drawings prepared will include site and plant general arrangements, piping, electrical and instrumentation diagrams. In addition, any calculations required to support the procurement process will be provided. This will include a listing of any assumptions and base requirements. The units for all calculations will be SI. Any conversion from other systems of measure will be clearly identified, showing the unit (to/from) and conversion factor.
- (iii) Assist the Procurement specialist in preparing the 2 component packages (balance of plant, workshop and laboratory equipment) of the EPC bid documents to be procured in line with the ADB's *Guidelines for Procurement*. The consultant will give due regard to the critical performance criteria of the equipment, include state-of-the-art features where appropriate, and make recommendations whether accessories should be specified as part of the base bid or as options. This applies in particular to spare parts.
- (iv) To ensure that bid documents require bidders to quote unit rates as well for as many types of additional or variation in contracts that can arise during implementation.
- (v) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will develop specific criteria that cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) In consultation with EA, the consultant shall prepare evaluation criteria in line with the ADB's *Guidelines for Procurement* for the procurement of relevant components of the EPC package. The bid packages shall optimize energy efficiency by applying price adjustments during evaluation based on established

and declared formulae and application of financial penalties (liquidated damages) for failure of the successful contractor to meet guaranteed performance. In addition, the criteria shall allow the rejection of a bid that does not conform to the bid requirements.

- (vii) The consultant, with support of relevant team specialists and EA shall assist in responding to questions from prospective bidders during prebid meetings.
- (viii) Together with relevant team specialists the consultant will evaluate bids received in accordance with the evaluation criteria developed and provide recommendation on award of contract.

#### **h. Procurement Specialist**

13. A total of 10 person months of international consultant services will be required. The consultant will have a suitable degree in engineering or equivalent and have extensive experience in procurement at modern large coal fired power stations. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Study the ADB's *Guidelines for Procurement* and the ADB approved procurement methodology for the EPC contract.
- (iii) Discuss with EA, the ADB's procurement guidelines and establish a methodology and time line for the EPC package taking into the account program schedules for Parts 1 and 2.
- (iv) With the assistance of team specialists prepare the EPC bid documents including commercial conditions and technical specifications taking care to ensure uniformity of requirements, completeness, timeliness and sequencing of bidding to maintain proper information flow.
- (v) As bidding for the EPC package will be single stage, two-envelope, the consultant, with support of EA will ensure that specific criteria developed for evaluation are fair and cannot be misinterpreted and will protect the purchaser by ensuring only bidders that are technically, commercially, and financially capable and have specified minimum experience will be evaluated further. Bidders unable to meet these specified requirements shall be rejected.
- (vi) Assist in responding to questions from prospective bidders during prebid meetings.
- (vii) Assist team specialist evaluate bids received in accordance with approved evaluation criteria.
- (viii) Ensure that the technical evaluation report with a recommendation for financial evaluation of the EPC package shall be submitted within 60 calendar days of bid opening to EA and then to the ADB for approval.
- (ix) After ADB approval, proceed with financial evaluation and submit an evaluation report with recommendation for award of contract to EA and then ADB for approval.
- (x) After ADB approval, in consultation with EA, assist in the award of contract to the approved bidder.
- (xi) Provide the Project Manager with monthly progress reports on progress of procurement, highlighting issues and potential problems.

- (xii) Provide capacity building for EA on procurement and related ADB guidelines.
- (xiii) After taking over of Part 1, prepare a procurement completion report document for EA describing main issues, findings and recommendations.

#### **i. Accountant**

14. A total of 45 person months of international consultant services will be required during the implementation phase of Part 1 from award of the EPC package to process, monitor contract payments. The consultant will have suitable accounting qualifications and have extensive experience in project accounting of contracts, invoicing, and making payments at large power plant construction sites. Experience in developing countries will be an advantage.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Be familiar with the EPC contract package and the payment terms.
- (iii) Understand ADB and EA procedures with regard to invoices, payment and monitoring of payments and costs.
- (iv) Prepare a master schedule of expected payments and update them regularly.
- (v) Advise the ADB and EA quarterly of any changes to the master schedule.
- (vi) Prepare invoices to the ADB and EA for authorized payment requests by the EPC contractor.
- (vii) Follow up on payments due to contractors with ADB and EA.
- (viii) Provide the Project Manager with monthly progress reports on payments made, outstanding amounts and highlighting issues and potential problems.
- (ix) Provide capacity building for EA on invoice/payment issues and capacity building of relevant EA, PIU and TPPMU1 staff on relevant ADB guidelines.
- (x) After taking over of Part 1 plant, prepare a completion report document for EA describing contract costs, variations, payments made, amounts withheld, main issues and recommendations.

## **2. National Consultants**

### **a. Boiler Specialist**

15. A total of 5 person months of national consultant services will be required. The consultant will have a degree in mechanical engineering or equivalent and have good experience in design and installation of coal fired power boilers in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international boiler specialist develop a basic design of the boiler and auxiliaries from feasibility-level designs and in discussion with EA.
- (iii) Assist the international boiler specialist in preparing the technical specifications for the boiler and auxiliaries.
- (iv) Assist the international boiler specialist in preparing the evaluation criteria.
- (v) Assist the international boiler specialist in responding to questions from prospective bidders during prebid meetings.

- (vi) Assist the international boiler specialist in evaluating the bids received.

**b. Turbine Specialist**

16. A total of 5 person months of national consultant services will be required. The consultant will have a degree in mechanical engineering or equivalent and have good experience in design and installation of steam turbines at coal fired power plants in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international turbine specialist develop a basic design of the turbine and auxiliaries from feasibility level designs and in discussion with EA.
- (iii) Assist the international turbine specialist prepare technical specifications for the turbine and auxiliaries.
- (iv) Assist the international turbine specialist in preparing the evaluation criteria.
- (v) Assist the international turbine specialist in responding to questions from prospective bidders during prebid meetings.
- (vi) Assist the international turbine specialist in evaluating the bids received. .

**c. Civil Works Specialist**

17. A total of 24 person months of national consultant services will be required. The consultant will have a degree in civil engineering or equivalent and have good experience in design and construction of civil works for coal fired power boilers in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international civil works specialist develop a basic design of the plant and equipment from feasibility-level designs and in discussion with EA.
- (iii) Assist the international civil works specialist prepare technical specifications for civil works and common works.
- (iv) Assist the international civil works specialist prepare evaluation criteria.
- (v) Assist the international civil works specialist respond to questions from prospective bidders during prebid meetings.
- (vi) Assist the international civil works specialist evaluate bids received.
- (vii) Assist the international civil works specialist monitor implementation of civil works and common works components of the EPC contract, ensuring all approvals are obtained by the contractors from authorities.
- (viii) Assist in the review of operation and maintenance manuals.
- (ix) Assist the international civil works specialist prepare a completion report document for EA on the civil works and common works component describing main issues, findings, variations issued, results of testing done and recommendations.

**d. Electrical Specialist**

18. A total of 5 person months of national consultant services will be required. The consultant will have a degree in electrical engineering or equivalent and have good experience

in design and installation of electrical systems at coal fired power stations in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international electrical specialist develop basic design of the plant and equipment from feasibility-level designs and in discussion with EA.
- (iii) Assist the international electrical specialist in preparing technical specifications for the electrical system.
- (iv) Assist the international electrical specialist in preparing the evaluation criteria.
- (v) Assist the international electrical specialist in responding to questions from prospective bidders during pre-bid meetings.
- (vi) Assist the international electrical specialist in evaluating bids received.
- (vii) Assist the international electrical specialist in monitor implementation of the electrical component, ensuring all approvals are obtained by contractors from authorities.

**e. Auxiliary Plant Specialist**

19. A total of 7 person months of national consultant services will be required. The consultant will have a degree in mechanical engineering or equivalent and have good experience in design and installation of oil supply system, ash handling plant, electrostatic precipitator, limestone supply system, workshop equipment and laboratory equipment at coal power plants in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international auxiliary specialist develop a basic design of the auxiliary plant (balance of plant, workshop and laboratory equipment) from feasibility-level designs and in discussion with EA.
- (iii) Assist the international auxiliary plant specialist prepare technical specifications for the auxiliary plant.
- (iv) Assist the international auxiliary plant specialist prepare evaluation criteria.
- (v) Assist the international auxiliary specialist in responding to questions from prospective bidders during prebid meetings.
- (vi) Assist the international auxiliary specialist in evaluating bids received.

**f. Instrumentation and control specialist**

20. A total of 4 person months of national consultant services will be required. The consultant will have a degree in electrical engineering or equivalent and have good experience in design and installation of control and instrumentation systems at coal fired power stations in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Assist the international instrumentation and control specialist in developing a basic design of the plant and equipment from feasibility-level designs and in discussion with EA.
- (iii) Assist the international instrumentation and control specialist in preparing technical specifications for the instrumentation and control system.

- (iv) Assist the international instrumentation and control specialist in preparing the evaluation criteria.
- (v) Assist the international instrumentation and control specialist in responding to questions from prospective bidders during prebid meetings.
- (vi) Assist the international instrumentation and control specialist in evaluating the bids received..

**g. Procurement Specialist**

21. A total of 9 person months of national consultant services will be required. The consultant will have a degree in engineering or equivalent and have good experience in procurement for coal fired power stations in Viet Nam.

The consultant shall provide the following services:

- (i) Review the IS.
- (ii) Study the ADB's *Guidelines for Procurement* and the ADB approved procurement methodology for the EPC contract.
- (iii) Assist the international procurement specialist in discussions with EA regarding the ADB's procurement guidelines and assist in establishing a methodology and time line for the EPC package taking into account the program schedules for Parts 1 and 2.
- (iv) Assist the international procurement specialist in preparing the EPC bid documents incorporating commercial conditions and technical specifications taking care to ensure uniformity in requirements, completeness, timeliness and sequencing of bidding to maintain effective information flow.
- (v) Assist in evaluation of bids received in accordance with evaluation criteria developed.

**D. Resettlement Management**

22. One international resettlement specialist for 7 months and one national resettlement specialist for 45 months will be required. A national gender specialist will be engaged for 12 months to assist with gender issues. The tasks will be divided as appropriate according to relative experience and time allocated to work on the Project. Capacity building will be provided by the consultant to all members of the Project Team. Under this component, the consultant, together with TPPMU1 and Resettlement Committees, will be tasked to perform the following activities:

- (i) Prepare, update, implement, and monitor implementation of the RP.
- (ii) Implement consultation programs, information campaigns and stakeholder participation
- (iii) Establish and implement procedures to minimize adverse social impacts from land acquisition and loss of other assets throughout the planning, design and implementation phases.
- (iv) Establish and implement procedures for undertaking and completing census, detailed measurement and replacement cost surveys.
- (v) Establish and implement procedures for the coordination of resettlement and compensation activities on the various project related sites.

- (vi) Design and implement detailed income restoration programs for vulnerable and severely affected by loss of income (i.e. by loss of business, loss of job or loss of more than 10% of household income generating assets from affected agricultural, aquaculture or forestry land).
- (vii) Supervise implementation of rehabilitation measures and activities by the TPPMU1, through establishing links with other stakeholders and involvement of social organizations.
- (viii) Establish and implement procedures for tracking compliance with Project policies.
- (ix) Establish and implement of procedures for the involvement of social organizations in the grievance mechanisms and for prompt implementation of corrective actions and the resolution of grievances.
- (x) Establish and implement of liaison mechanisms to ensure proper technical and logistical support to TPPMU1, Project Managers, teams, and resettlement committees.
- (xi) Establish and implement procedures for ongoing internal monitoring.
- (xii) Supervise external monitoring activities and ensuring that the Terms of Reference are properly and effectively achieved.
- (xiii) Provide formal and on-the-job training for all TPPMU1, resettlement committees, external monitoring agency and other members of the project team related to resettlement, social preparation, social impact/assessment, gender, ethnic minorities and social development.
- (xiv) Provide training sessions on policies, procedures and best practices related to resettlement, social preparation, social impact/assessment, gender, ethnic minorities and social development; social assessment methodologies, stakeholder analysis, Participatory Rapid Appraisal, Participatory Monitoring and Evaluation and basic social research methodologies.
- (xv) Develop and implement capacity building strategy for TPPMU1, PRCs and DRCs to sustain and coordinate all resettlement, social impact/assessment, gender, ethnic minorities and social development-related activities.
- (xvi) Follow up of workers to ensure that they have they been reemployed by their existing employer, if not, ensure that they are entitled to the income restoration program.
- (xvii) Assist EVN/TPPMU1/Local Authorities in the final choice and design of the Workers Site and Resettlement Site.
- (xviii) Work closely with the environmental specialist with regard to impacts on fisheries and prepare an income restoration program for affected fisher-folks.
- (xix) Work with project consultants and PECC1, during detailed design, to provide access to Binh Minh and Duc Trung Companies in order for these companies to continue their activities.

## **E. Gender and Health**

23. One national consultant on gender and development will be recruited for 12 person months to assist EVN in operationalizing the gender strategy into an Action Plan included in the Summary of Poverty and Social Strategy (SPRSS, Appendix 8 of the Report and Recommendation for the President) during the project implementation. The consultant will be required to:

- (i) Conduct workshop for the local resettlement committee members, AP households to discuss resettlement activities related to compensation, implementation of resettlement activities, deployment of workers those lost job;
- (ii) Coordinate with Environmental consultant team and conduct workshop with the AP households, fisherfolk to discuss environmental impact of the project on fisheries, mangroves and other marine aquatic resources;
- (iii) Conduct capacity building training for the resettlement committees, AP households at village, commune and district level for effective implementation of resettlement plan, Environment Management Plan;
- (iv) Conduct gender sensitization training for implementation of resettlement plan for EVN, TPPMU1;
- (v) Discuss with District and Commune level resettlement committees to establish appropriate mechanisms for consultation and grievance process for the women from the affected households and women workers;
- (vi) ensure that HIV/AIDS and trafficking awareness campaign involve women's union, youth union, health workers, women community leaders;
- (vii) Coordinate with Occupational Health and Safety Specialist and assist to design gender based occupational and safety management system;
- (viii) Ensure for construction work, no differential wages paid to men and women for work for equal value;
- (ix) develop disaggregated monitoring indicators by gender and various ethnic groups;
- (x) conduct periodic field visits and prepare report on the implementation of gender and social issues.

24. One national consultant on Occupational Health and Safety will be recruited for 24 person months to work with Executing Agency in developing an Occupational Health and Safety Management System (OHSMS) compliance with Vietnamese standard. The objective of the Occupational Health and Safety Plan is to ensure that the Project has incorporated measures which will:

- (i) provide protective equipment as a standard practice;
- (ii) provide equipment to minimize pollution and air quality;
- (iii) reduce pollution level from coal dust during transportation of coal;
- (iv) provide enough protection equipment for the workers to decrease the risk of causing accidents;
- (v) provide safety protection equipment such as helmets, shoe, glasses, gloves, ear muffs etc.;
- (vi) use warning sign in the risk areas;
- (vii) hazardous free working condition in the plant;
- (viii) prevent respiratory diseases;
- (ix) follow Government's regulations on occupational health and safety standard; (ix) provide occupational health and safety awareness program and training to the men and women employees;
- (x) establish Health and Safety Committee with representatives from men and women employees
- (xi) establish community level health and safety committee in the towns. The

consultant will do an assessment of the occupational health and safety standard is included in implementing the Project as well as the potential impact on health of the workers and people living in around the plant site and towns through which coal is transported. Based on the assessment Occupational Health and Safety Management System will be designed within the context of Viet Nam.

## F. Environmental Management

25. An Environmental Impact Assessment (EIA), incorporating a comprehensive Environmental Management and Monitoring Plan (EMMP) has been prepared for the Project. A team of environmental monitoring consultants is required to assist TPPMU1 and AES to monitor implementation of the EMMP and the environmental effects of the project during the pre-construction and construction activities. The objectives of this Terms of Reference (TOR) are as follows:

- (i) Establish an Environmental Monitoring Consultant (EMC) Team comprising of international and national environmental monitoring specialists for a period of approximately 5 years throughout the pre-construction and construction stages of the Project
- (ii) Establish and implement a detailed environmental monitoring program based on the requirements of the EIA/EMMP to monitor: (i) EMMP implementation; and (ii) project environmental performance
- (iii) Undertake regular reporting on the results of the environmental monitoring program and make recommendations for corrective action as required

26. The EMC team will comprise international and national environmental monitoring specialists. The team will be led by an international consultant with the qualifications described in the following section. The team leader will be supported by national technical experts across a range of disciplines.

27. The EMC team will be required to liaise closely with project stakeholders including TPPMU1, AES, ADB, and GOV agencies including DONRE and MONRE.

28. The following personnel and qualifications will form part of the EMC team.

Personnel	Required Qualifications
International EMC Team Leader	<ul style="list-style-type: none"> <li>• Academic qualifications and at least 10 years experience in environmental management and monitoring</li> <li>• Demonstrated experience in implementation and supervision of EMPs for major infrastructure projects, including thermal power plants</li> <li>• Experience in leading multidisciplinary teams</li> <li>• Experience in Vietnam desirable</li> <li>• Fluent English written and spoken language</li> </ul>
National Water Quality Specialist	<ul style="list-style-type: none"> <li>• Relevant academic qualifications and at least 10 years experience in designing and implementing surface water and groundwater quality monitoring programs</li> <li>• Previous experience in environmental monitoring for thermal power plants desirable</li> <li>• Ability to communicate in English</li> </ul>

<b>Personnel</b>	<b>Required Qualifications</b>
National Air and Noise Quality Specialist	<ul style="list-style-type: none"> <li>• Relevant academic qualifications and at least 10 years experience in designing and implementing surface noise and air quality monitoring programs</li> <li>• Previous experience in environmental monitoring for thermal power plants desirable</li> <li>• Ability to communicate in English</li> </ul>
National Mangrove and Terrestrial Ecology Specialist	<ul style="list-style-type: none"> <li>• Relevant academic qualifications and at least 10 years experience in designing and implementing mangrove and terrestrial ecology monitoring programs</li> <li>• Ability to communicate in English</li> </ul>
National Environmental Monitoring Specialist	<ul style="list-style-type: none"> <li>• Relevant academic qualifications and at least 5 years experience in designing and implementing environmental monitoring programs for construction of major infrastructure projects</li> <li>• Familiarity with thermal power plant construction activities</li> <li>• Ability to communicate in English</li> </ul>

29. The major tasks and level of effort for each of the EMC team members are as follows.

<b>Personnel</b>	<b>Major Tasks</b>	<b>Level of Effort</b>
International EMC Team Leader	<ul style="list-style-type: none"> <li>• Coordinate EMC Team members</li> <li>• Ultimate responsibility for EMC Team outputs</li> <li>• Provide advice to EMC Team members on design of detailed monitoring programs</li> <li>• Review technical inputs from EMC Team members and provide advice on data analysis and reporting</li> <li>• Coordination of reporting at regular intervals on environmental monitoring results</li> <li>• Liaison with TPPMU1, AES on regular basis</li> <li>• Liaison with MONRE, DONRE and other stakeholders as required</li> <li>• Overall EMC Team budget management</li> </ul>	<ul style="list-style-type: none"> <li>• 20 months over 5 years (approximately 1 month every quarter)</li> </ul>
National Water Quality Specialist	<ul style="list-style-type: none"> <li>• Develop detailed environmental monitoring program for surface and groundwater quality based on Project EMMP requirements</li> <li>• Liaise with DONRE or other water quality analysis laboratories to carry out sampling and analysis on quarterly basis</li> <li>• Report results including discussion of unexpected results and recommendations for corrective action as required</li> </ul>	<ul style="list-style-type: none"> <li>• 20 months (approximately 1 month every quarter)</li> </ul>
National Air and Noise Quality Specialist	<ul style="list-style-type: none"> <li>• Develop detailed environmental monitoring program for air and noise quality based on Project EMMP requirements</li> <li>• Liaise with DONRE or other laboratories to carry out sampling and analysis on regular basis as required by the EMMP</li> <li>• Report results including discussion of unexpected results and recommendations for corrective action as required</li> </ul>	<ul style="list-style-type: none"> <li>• 10 months (approximately 0.5 month every quarter)</li> </ul>

Personnel	Major Tasks	Level of Effort
National Mangrove and Terrestrial Ecology Specialist	<ul style="list-style-type: none"> <li>• Develop detailed environmental monitoring program for mangrove replanting areas and vegetation management on project site based on Project EMMP requirements</li> <li>• Coordinate team of field ecologists, including staff from Bai Tu Long National Park, to carry out monitoring work</li> <li>• Report results including discussion of unexpected results and recommendations for corrective action as required</li> </ul>	<ul style="list-style-type: none"> <li>• 20 months (approximately 1 month every quarter)</li> </ul>
National Environmental Monitoring Specialist	<ul style="list-style-type: none"> <li>• Carry out regular monitoring of project site to check implementation of EMMP against document project performance monitoring indicators</li> <li>• Carry out observation based monitoring of environmental effects monitoring indicators contained in the EMMP and not included in scope of work for other EMC Team members</li> <li>• Report results including discussion of unexpected results and recommendations for corrective action as required</li> </ul>	<ul style="list-style-type: none"> <li>• 30 months (approximately 0.5 month every month)</li> </ul>

30. The EMC team will operate throughout the pre-construction and construction stages of the project, a period of approximately 5 years generally between 2007 and mid-2011.<sup>1</sup>

<sup>1</sup> A detailed implementation schedule will need to be included in the final version of the TOR