

**REQUEST FOR PROPOSALS**

**FEASIBILITY STUDY FOR THE**

**CONCENTRATED SOLAR POWER PLANT**

**Submission Deadline: 4:00 PM LOCAL JORDANIAN TIME**  
**NOVEMBER 19, 2009**

**Submission Place: Mr. Hisham Mikhi**  
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**SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.**

**Any and all questions pertaining to the content of the RFP should be sent to John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009.**

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- ANNEX 3 USTDA NATIONALITY REQUIREMENTS
- ANNEX 4 USTDA GRANT AGREEMENT, INCLUDING MANDATORY CONTRACT CLAUSES
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## Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US\$738,492 to Millennium Energy Industries, also known as International for Energy Technology Industries (the "Grantee") in accordance with a grant agreement dated September 26, 2009 (the "Grant Agreement"). The objective of the Study in Jordan ("Host Country") is to examine the feasibility of a Concentrated Solar Power (CSP) project based on power plant technology supplied by eSolar, Inc. (eSolar). It is anticipated that the implementation of engineering, procurement and construction will be done in a phased approach that may include a 5 MW demonstration project, followed by a separate and independent 46 MW project or multiple projects, collectively known as "the Ma'an Project."

The Grant Agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to perform the Feasibility Study.

### 1.1 BACKGROUND SUMMARY

The Study will include eSolar technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, permitting assistance and project implementation planning. The Grantee has already chosen a site in the Ma'an Industrial Estate for the planned facility but requires further guidance on site assessment.

The Grantee shall provide project management support, local project implementation information (such as the provision of information, data and material, the coordination of meetings, the provision of information pertaining to project costs and site conditions, facilitation of meetings, and the provision of information relating to financing market opportunities) and assist in obtaining necessary information from eSolar.

As described in the Terms of Reference, the Study will include a detailed review of portions of the Front End Engineering Package (FEED) for eSolar's modular design of a standard 46 MW CSP project. The portions that will be analyzed under this Study include the Preliminary Design Package and the Cost, Schedule, and Risk Assessment. These documents will be supplied by eSolar to the Grantee and the Contractor during the course of the Study. The FEED is being conducted by Fluor and is scheduled to be completed by late 2009. **Fluor will not bid on this USTDA-funded Study.** Portions of the background Definitional Mission is provided for reference in Annex 2.

### 1.2 OBJECTIVE

The objective of the project is to produce a bankable document so that the Grantee can move ahead with the solar power facility in Ma'an. This project is time sensitive. Timely completion of the tasks is necessary for the success of the project. The Terms of Reference (TOR) for this Feasibility Study are attached as Annex 5.

### 1.3 PROPOSALS TO BE SUBMITTED

Technical proposals are solicited from interested and qualified U.S. firms. **As indicated in section 1.1, Fluor will not bid on this Study.** The administrative and technical requirements as detailed throughout the Request for Proposals (RFP) will apply. Specific proposal format and content requirements are detailed in Section 3.

The amount for the contract has been established by a USTDA grant of US\$738,492. **The USTDA grant of \$US738,492 is a fixed amount. Accordingly, COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted.** Upon detailed evaluation of technical proposals, the Grantee shall select one firm for contract negotiations.

### 1.4 CONTRACT FUNDED BY USTDA

In accordance with the terms and conditions of the Grant Agreement, USTDA has provided a grant in the amount of US\$738,492 to the Grantee. The funding provided under the Grant Agreement shall be used to fund the costs of the contract between the Grantee and the U.S. firm selected by the Grantee to perform the TOR. The contract must include certain USTDA Mandatory Contract Clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA Mandatory Contract Clauses are attached at Annexes 3 and 4, respectively, for reference.

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support. In addition to the USTDA funding provided under this Grant Agreement, the Grantee agrees that it shall provide US\$124,800 worth of in-kind costs to contribute to the costs of goods and services required for the completion of the Study (the "Grantee Cost Share"). The Grantee Cost Share shall be specified in the Contract between the Grantee and the Contractor and shall include, but not be limited to, the provision of the following: project management support; relevant local data and information such as information pertaining to legal and regulatory requirements, information pertaining to financing market opportunities, and information pertaining to Project costs and site conditions; facilitation and coordination of meetings in Jordan; and assisting with obtaining any required information from eSolar.

In addition to the USTDA Grant funds provided, by providing the Technical and Engineering Data, eSolar shall, between it and/or its subcontractors, cover at least US\$802,000 of costs to complete the full Terms of Reference (the "Cost Share").

## **Section 2: INSTRUCTIONS TO OFFERORS**

### **2.1 PROJECT TITLE**

The project is called Concentrated Solar Power Plant.

### **2.2 DEFINITIONS**

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal, including qualifications statement.

The term "Offeror" means the U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

### **2.3 DEFINITIONAL MISSION REPORT**

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. An abridged copy of the report is attached at Annex 2 for background information only. Please note that the TOR referenced in the report are included in this RFP as Annex 5.

### **2.4 EXAMINATION OF DOCUMENTS**

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Feasibility Study.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution and completion of the Feasibility Study.

## **2.5 PROJECT FUNDING SOURCE**

The Feasibility Study will be funded under a grant from USTDA. The total amount of the grant is not to exceed US\$738,492. The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support. In addition to the USTDA funding provided under this Grant Agreement, the Grantee agrees that it shall provide US\$124,800 worth of in-kind costs to contribute to the costs of goods and services required for the completion of the Study (the "Grantee Cost Share"). The Grantee Cost Share shall be specified in the Contract between the Grantee and the Contractor and shall include, but not be limited to, the provision of the following: project management support; relevant local data and information such as information pertaining to legal and regulatory requirements, information pertaining to financing market opportunities, and information pertaining to Project costs and site conditions; facilitation and coordination of meetings in Jordan; and assisting with obtaining any required information from eSolar.

In addition to the USTDA funding provided under this Agreement and Grantee Cost Share, eSolar shall be responsible for ensuring that the Contractor and/or its subcontractors cover at least US \$802,000 of costs to complete the full Terms of Reference.

## **2.6 RESPONSIBILITY FOR COSTS**

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal. Neither USTDA nor the Grantee assumes any obligation as a result of the issuance of this RFP, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, final selection or negotiation of a contract.

## **2.7 TAXES**

Offerors should submit proposals that note that in accordance with the USTDA Mandatory Contract Clauses, USTDA grant funds shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in the Host Country.

## **2.8 CONFIDENTIALITY**

The Grantee will preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror, to the extent permitted by the laws of the Host Country.

## **2.9 ECONOMY OF PROPOSALS**

Proposal documents should be prepared simply and economically, providing a comprehensive yet concise description of the Offeror's capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

## **2.10 OFFEROR CERTIFICATIONS**

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from submitting a proposal; and (d) that it has not sought by collusion to obtain for itself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof.

## **2.11 CONDITIONS REQUIRED FOR PARTICIPATION**

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from the Host Country for up to 20 percent of the amount of the USTDA grant for specific services from the TOR identified in the subcontract. USTDA's nationality requirements, including definitions, are detailed in Annex 3. Refer to Section 1.4 of this RFP for additional information on the applicability of USTDA's Nationality Requirements. The US Contractor will be required to sign a confidentiality agreement with both technology provider and the Grantee.

## **2.12 LANGUAGE OF PROPOSAL**

All proposal documents shall be prepared and submitted in English, and only English.

## **2.13 PROPOSAL SUBMISSION REQUIREMENTS**

The **Cover Letter** in the proposal must be addressed to:

Mr. Hisham Mikhi  
International for Energy Technology Industries  
P.O. Box 930 Amman 11821 Jordan  
[Hishamm@millenniumenergy.co.uk](mailto:Hishamm@millenniumenergy.co.uk)  
Cc: [Shukrih@millenniumenergy.co.uk](mailto:Shukrih@millenniumenergy.co.uk)

**An Original and three (3) copies of your proposal must be received at the above address no later than 4:00 pm on November 19, 2009.**

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened. The Grantee will promptly notify any Offeror if its proposal was received late.

Upon timely receipt, all proposals become the property of the Grantee.

## **2.14 PACKAGING**

The original and each copy of the proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and three (3) copies should be collectively wrapped and sealed, and clearly labeled.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly wrapped, sealed and labeled.

Proposals may be submitted electronically to [Hishamm@millenniumenergy.co.uk](mailto:Hishamm@millenniumenergy.co.uk) with a cc to [shukrih@millenniumenergy.co.uk](mailto:shukrih@millenniumenergy.co.uk).

## **2.15 AUTHORIZED SIGNATURE**

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror.

## **2.16 EFFECTIVE PERIOD OF PROPOSAL**

The proposal shall be binding upon the Offeror for SIXTY days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

## **2.17 EXCEPTIONS**

All Offerors agree by their response to this RFP announcement to abide by the procedures set forth herein. No exceptions shall be permitted.

## **2.18 OFFEROR QUALIFICATIONS**

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory, feasibility study and/or other services similar to those required in the TOR, as applicable.

**As indicated in section 1.1, Fluor will not bid on this Study.**

## **2.19 RIGHT TO REJECT PROPOSALS**

The Grantee reserves the right to reject any and all proposals.

## **2.20 PRIME CONTRACTOR RESPONSIBILITY**

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of any subcontractors. USTDA nationality provisions apply to the use of subcontractors and are set forth in detail in Annex 3. The successful Offeror shall

cause appropriate provisions of its contract, including all of the applicable USTDA Mandatory Contract Clauses, to be inserted in any subcontract funded or partially funded by USTDA grant funds. For a list of potential host country subcontractors, please contact the commercial service in Amman; contact information can be found here: <http://www.buyusa.gov/jordan/en/>

## **2.21 AWARD**

The Grantee shall make an award resulting from this RFP to the best qualified Offeror, on the basis of the evaluation factors set forth herein. The Grantee reserves the right to reject any and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP.

## **2.22 COMPLETE SERVICES**

The successful Offeror shall be required to (a) provide local transportation, office space and secretarial support required to perform the TOR if such support is not provided by the Grantee; (b) provide and perform all necessary labor, supervision and services; and (c) in accordance with best technical and business practice, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete the TOR to the satisfaction of the Grantee and USTDA.

## **2.23 INVOICING AND PAYMENT**

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in the contract. After the Grantee's approval of each invoice, the Grantee will forward the invoice to USTDA. If all of the requirements of USTDA's Mandatory Contract Clauses are met, USTDA shall make its respective disbursement of the grant funds directly to the U.S. firm in the United States. All payments by USTDA under the Grant Agreement will be made in U.S. currency. Detailed provisions with respect to invoicing and disbursement of grant funds are set forth in the USTDA Mandatory Contract Clauses attached in Annex 4.

### **Section 3: PROPOSAL FORMAT AND CONTENT**

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. A cost proposal is NOT required because the amount for the contract has been established by a USTDA grant of US\$738,492, which is a fixed amount.

Offerors shall submit one (1) original and three (3) copies of the proposal. Proposals may be submitted electronically to [Hishamm@millenniumenergy.co.uk](mailto:Hishamm@millenniumenergy.co.uk) with a cc to [shukrih@millenniumenergy.co.uk](mailto:shukrih@millenniumenergy.co.uk). Proposals received by fax cannot be accepted.

Each proposal must include the following:

- Transmittal Letter,
- Cover/Title Page,
- Table of Contents,
- Executive Summary,
- Company Information,
- Organizational Structure, Management Plan, and Key Personnel,
- Technical Approach and Work Plan, and
- Experience and Qualifications.

Detailed requirements and directions for the preparation of the proposal are presented below.

#### **3.1 EXECUTIVE SUMMARY**

An Executive Summary should be prepared describing the major elements of the proposal, including any conclusions, assumptions, and general recommendations the Offeror desires to make. Offerors are requested to make every effort to limit the length of the Executive Summary to no more than five (5) pages.

## **3.2 COMPANY INFORMATION**

For convenience, the information required in this Section 3.2 may be submitted in the form attached in Annex 6 hereto.

### **3.2.1 Company Profile**

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers.
2. Year established (include predecessor companies and year(s) established, if appropriate).
3. Type of ownership (e.g. public, private or closely held).
4. If private or closely held company, provide list of shareholders and the percentage of their ownership.
5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (\*) next to the names of those principal officers who will be involved in the Feasibility Study.
6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror's parent(s).
7. Project Manager's name, address, telephone number, e-mail address and fax number.

### **3.2.2 Offeror's Authorized Negotiator**

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

### **3.2.3 Negotiation Prerequisites**

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and reflect such impact within the project schedule.
2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

### 3.2.4 Offeror's Representations

If any of the following representations cannot be made, or if there are exceptions, the Offeror must provide an explanation.

1. Offeror is a corporation [*insert applicable type of entity if not a corporation*] duly organized, validly existing and in good standing under the laws of the State of \_\_\_\_\_. The Offeror has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Offeror is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment, or ineligible for the award of contracts by any federal or state governmental agency or authority. The Offeror has included, with this proposal, a certified copy of its Articles of Incorporation, and a certificate of good standing issued within one month of the date of its proposal by the State of \_\_\_\_\_.
2. Neither the Offeror nor any of its principal officers have, within the three-year period preceding this RFP, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.
3. Neither the Offeror, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.
4. There are no federal or state tax liens pending against the assets, property or business of the Offeror. The Offeror, has not, within the three-year period preceding this RFP, been notified of any delinquent federal or state taxes in an amount that exceeds \$3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.
5. The Offeror has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Offeror has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA retains the right to request an updated certificate of good standing from the selected Offeror.

### **3.3 ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL**

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Feasibility Study. Identify the Project Manager who will be the individual responsible for this project. The Project Manager shall have the responsibility and authority to act on behalf of the Offeror in all matters related to the Feasibility Study.

Provide a listing of personnel (including subcontractors) to be engaged in the project, including both U.S. and local subcontractors, with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the Offeror shall describe the organizational relationship, if any, between the Offeror and the subcontractor.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Technical Approach and Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

### **3.4 TECHNICAL APPROACH AND WORK PLAN**

Describe in detail the proposed Technical Approach and Work Plan (the "Work Plan"). Discuss the Offeror's methodology for completing the project requirements. Include a brief narrative of the Offeror's methodology for completing the tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Work Plan, and previous project experience, describe any support that the Offeror will require from the Grantee. Detail the amount of staff time required by the Grantee or other participating agencies and any work space or facilities needed to complete the Feasibility Study.

### **3.5 EXPERIENCE AND QUALIFICATIONS**

Provide a discussion of the Offeror's experience and qualifications that are relevant to the objectives and TOR for the Feasibility Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. The Offeror shall provide information with respect to relevant experience and qualifications of key staff proposed. The Offeror shall include letters of commitment from the individuals proposed confirming their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided for each of the Offeror and any subcontractor, including the following information:

Project name,  
 Name and address of client (indicate if joint venture),  
 Client contact person (name/ position/ current phone and fax numbers),  
 Period of Contract,  
 Description of services provided,  
 Dollar amount of Contract, and  
 Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Feasibility Study as described in this RFP.

**Section 4: AWARD CRITERIA**

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors. The Grantee will notify USTDA of the best qualified Offeror, and upon receipt of USTDA's no-objection letter, the Grantee shall promptly notify all Offerors of the award and negotiate a contract with the best qualified Offeror. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations may then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

	<b>Maximum Points</b>
1. General Experience and Qualifications	
1.1 Overall experience of the firm	3
1.2 Overseas experience	3
1.3 Experience in Arab countries and ability to maximize leverage Host Country subcontractors and resources	4
2. Specific Applicable Experience, specifically experience in project development, first of a kind technology due diligence, steam handling and power generation, power sector supplier relationships, renewable and solar energy projects, techno-economic feasibility studies, financial modeling cost estimation.	20
3. Approach and Methodology	

3.1 Knowledge of proposed work and understanding of the services to be performed as demonstrated by the specific details of the firm's proposal	15
3.2 Appropriateness of the proposed methodology work plan and schedule, highlighting the need to implement the study within a short time period of four to six months	15
3.3 Quality and detail of Contractor's committed deliverables in light of the limited project budget and requirements, noting critical elements include cost estimate accuracy level and localization approach, financing documentation, and "bankable" study components.	15
4. Qualifications of Proposed Key Personnel	
4.1 Qualifications of project leader	15
4.2 Qualifications of other team professionals	10
<b>Total</b>	<b>100</b>

The US Contractor will be required to sign a confidentiality agreement with both technology provider and the Grantee.

Proposals that do not include all requested information may be considered non-responsive.

Price will not be a factor in contractor selection.

**ANNEX 1**

Mr. Hisham Mikhi  
International for Energy Technology Industries  
P.O. Box 930 Amman 11821 Jordan  
Phone: +962 6 585 5533  
Fax: + 962 6 581 3753  
Hishamm@millenniumenergy.co.uk  
Cc: shukrih@millenniumenergy.co.uk

#### Concentrated Solar Power Plant

POC: John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Concentrated Solar Power Plant. The Grantee invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms that are qualified on the basis of experience and capability to develop a feasibility study for concentrated solar power plant based on the technology of eSolar, Inc.

The Grantee, Millennium Energy Industries, also known as International for Energy Technology Industries, is a Jordan based international solar energy solutions company operating in the Middle East North Africa region.

The objective of the Study is to examine the feasibility of a Concentrated Solar Power project based on power plant technology supplied by eSolar, Inc. It is anticipated that the implementation of engineering, procurement and construction will be done in a phased approach, including initially a 5 MW demonstration project, followed by a separate and independent 46 MW project or multiple projects, collectively known as "the Ma'an Project."

The Study will include eSolar technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, permitting assistance and project implementation planning. The Grantee has already chosen a site in the Ma'an Industrial Estate for the planned facility but requires further guidance on site assessment.

The U.S. firm selected will be paid in U.S. dollars from a \$738,492 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission/desk study report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to: <https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp>. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to

retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA. Any and all questions regarding this announcement should be sent to John Kusnierek at the above address and telephone number.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

Interested U.S. firms should submit their Proposal in English directly to the Grantee by November 19, 2009 at the above address. Proposals may be submitted electronically to [Hishamm@millenniumenergy.co.uk](mailto:Hishamm@millenniumenergy.co.uk). Evaluation criteria for the Proposal are included in the RFP. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals.

**ANNEX 2**

**DEFINITIONAL MISSION FOR RENEWABLE POWER PROJECTS IN JORDAN**

**FINAL REPORT**

**Submitted To:**

**U.S. Trade and Development Agency  
1000 Wilson Boulevard, Suite 1600  
Arlington, VA 22209  
Telephone: (703) 875-4357**

**Submitted By:**

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**August 2009**



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The U.S. Trade and Development Agency (USTDA) advances economic development and U.S commercial interests in developing and middle income countries. The agency funds various forms of technical assistance, feasibility studies, training, orientation visits and business workshops that support the development of a modern infrastructure and a fair and open trading environment.

USTDA's strategic use of foreign assistance funds to support sound investment policy and decision-making in host countries creates an enabling environment for trade, investment and sustainable economic development. Operating at the nexus of foreign policy and commerce, USTDA is uniquely positioned to work with U.S. firms and host countries in achieving the agency's trade and development goals. In carrying out its mission, USTDA gives emphasis to economic sectors that may benefit from U.S. exports of goods and services.

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## 1.0 EXECUTIVE SUMMARY

Jordan lies in the heart of Middle East, which is politically fragile and has been a critical region of the world for the last five decades or more. Compared with neighboring Arab countries, Jordan is also poor in terms of natural resources, including energy. Furthermore, its economy is vulnerable and depends heavily on the political situation in the region. The net effect of these factors is a national energy demand that has rapidly grown, and is expected to continue growing, especially if there is a long lasting settlement for the current political crisis in the region, which is deemed to bring stability and prosperity within the region.

In order to meet the growing energy demand resulting from the significant growth in past decades, large investments are required for developing energy supply. This includes petroleum refining, storage and distribution, as well as increasing the capacity of power generation and the electricity distribution network. But such capital has not been forthcoming at the desired pace and is often not available. Although meeting the national energy demand is very important, effective utilization of Jordan's potential energy and indigenous resources is also critical and essential.

In 2005, Jordan produced 290,000 tons of oil equivalent (TOE) from its local primary energy resources, but consumed about 7 million TOE. Of this, imported oil and gas accounted for nearly 95%, natural gas accounted for about 4%, while renewable sources accounted for 1% only.

To meet the energy demand and the challenges of the energy sector, a comprehensive National Energy Strategy for the period of 2005-2015 was approved in 2004 and later updated in 2007. It provided a vision for the development of energy sector over the next ten years. The strategy analyzed all options and alternatives for securing all types of energy to cope with the energy demands and its investment cost, and to reforming and restructuring the energy sector to open the market for competition. The main goals of the National Energy Policy include development of local energy resources (e.g., natural gas, oil shale, solar and wind energy), penetration of new energy forms in the final consumption, participation of private sector in the energy sector through attracting investments to exploration zones in Jordan, improvement of efficiency in both energy and demand system, introduction of competition through liberalization, and tariff development.

Regarding the production of electricity, the enactment of the General Electricity Law has helped support Independent Power Producers (IPP's) and the attraction of IPP investments to supply power into the regional market. It has also helped provide opportunities to developers to build, own, and operate private power plants to meet the growth in demand. Furthermore, national and foreign private entities are participating in the construction and operation of a high pressure natural gas pipeline. The Ministry of Energy and Mineral Resources (MoEMR) is also promoting renewable energy sources (RES) in the electricity generation sector mainly through private investment. The MoEMR has identified the need for projects in renewables with a total estimated cost of \$2.1 billion over the next 15 years.

USTDA has previously funded a number of energy related Definitional Missions and Technical Assistance programs. The most recent of which were an Electricity Loss Reduction Technical Assistance, a Feasibility Study for a 400 KV Line, and a Technical Assistance for Oil Shale Development. The Definitional Mission at hand constitutes a continuation of USTDA's support for the energy sector in Jordan. The Interdisciplinary Research Consultants-US (IdRC-US) was contracted to conduct this DM, and identify projects in the area of renewable energy. The DM Team was to identify project opportunities that represent developmental priorities for the Government of Jordan, and have the potential to increase US exports.

The IdRC-US DM Team deployed in Jordan in May 2008, where several meetings with relevant stakeholders were conducted. Several projects were identified and requested by the Government of Jordan; of those, one project was found to meet the USTDA project selection criteria. As a result, the DM Team recommended USTDA support for a Feasibility Study for Mini-Hydro and Pumped Storage Schemes. The main concept of the project is to utilize the various water reservoirs in Jordan (i.e., mainly dams) to pump water to higher elevations during the off-peak electricity demand period, and then use it to generate electricity during the peak demand periods. Such practice is common in several MENA countries especially Morocco. It helps reduce expenses incurred for electricity, which constitute a significant portion of water facilities' operating expenses. The study would address all water storage sites in Jordan, identify the ones with potential, and then prioritize them in a packaged implementation plan based on the potential savings and the amounts of electricity that could be generated.

The proposed project could result in significant US exports mainly in the form of pumps and turbines. More importantly, it will help US companies enter the Jordanian market, which is expected to hold significant investment opportunities in the energy sector. The proposed projects will open other future opportunities for US companies of

the sector. The proposed pumped storage scheme in Jordan also provides an excellent opportunity for US companies to invest as part of the GoJ's policy to increase sharing ratio of all available renewable energy sources into the national energy mix. Water turbines and pumping systems are basic keys to achieving such objectives. Some US manufacturers of such equipment have already established a presence in Jordan for the supply of different systems. These companies can play a significant role in the supply of necessary equipment for small hydro schemes. The DM Contractor has contacted several such US manufacturers and providers, and there was a noticeable interest on the behalf of some of those companies to increase their sales in the Mid-East Region. Major US Engineering companies also expressed interest in the Jordanian renewables sector as well.

It is believed that the Jordanian Free Trade Agreement with the US will facilitate the market entry for US products, and with the anticipated growth in the energy sector, specifically pumped storage and mini hydros, in Jordan, significant export opportunities will arise in the range of about \$40-50 million during the next decade. In addition to electricity generation at dam locations, a similar concept could be applied at waste water treatment plants (WWTPs). This has been successfully implemented at the Samra BOT project, and given the remaining 22 WWTPs in Jordan, there is further potential for US exports. In addition to electricity generation, such initiatives could be used for Carbon Trading as per the Kyoto agreement.

Towards the end of the DM, a Jordanian Company submitted an unsolicited proposal for a feasibility study for a solar power generation plant with a 46 Mega Watt capacity in southern Jordan. The project is to be implemented by Millennium Energy Industries (MEI) of Jordan, in cooperation with eSolar Inc. out of Pasadena, California. The project would be in the Ma'an Development Zone overseen by the Ma'an Development Corporation which is a governmental entity responsible for the implementation of the Master Plan for the Ma'an Special Development Zone. The Development Zones Initiative was launched in 2006 with the main purpose of reducing disparities between the governorates and the regions in the Kingdom, in order to ensure the distribution of development gains across the nation. Such zones are intended to create integrated areas for economic, scientific and social activities that build on the respective areas' competitive advantages.

The main theme of the proposed study is to conduct a detailed assessment to identify the specific needs of solar power facilities, taking into account different technologies, which could help in increasing dependence on free and clean source of solar energy that would relieve some of hard currency due to increasing expenditures on imported energy. The feasibility study will use the model for a 46 MW plant as developed by eSolar and apply the technology to the specific conditions in Ma'an.

The expected future solar power market in Jordan also provides an excellent opportunity for US companies to invest as part of the GoJ's policy to reduce dependence on imported energy. The PV and/or solar concentrators in a solar power system are basic keys to achieving such objectives. Some US Companies such as GE and AEE have already established a presence in Jordan for the supply of different systems. It is companies like those that can play a significant role in the supply of necessary equipment for the Jordanian solar power schemes. It is believed that the Jordanian Free Trade Agreement with the US will facilitate the market entry for US products, and with the anticipated growth in the energy sector, specifically solar power generation in Jordan, significant export opportunities will arise. It is estimated that the local market will absorb between \$30-60 million during the next 5-10 years.

## 2.0 BACKGROUND

Jordan lies in a politically fragile region that has been one of the most politically critical spots in the world for the last five decades or more. Compared with neighboring Arab countries, Jordan is also poor in terms of natural resources, including energy. Furthermore, its economy is fragile and depends heavily on the political situation in the region. The net effect of these factors is a national energy demand that has rapidly grown, and is expected to continue growing. Except for small amount of natural gas, almost all of the needed primary energy in Jordan is imported. This places a heavy burden on the national economy, with an energy bill of more than \$3 billion in 2006. Crude oil and some refined products are imported from neighboring Arab countries through Aqaba port, and then transported up-north to the only refinery in Zarqa. Natural gas comes in a pipeline, from Egypt and runs up to the Syrian border, which at present supplies main power stations.

In order to meet the growing energy demand, large investments are required in power generation. This includes petroleum refining, storage and distribution as well as increasing the capacity of power generation and the electricity distribution network. But such capital has not been forthcoming at the desired pace and is often not available at all. Although meeting the national energy demand via increasing the generation capacity is very important, effective utilization of Jordan's other potential energy resources is as critical and essential.

In 2005, Jordan produced 290,000 tons of oil equivalent (TOE) from its local primary energy resources, but consumed about 7 million TOE, of which imported oil and gas accounted for nearly 95%, and the remaining came from natural gas (4%), and renewable sources (1%). The annual imported energy bill was approximately \$2 billion, representing about 20% of Jordan's gross domestic product, about 24% of the total commodities imports; and 58% of the domestic commodities exports. The forecasts of concerned governmental institutions and independent researchers suggest that the primary energy demand in Jordan will be equivalent to 10 million TOE by the year 2015, and will double between 2015 and 2020. Table 2 below summarizes the MoEMR's Energy and Electricity Demand Forecast in Jordan. If the current sector policies and practices are unchanged, it is expected that energy production from national resources will not exceed 5% of the national demand in the year 2015. Hence, the country will still be forced to import most of its energy needs, unless there are large new crude oil and/or natural gas discoveries and production fields in the country, or increases in indigenous energy sources including renewables and oil shale are incorporated in the national energy mix.

Table 1. Jordan Energy Demand Forecast

Year	Primary Energy		Max. Demand		Electrical Energy	
	1000 TOE	Growth (%)	(MW)	Growth (%)	(GWh)	Growth (%)
2007	7394	2.9	2071	8.9	12847	10.3
2008	7608	2.9	2228	7.6	13794	7.4
2009	7836	3.0	2394	7.5	14790	7.2
2010	8079	3.1	2545	6.3	15819	7
2015	9459	3.2	3267	5.1	20105	4.9
2020	11125	3.3	3910	3.7	24164	3.7

Almost all electricity production in Jordan currently is carried out by the Central Electricity Generation Company (CEGCO) and Al-Samrah Electricity Company, both of which are state-owned utilities. The country's main power generation facilities are (1) the Hussein Thermal Power Plant at Zarqa with a capacity of about 400 MW, (2) the Aqaba Power Plant with a capacity of 650 MW, and (3) the Rishah Gas Turbine Plant with 5x30 MW gas turbines. Renewable energy power plants represent less than 0.7% of the total installed capacity; hydro power accounts for

10 MW, while wind turbines accounts for 1.5 MW only. Electricity harnessed via hydropower and wind turbines combined accounted for a very small percentage (nearly 0.6% of the total electricity generated annually).

The existing Jordanian national electrical network is composed of seven main power stations and 40 high voltage substations, which are dispersed across the Kingdom to ensure the supply of electrical energy to all consumers. Jordan is moving toward a pool model for the electricity market and the country is considered a main crossing point for a number of electrical interconnections in the future including (1) the seven member electric interconnection project (EIJLLST), which aims to connect the electrical networks of Egypt, Iraq, Jordan, Lebanon, Libya, Syria and Turkey; (2) the electrical Interconnection project of the Mediterranean countries (MEDRING); (3) the project of the Pan Arab Electrical Interconnection; and (4) the Regional Interconnection project (EIJP). USTDA has funded a feasibility study for a new 400 kV transmission line from Aqaba in the south of Jordan to the north-east, outside of Amman. This project is considered essential to reinforce the Jordanian network and permit it to participate in the above-mentioned interconnection projects. Preliminary feasibility studies were performed on the Jordanian national network and on the interconnected networks of the EIJJLLST countries.

These studies showed that there would be important improvements benefiting the Jordanian national electricity sector and interconnected networks from the addition of the proposed 400 kV line.

Electricity demand is growing, and the Jordanian government continues to seek ways to attract foreign capital to fund additional generation capacity. As a result, a paradigm shift is being developed in energy management at the national level. The previous dependence on foreign oil imports is coming to an end with a new package of legislative, administrative and technological innovations aiming to steer the country into more reliable, sustainable and even environmentally friendly energy resources.

The first landmark tool for the expected change in energy landscape is the newly released "National Energy Strategy" recently prepared by a Royal Committee and endorsed by King Abdullah II. The energy strategy seeks to increase dependence on local energy sources from the current 4%, to 25% by 2015, and up to 39% by 2020. This will be paralleled with a reduction in the energy produced from oil from a current 58%, to 40% in 2020.

The Strategy includes an objective to increase the percentage of renewable energy in national primary energy production from 1% now to 9% in 2020. This transition should be done through a package of investments estimated at US \$ 1.4- 2.2 billion. The investment package includes Build-Operate-Transfer (BOT) deals for wind energy with a total capacity of 660 MWs and solar energy innovations for 150 MW. However, the small value of solar energy proposals is really puzzling as the potential for solar energy is much more realistic and even technologically feasible than wind energy.

The strategy also includes other recommendations on energy conservation. This includes exemptions on energy-saving vehicles, exempting solar water heaters from sales tax, implementation of building code regulations that conserve energy, and creating a national award for rationalization of energy consumption. The strategy will be supported by a "Renewable Energy Law" that is currently in draft form and will most likely be issued as a temporary law (as indicated in the Strategy itself). The draft law includes regulations and incentives for renewable energy production.

Jordan has already pursued intensive programs for promoting renewable energy involving systematic monitoring of technological developments, implementation of appropriate know-how, and execution of demonstration and pilot projects. Projects and studies that have been accomplished in this field have provided Jordan with the know-how needed for entering a new phase of local manufacturing of renewable energy systems. This is especially true for wind turbines by means of cooperation and joint ventures between local institutions and foreign companies.

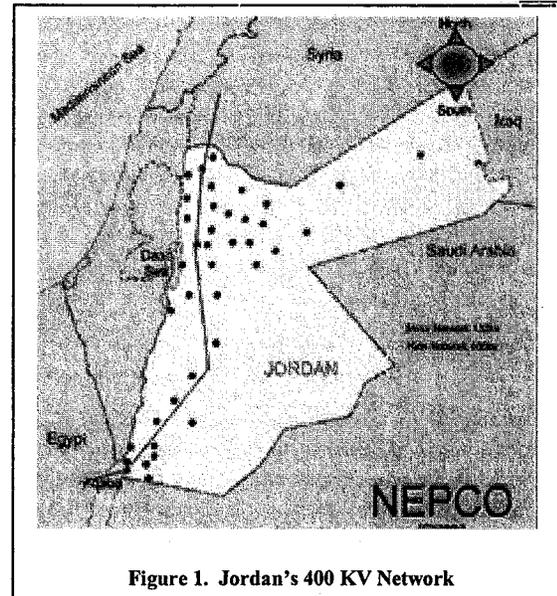


Figure 1. Jordan's 400 KV Network

In terms of non-traditional energy sources, Jordan has the potential of more than 1000 GWh/year of wind power, about 350 GWh/year of municipal waste and biomass, and abundant deposits of oil shale. Besides the limited amounts of natural gas, oil shale is the only fossil fuel resource available locally, with estimated reserves of about 40 billion tons. On average, its organic content is approximately 9-13% by weight. This is equivalent to about 4-5 billion TOE. In addition, there are some geothermal sources at certain locations, but their temperature is not high enough to be deployed for power generation. For all these reasons, the government of Jordan is paying considerable attention to new and renewable energy resources.

The Kingdom's National Energy Strategy, which has been recently updated, places more emphasis on the utilization of renewable energies in an attempt of reducing the country's reliance on the traditional energy sources, especially oil which is imported from neighboring countries.

## 2.1 SECTOR KEY PLAYERS

MoEMR is responsible for securing the country's energy needs from various foreign and indigenous sources. As part of this Definitional Mission, the study team coordinated with and interviewed various relevant agencies. Figure 2 below presents the MoEMR's organizational structure. As can be seen in the structure, there is a Directorate within the Ministry that solely deals with renewables. So far, the main concentration has been on wind energy and Jordan has come a long way in terms of wind farms that have mostly been implemented via Public Private Partnerships (PPPs) including BOT and BOO concessions.

The Directorate of Renewable Energy is now attempting to explore other renewable energy projects such as solar and waste to energy projects. Those initiatives, however, are still in their early stages. This further warrants USTDA involvement at an early stage, which will help facilitate the entry of US companies into the Jordanian market as such projects evolve.

The current institutional framework of the energy sector consists of the following entities/utilities:

### *Electricity Sub-sector*

- Electricity Sector Regulatory Commission (ESRC) is an independent commission established in 2001. It controls the electricity pricing policy, sets up the electricity tariff, and grants the licenses for generation and distribution of electrical power. In addition, it works to determine subscription and service fees, issuing licenses for generating and distribution companies, and monitoring performance of all working utilities in order to guarantee fair relation between all parties, i.e. consumers, generators and suppliers.
- National Electric Power Company (NEPCO), which is a public shareholding company, is owned by the government and is responsible for electric power transmission, bulk electric power sales, and interconnections with neighbouring countries.
- Jordan Electric Power Company (JEPCO) is a private entity, which distributes electricity in the middle region of Jordan.
- Irbid District Electricity Company (IDECO) is a private company with most of its shares owned by the public sector. It is responsible for electricity distribution in the northern governorates of Jordan. It undertakes some small-scale electric-power generation using diesel engines.
- Electricity Distribution Company (EDCO), which is responsible for electricity distribution outside the concession areas allocated to JEPCO and IDECO described above. It delivers in the Jordan valley, southern governorates, and the far eastern towns.
- Rural Electrification Project, which is mainly, concerned with financing rural electrification connections in remote areas. It is supervised directly by MoEMR.

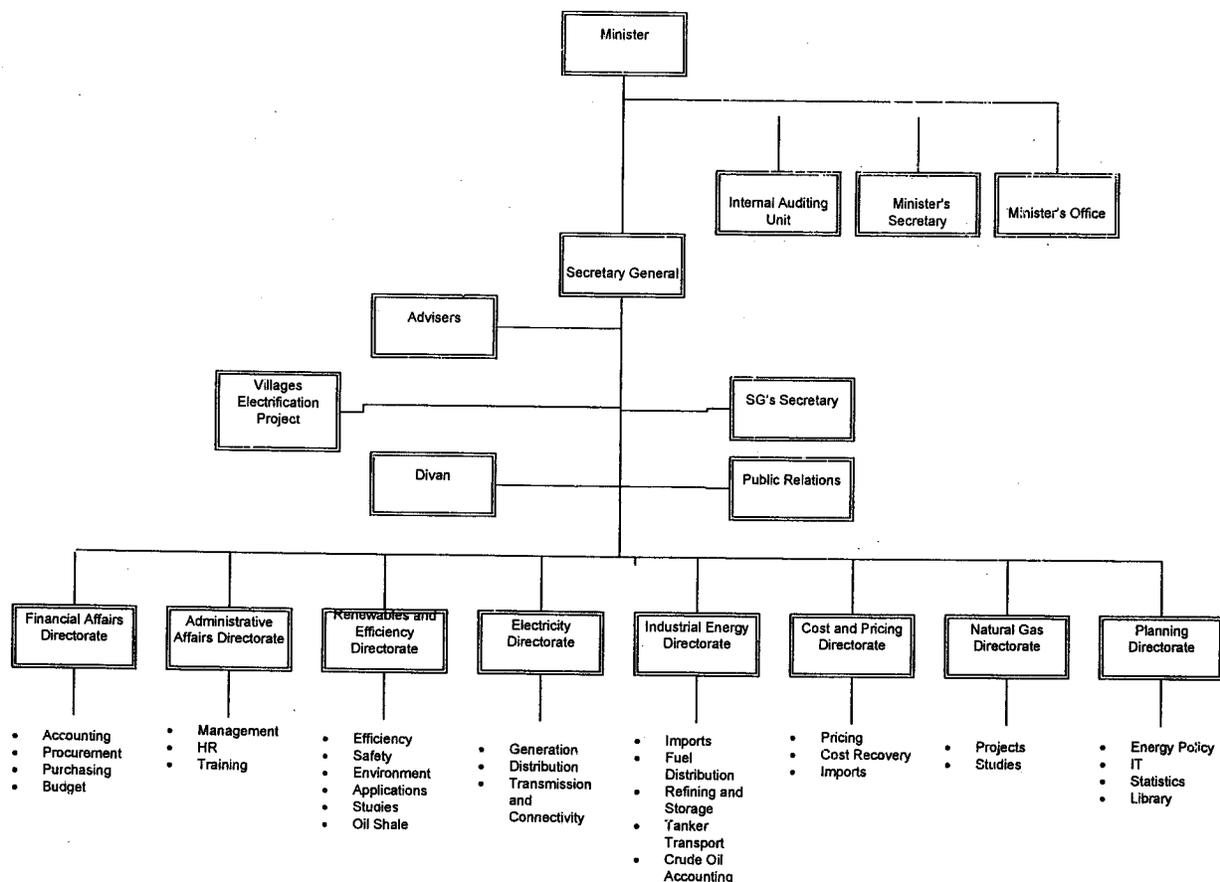


Figure 2. MoEMR Organizational Structure

- Central Electricity Generation Company (CEGCO), which is solely an electric-power generator. It generated about 94% of the total electricity produced in 2005. It was privatized at the beginning of 1999, and recently sold to a private investor.
- Sarafat Electricity Generation Company (SEGCO), which is a shareholding company owned by the government, and operates a single power plant of about 300 MW based on combined cycle fired by natural gas.
- Bio-Gas Company is a shareholding company owned by CEGCO and the Greater Amman Municipality. It was founded in 2000 to utilize biogas produced from municipal and organic wastes to generate electricity.

#### Oil and Gas Sub-sector

- Natural Resources Authority (NRA) is responsible for all activities related to the exploration and development of minerals and hydrocarbon deposits. It is entitled to lease rights for the exploration and exploitation of oil and gas.
- National Petroleum Company (NPCO) is a state-owned public shareholding company, which was established for the exploration and exploitation of oil and gas in a concession area of about 7000 km<sup>2</sup> in the northeastern quadrant of Jordan including the Risha gas field.
- Jordan Petroleum Refinery Company (JPRCO) is a public share holding company with only 0.02% of its shares owned by the government. It is responsible for refining of imported crude oil, storage and distribution of petroleum products in Jordan. Its concession agreement expire in early 2008 and is currently being renewed on a yearly basis as a service agreement.

### Other Institutions

- Jordanian Nuclear Energy Commission is an independent governmental institution that was established in 2001 to transfer, manage, and control nuclear energy technology for peaceful applications.
- National Energy Research Centre (NERC) is affiliated with the Higher Council for Science and Technology. It was established in 1998 to coordinate and conduct scientific and applied research in new and renewable energy schemes, energy efficiency and oil shale. NERC's board of directors is chaired by the Minister of Energy and Mineral Resources.

## 2.2 DM Focus and Structure

With continued support to the Jordanian Energy Sector, USTDA decided to sponsor this DM to evaluate renewable energy projects in Jordan. As a result, USTDA retained the services of the Interdisciplinary Research Consultants-US (IdRC-US) for the analysis. The Mission's main objective was to assess the technical and financial needs for USTDA-funded studies for a number of power and renewable energy related activities in Jordan, as well as identify other potential relevant sectoral projects for USTDA financing.

The IdRC-US technical team conducted the DM Mission to Amman- Jordan in a prolonged field trip between May and August 2008. During the DM mission, meetings were conducted with government and sector officials, and with officials from the U.S. Embassy and USAID. In the late stages of the DM, USTDA received a proposal for the conduct of a Feasibility Study for a 46 MW facility. The DM team also conducted the needed analysis and stakeholder interviews needed to give a technical recommendation to USTDA on the viability of this project.

This Definitional Mission Report is based on IdRC-US's trips to the host country, phone interviews and meetings with U.S. manufacturers and service providers, as well as multilateral and bilateral institutions, both before and after the field exercise. The report addresses all issues set forth in the Mission's Terms of Reference and it is presented in a format that conforms to USTDA's general guidelines for DM Reports.

## 3.0 RECOMMENDED PROJECTS

Throughout the DM a total of four projects were identified in collaboration with the relevant sector entities in Jordan. However, only two of those are being recommended for USTDA consideration for funding. Table 2 below summarizes the four projects that were identified and indicates the reasons for not including the remaining two projects for USTDA funding.

**Table 2. Summary of Key Projects Identified During the Definitional Mission**

Project	Notes on Recommendation/Non Recommendation for USTDA Funding
Feasibility Study for Power Generation Using Solar Energy	This project is in line with the MoEMR strategy for the utilization of renewable sources of energy, the Ministry wants to start this on a "pilot" basis. The plant size desired by the Ministry at this stage is 5MW to be implemented on a PPP basis. It is believed that the size of the projects (i.e., 5MW) would not be attractive to the private sector especially that NEPCO does not offer preferred tariffs for electricity generated from renewable sources. The project could be promising if it were done at a larger scale. Given the relatively higher unit generation cost of solar power plants, the GoJ, however, has a preference to start with a small scale pilot to verify viability, to be followed with a larger facility. At a later stage of the DM, an initiative was made by a Jordanian group through an unsolicited application to USTDA for the conduct of a Feasibility Study for a 50 MW pilot facility in two stages, a 5MW pilot, to be followed by a 45 MW plant. Given the GoJ's interest in the subject, the willingness of a US provider to implement the study in a bi-staged approach, compliance with the national strategy for energy, the possibility of securing financing, and the large US export potential, the project was recommended for USTDA funding.
Feasibility Study for Mini Hydros and Pumped Storage Schemes <sup>a</sup>	This project was identified by MoEMR and was endorsed by the Jordan Valley Authority, which is responsible for the management of the dams in Jordan. A similar concept is applied at one of Jordan's dams (King Talal). Therefore, expanding the initiative to include all Jordanian dams with potential could offer tremendous opportunities for reducing electricity expenditures by Jordanian water management systems, and result in significant US exports. This project was also recommended for USTDA funding.
Feasibility Study for a Waste-to-Energy Facility in Jordan	This project was identified for one of the larger landfills of northern Jordan (Akaider). The project has a huge potential for environmental protection, and US exports. However, the commitment of the Ministry of Municipal Affairs that is responsible for managing solid waste in Jordanian Municipalities (except Amman) did not seem promising. Despite talks with MoMA and the agreement to recommend the project for USTDA funding, the MoMA tendered the project on a BOT basis, including the conduct of the FS which is to be done by the prospective concessionaires.
Feasibility Study for the Utilization of Geothermal Energy	This project was identified by the Ministry of Planning and International Cooperation. However, a previous study undertaken by the Japanese International Cooperation Agency revealed that the financial feasibility of the project is not attractive.

<sup>a</sup> although the Director of Renewable energy at the MoEMR confirmed the need of the project and approved the ToR presented in following section, the GoJ later asked that emphasis be placed on solar energy initiatives given that they had a higher priority.

As a result, the Feasibility Study for Mini Hydros and Pumped Storage Schemes and a Feasibility Study for Solar Power Generation were recommended for USTDA funding and were further investigated and studied with the MoEMR and other relevant stakeholders. The following sections present further details on the projects' specifics.

### 3.1 Feasibility Study for Mini Hydros and Pumped Storage Schemes in Jordan

*This section has been omitted.*

### 3.2 Feasibility Study for a Concentrated Solar Power Plant

Solar power projects were initially identified by the Directorate of Renewable Energy at the Ministry of Energy and Mineral Resources, but on a small scale. These types of investments are in line with the updated National Energy Strategy, which has been recently updated and emphasizes the importance of renewable and non-traditional sources of energy that are also friendly to the environment. Additionally, USTDA received a request from the Minister of Planning and International Cooperation to fund a solar power project in Jordan. Specifics of the proposed assistance in this area are described in more detail in the following sections.

#### 3.2.1 Project Rational

Solar power technologies convert sunlight into electricity through concentrating solar thermal devices, or various other technologies. Solar technologies such as Photo Voltaic (PV) and Concentrated Solar Power (CSP) increase the supply of energy and may be characterized as supply side technologies. There are different possible options of solar energy applications in Jordan. Those include solar panel roofs in industrial estates, poultry farms, and storage warehouses, and stand alone or central generation systems to supply street lighting, green hotels and resorts, etc. Such systems would help in reducing dependence on conventional power generation schemes and thereby save some of imported fuel and resulting combustion emissions. Although solar power generation systems are considered to be energy projects, there are other important additional dimensions such as improved eco-tourism in historical areas, social and agricultural activities in remote areas. This subject was not assessed or studied in the past, thus, there is a need for future support in surveying and evaluating potential of employing various solar power generation technologies in Jordan, especially in the southern region.

The project at hand aims to assess eSolar's concentrated solar power technology and how to utilize it in Ma'an, and to further study other relevant variables such as potential locations, facility size, technical specifications etc., and assessing prospects of the scheme in the Ma'an Special Development Zone. This would have some positive impacts on both of energy and environmental image in Jordan.

The Development Zones Initiative was launched in 2006 with the purpose of reducing disparities between the governorates and the regions in the Kingdom, and in order to ensure the distribution of development gains across the nation. Such zones are intended to create integrated areas for economic, scientific and social activities that build on the respective areas' competitive advantages. Outcomes of the initiative include job creation, poverty alleviation, and economic development, in addition to enhancing Jordan's socio-economics and living conditions.

To institutionalize the initiative, the Development Zones Commission was established in 2008 and entrusted with the creation, regulation, and oversight of the various development zones in Jordan. Of its many responsibilities, the DZC provides a one stop shop that provides potential investors with all needed information and requirements for investment and opportunities in Development Zones. This includes licensing, labor issues, fees/taxation issues, and requirements for operations. The DZC's regulatory framework was set by the adoption of Development Zones Law No. (2), which was adapted by the Parliament in 2008.

There are three development zones that are currently operating in Jordan, in addition to a fourth one that was recently announced during the World Economic Forum held in Jordan this year. The Zone in the study at hand, **Ma'an Development Area (MDA)**, is comprised of an area of approximately 9 km<sup>2</sup> consisting of four complementary components; a residential community, an industrial park, skill development center, and a Hajj Oasis. The zone is set to become a regional hub for industrial activity and a centre of excellence for vocational training in Jordan. MDA will also be home to a thriving and self-sustained city providing its residents and visitors with a quality living and working environment to fulfill their potential, as well as a religious landmark for pilgrims on their way to the Holy Cities, offering them the ideal environment for their rest, relaxation and prayer. The Ma'an Development Company (MDC) was recently established as the custodian of the success and development of MDA and to establish the project as a safe and attractive destination for investors and developers, and an agent of positive change for Ma'an.

### 3.2.2 Project Concept

The project at hand was proposed by Millennium Energy Industries (MEI), a Jordan based regional solar solutions firm, together with eSolar (a California based technology partner) and the Maa'n Development Company which is the developer of the Maa'n Industrial Estate among other assets in southern Jordan. The main theme of the proposed project is to conduct a detailed assessment for the implementation of the eSolar technology in the Ma'an Development Zone, and to identify the specific needs of such a solar power facility, which could help in increasing dependence on a free and clean source of solar energy.

As clearly stated in the updated national energy strategy, the GoJ is committed to increasing the share of indigenous energy resources, including all renewables and oil shale, from their current level of about 0.5% of the total electricity generation to reach around 10% from the total installed capacity. Since solar energy projects involve different institutions in Jordan, mainly MoEMR, Ministry of Public Works and Housing, Ministry of Agriculture, Ministry of Environment, Executive Privatization Commission, and individual beneficiaries, the proposed study will identify institutional arrangements for the implementation of future solar electricity projects. Exploring public-private partnerships will be also considered.

The assignment at hand and the Contractor's work described herein, is to result in a feasibility study for a (CSP) project based on power plant technology supplied by eSolar, whereby implementation for engineering, procurement and construction will be done in a phased approach. This will include an initial 5MW demonstration project, followed by a separate and independent 46MW project or multiple projects. The feasibility study aims to provide information to the Grantee who desires to achieve financial closure by the end of 2009. This will include technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, permitting assistance, and project implementation planning.

The study will rely in part on commitments by the Grantee to provide project management support and local project implementation information (including but not limited to the provision of local information to be obtained, or the coordination of meetings in or near the country of Jordan, project costs, site conditions, facilitation of meetings, and financing market opportunities). Unless otherwise indicated herein, the Contractor will rely on information provided by Grantee and review elements of the Front End Engineering Package (FEEP) to be supplied by eSolar during the course of the study.

### 3.2.3 International Best Practices

Between 1970 and 1983, solar power systems and PV installations, grew rapidly. Dropping oil prices in the early 1980s moderated the growth of solar power from 1984 to 1996. Since 1997, solar power development has accelerated again due to supply issues with oil and natural gas, global warming concerns, and the improving economic position of solar power relative to other energy technologies. Solar power production growth has averaged 40% per year since 2000 and installed capacity reached 10.6 GW at the end of 2007. In some countries, recently, it has been economical for investors to install PV for free in return for a long term power purchase agreement. Almost 50% of commercial systems were installed in this manner in 2007.

Solar power schemes are spreading around the world. For example, Spain has recently completed two 20 megawatt MW solar power plants, one in Jumilla and the other in Beniexama. Another recently completed 14 MW plant is located at Nellis Air Force Base in the USA. Germany has a 12 MW plant in Arnstein, and a 10 MW system in Pocking, with a 40 MW power station planned for Muldentalkreis. Portugal has an 11 MW plant in Serpa and a 62 MW power station is planned for Moura. A solar power station proposed for Australia that will use heliostat concentrator technology, should come into service in 2010. It is expected to have a capacity of 154 MW when it is completed in 2013. Many of these plants are integrated with agriculture and some of them use innovative tracking systems that follow the sun's daily path across the sky to generate more electricity than conventional fixed-mounted systems. There are no fuel costs or emissions during operation of the power stations. Water, which is needed for cooling purposes, is a concern for such projects but more in terms of availability rather than consumption, especially that such projects are usually implemented in areas where the sun is most intense and water resources are limited. However, there are technologies available for low water consuming cooling systems.

### 3.2.4 Proposed Terms of Reference

*The proposed terms of reference has been omitted, please see terms of reference as described in the RFP.*

### 3.2.5 *Qualifications*

A team of experts will be required to conduct the feasibility study. The team should include senior U.S. experts that are experienced in and fully familiar with hydro power projects, electricity generation, energy economics, dam and hydro facilities operations, and financing options. The team should include the skill areas listed below. The experts should have demonstrated experience to reflect the criteria as noted following each skill area.

#### **Energy Economist- Team Leader**

- ◆ Team Leader: demonstrated experience as a leader of consulting teams.
- ◆ Energy Economics: at least 10 years experience with the economics of solar energy projects, with specific experience in solar power facilities.
- ◆ Country/Region: experience working on power and energy projects in Jordan and/or the Middle-East region.
- ◆ Education: advanced degree in economics, or related field.

#### **Electrical Engineer**

- ◆ Electrical Engineering: at least 10 years experience in solar energy projects
- ◆ Country/Region: experience working on solar power and energy projects in Jordan and/or the Middle-East region.
- ◆ Education: advanced degree in electrical engineering, or related field.

#### **Process Engineer**

- ◆ Engineering: at least 10 years experience in solar power plants processes (with commercial experience in the design and operation of solar energy facilities)
- ◆ Country/Region: experience working on solar power and energy projects in Jordan and/or the Middle-East region.
- ◆ Education: advanced degree in electro-mechanical engineering, or related field.

#### **Financial Analyst**

- ◆ Management/Planning: at least 10 years experience in financial modeling and forecasting for energy and solar power projects, power infrastructure projects, and tariff structures. Also, experience in working with organizations involved in the financing of power and energy projects is required.
- ◆ Country/Region: experience working on solar power and energy project finances in Jordan and/or the Middle-East region.
- ◆ Education: advanced degree in finance, economics, or related field.

#### **Legal/PPP Specialist**

- ◆ Experience: at least 10 years experience in working with organizations regulating the solar power sector, with experience in institutional assessments and PPP formulation
- ◆ Country/Region: experience working on solar power and energy project finances in Jordan and/or the Middle-East region.
- ◆ Education: advanced degree in law, finance or related field.

### 3.2.6 *Suggested Contracting Team Selection Criteria*

*The selection criteria has been omitted, please see criteria as described in the RFP.*

### 3.2.7 *Implementation Timeline*

The implementation of the proposed Feasibility Study should not exceed eight months.

*The full timeline has been omitted.*

## **2.8 Estimated Budget**

The Table below shows the estimated budget and staff breakdown. A total of 398 expatriate man days will be required. The total cost is estimated at \$738,492.

*The full budget has been omitted.*

### **3.2.9 Grantee Level of Commitment and Grantee Contact Info**

This project was presented to USTDA by a Jordan based group (MEI) in conjunction with a US based group (eSolar). It was then presented to the Minister of Energy and Mineral Resources in conjunction with the Ma'an Development Corporation, who confirmed the high level of Government's support of such projects. The Regional Manager of MEI is the main contact point for the project; his contact information is below.

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### **3.1.10 Implementation Financing**

Implementation financing for solar power generation plant in Jordan has not yet been determined. The MoEMR's policy is to promote power generation financed by the private sector through IPPs. So far, this has been quite successful and there has been increasing interest from the private sector. Therefore, it is believed that the project at hand under this proposed study could be financed by the private sector or through Public Private Partnerships.

The proposed study will seek to better understand the financing prospects and structure for the project, as the financial crisis in 2009 settles and bank and private sector appetite for new technology risk is better understood. The project will leverage Catalyst Private Equity (which is part of the US group pursuing this) investor base for project funding and financing, including US OPIC, Ithmaar Bank of Bahrain, and other institutional and private investors. Catalyst has board approval from the US OPIC for a \$33 million USD debt facility, some of which can be deployed to finance the project if proven feasible.

One of the tasks in the proposed study will identify the ideal set up for project ownership, which will help determine the most appropriate methods of financing the implementation. To ensure that all appropriate financing options are considered, the Terms of Reference states that the Consultant will identify likely sources of financing. Consultant should take special care to fully discuss each option with representatives of USAID, World Bank, Islamic Development Bank, Kuwait Fund for Economic Development, and other international financial institutions that have already made significant investments of time, effort and capital in the Jordanian energy sector. The ToR also states that the consultant should investigate appropriate financial mechanisms for PPP and PSP in the implementation of the project and recommend general performance measures and covenants to monitor financial management and performance.

Discussions with World Bank representatives confirmed the Bank's commitment to the Jordanian energy sector and have indicated that any initiatives would be welcome for consideration of WB financing. An informal discussion with a representative of the AFESD indicated that if presented properly by the Government of Jordan, they would consider financing of the project provided that it goes through the Fund's project cycle.

### **3.2.11 U.S. Export Potential**

The most critical component in solar power systems is the panels and/or the concentrator technologies to be used. The expected future solar power market in Jordan provides an excellent opportunity for U.S. companies to invest as part of the GoJ's policy to reduce dependence on imported energy. The panels and/or solar concentrators in a solar power system are basic keys to achieving such objectives. Some US Companies such as GE and AEE have already established a presence in Jordan for the supply of different systems. It is companies like those that can play a significant role in the supply of necessary equipment for the Jordanian solar power schemes. Once the ToR for the proposed study have been finalized, the DM will contact those, and other US suppliers to develop and understanding of their interest in the Jordanian market.

It is believed that the Jordanian Free Trade Agreement with the US will facilitate the market entry for US products, and with the anticipated growth in the energy sector, specifically solar power generation, in Jordan, significant export opportunities will arise. It is estimated that the local market will absorb between \$30-60 million during the next 5-10 years.

The project will rely on many imported equipment including:

- The power block – steam turbine and cooling towers/equipment
- Receiver towers and camera towers will be manufactured locally according to the specifications provided by eSolar
- The receivers (boilers) themselves will be supplied by eSolar
- Mirrors, mounting frames and tracking technology and software supplied by eSolar (with a vision that in the long term some of this may be manufactured locally)
- Piping, vessels, insulation and control systems

### **3.2.12 Foreign Competition**

Depending on the eventual source of funding for the project, foreign companies from Europe can be expected to bid for the design, construction services, and provision of equipment/spare parts. However, given the strong presence and previous performance of relevant US companies in Jordan, U.S. companies have a competitive opportunity to bid on supplying the required equipment.

Discussions with various representatives in Jordan indicated that they are interested in procuring US goods provided that the response time to RFQ's and delivery times can be reduced. This is seen as an opportunity for US businesses to establish a presence in the region, possibly through more authorized dealers, to increase their competitiveness in the sector.

### **3.2.13 Impact on the Environment**

The project is not expected to have any significant adverse environmental impacts, on the contrary, the project is considered one that is environmentally friendly that reduces reliance on traditional electricity generation plants. Furthermore, the Contractor of the Feasibility Study will conduct a preliminary environmental statement, keying on potential impacts of the Project on (a) ecological resources, (b) cultural heritage sites and relics, (c) soil erosion, (d) noise and air quality, (e) potential accidents and spills of chemicals, and (f) local community disturbances from construction activities. The Contractor will outline appropriate mitigation measures, management procedures and monitoring programs, if any.

As mentioned above, the project is an environmentally friendly one and promotes the concepts of environmental protection in electricity generation.

### **3.2.14 Impact on U.S. Labor**

In regard to concerns on the impacts of U.S. labor, support for the implementation of solar energy in Jordan is not expected to result in the relocation of U.S. jobs overseas. On the contrary, the equipment and services required for the operation of such facilities to be supplied by U.S. manufacturers will generate additional employment in the U.S.

### **3.2.15 Justification**

There are three primary reasons why USTDA should fund this project:

- ◆ Through USAID, the US Government is in the process of initiating an energy program in Jordan. Key components of this program are energy efficiency, and US Technology transfer. The proposed project is in line with this new program's objectives and would complement the USG's objectives in the Jordanian energy sector.
- ◆ By providing the initial funds for a FS, USTDA will assure that U.S. firms will become involved in the project development process. As firms participate in the process, the likelihood of U.S. exports becomes greater.
- ◆ In the coming 5 years, there is a huge potential power and energy projects in Jordan. There are also significant projects in the area of water resources which entail significant needs for pumping equipment.

Such study creates an opportunity for US providers to enter and strengthen their positions in the Jordanian market.

Being a fairly new concept that has not been implemented at a large scale in Jordan, the implementation and future expansion of this initiative will entail technology transfer and productivity enhancement of Jordan's power management infrastructure.

**ANNEX 3**



**U.S. TRADE AND DEVELOPMENT AGENCY  
Arlington, VA 22209-2131**

**NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS**

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

**USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):**

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

**NATIONALITY:**

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S.

subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

## 2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host country firms or individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

## 3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a "U.S. firm" as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a "U.S. firm" if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

## **SOURCE AND ORIGIN:**

### 1) Rule

In addition to the nationality requirement stated above, any goods (e.g., equipment and materials) and services related to their shipment (e.g., international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g., local food, housing and transportation) are eligible without specific USTDA approval.

### 2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

### 3) Definitions

“Source” means the country from which shipment is made.

“Origin” means the place of production, through manufacturing, assembly or otherwise.

*Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.*

**ANNEX 4**

## GRANT AGREEMENT

This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA") and International for Energy Technology Industries (IETI, doing business as Millennium Energy Industries [MEI], hereinafter referred to as "MEI" or "Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US\$738,492 ("USTDA Grant") to partially fund the cost of goods and services required for a feasibility study ("Study") on the proposed Concentrated Solar Power (CSP) Plant project ("Project") in Jordan ("Host Country"). The projected technology supplier is eSolar Inc. (eSolar) of California. The Study would be competitively bid and both the Grantee and eSolar will each be providing a cost share.

### 1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the Contractor under which the U.S. firm selected by the Grantee ("Contractor") will perform the Study ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

### 2. Terms of Reference

The Terms of Reference for the Study ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The Study will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the Study shall also be included in the Contract.

### 3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study.

### 4. Grantee Responsibilities and Contractor Support

(A) The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support. In addition to the USTDA funding provided under this Grant Agreement, the Grantee agrees that it shall provide US\$124,800 worth of in-kind costs to contribute to the costs of goods and services required for the completion of the Study (the "Grantee Cost Share"). The Grantee Cost Share shall be specified in the Contract between the

Grantee and the Contractor and shall include, but not be limited to, the provision of the following: project management support; relevant local data and information such as information pertaining to legal and regulatory requirements, information pertaining to financing market opportunities, and information pertaining to Project costs and site conditions; facilitation and coordination of meetings in Jordan; and assisting with obtaining any required information from eSolar.

(B) In addition to the USTDA funding provided under this Agreement and Grantee Cost Share, eSolar shall be responsible for ensuring that the Contractor and/or its subcontractors cover at least US \$802,000 of costs to complete the full Terms of Reference.

## **5. USTDA as Financier**

### **(A) Competitive Selection Procedures**

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through Federal Business Opportunities ([www.fedbizopps.gov](http://www.fedbizopps.gov)). Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information.

### **(B) USTDA Approval of Contractor Selection**

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the Study. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the Study. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected.

### **(C) USTDA Approval of Contract Between Grantee and Contractor**

The Grantee and the selected Study Contractor shall enter into a contract for performance of the Study. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

### **(D) USTDA Not a Party to the Contract**

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the

Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

**(E) Grant Agreement Controlling**

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

**6. Disbursement Procedures**

**(A) USTDA Approval of Contract Required**

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

**(B) Contractor Invoice Requirements**

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the Study by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

**7. Effective Date**

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

**8. Study Schedule**

**(A) Study Completion Date**

The completion date for the Study, which is January 31, 2011, is the date by which the parties estimate that the Study will have been completed.

**(B) Time Limitation on Disbursement of USTDA Grant Funds**

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

**9. USTDA Mandatory Clauses**

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, and I.

**10. Use of U.S. Carriers**

**(A) Air**

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

**(B) Marine**

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

**11. Nationality, Source and Origin**

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country

are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

#### **12. Taxes**

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

#### **13. Cooperation Between Parties and Follow-Up**

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause H of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

#### **14. Implementation Letters**

To assist the Grantee in the implementation of the Study, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

#### **15. Recordkeeping and Audit**

The Grantee agrees to maintain books, records, and other documents relating to the Study and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the Study and the Grant Agreement.

#### **16. Representation of Parties**

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the Solar Power Division General Manager. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

#### **17. Addresses of Record for Parties**

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

To: Shukri Halaby  
International for Energy Technology Industries  
P.O. Box 930 Amman 11821 Jordan  
Phone: +962 6 585 5533  
Fax: +962 6 581 3753  
Shukrih@millenniumenergy.co.uk

To: U.S. Trade and Development Agency  
1000 Wilson Boulevard, Suite 1600  
Arlington, Virginia 22209-3901  
USA

Phone: (703) 875-4357  
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.: 11 9/10 1001  
Activity No.: 2009-21030A  
Reservation No.: 2009210039  
Grant No.: GH2009210011

#### **18. Termination Clause**

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the Study, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.

#### **19. Non-waiver of Rights and Remedies**

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

**20. U.S. Technology and Equipment**

By funding this Study, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

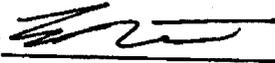
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**IN WITNESS WHEREOF**, the Government of the United States of America and International for Energy Technology Industries, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.

**For the Government of the  
United States of America**

**For International for Energy  
Technology Industries**

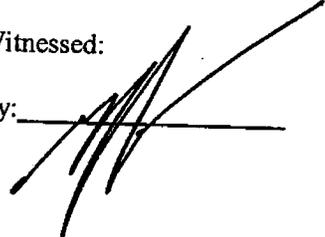
By:   
Taraneh Bastani

By:   
Ennis Rimawi

Date: Sept 26, 09

Date: Sept. 26, 2009

Witnessed:

By: 

**Annex I – Terms of Reference**

**Annex II – Mandatory Clauses**

## Annex I

### **Terms of Reference**

#### **Introduction**

The term "Contractor" used herein shall mean the U.S. firm selected by the Grantee to perform the work described herein. The term "Grantee" used herein shall mean International for Energy Technology Industries, commonly referred to as Millennium Energy Industries (MEI).

The objective of the Study is to examine the feasibility of a Concentrated Solar Power (CSP) project based on power plant technology supplied by eSolar, Inc. (eSolar). It is anticipated that the implementation of engineering, procurement and construction will be done in a phased approach, including initially a 5 MW demonstration project, followed by a separate and independent 46 MW project or multiple projects, collectively known as "the Ma'an Project."

The Study will include eSolar technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, permitting assistance and project implementation planning. The Grantee has already chosen a site in the Ma'an Industrial Estate for the planned facility but requires further guidance on site assessment.

The Grantee shall provide project management support, local project implementation information (including but not limited to the provision of information, data and material, the coordination of meetings, the provision of information pertaining to project costs and site conditions, facilitation of meetings, and the provision of information relating to financing market opportunities) and assist in obtaining necessary information from eSolar. The Contractor shall perform the tasks hereunder, including the review of the Preliminary Design Package ("PDP") and eSolar's Cost, Schedule, and Risk Assessment ("CSRA") which are key elements of the Front End Engineering Package (FEEP) for eSolar's modular design of a standard 46 MW CSP project. The PDP and CSRA will be supplied by eSolar to Grantee and the Contractor during the course of the study. The FEEP is being conducted by eSolar and a U.S. engineering firm under contract to eSolar and is scheduled to be completed by October/November 2009.

#### **Task 1: Project Start-Up and Kick-off**

A kick-off meeting will take place in Amman, Jordan. The Contractor shall meet with the Grantee and eSolar in Amman, to discuss the basis for the Ma'an Project and its objectives and to develop a clear and comprehensive understanding of the Government of Jordan's (GOJ) planned activities and national strategy related to solar and renewable energy projects.

Other stakeholders that the Contractor shall meet with while in Jordan include the Ma'an Development Company (MDA), Ministry of Energy and Mineral Resources (MEMR), Electricity Regulatory Commission, National Electric-Power Company (NEPCO), National Energy Research Center (NERC), Development Zones Commission, Ministry of Water and Irrigation, and others that would be suggested by the Grantee.

Prior to the meeting in Jordan, the Contractor shall review studies and data provided in advance by Grantee, eSolar, MEMR and other relevant ministries, World Bank, USAID projects, and other donor-funded project reports on solar and renewable energy projects in Jordan. The Contractor shall identify additional information required from the Grantee. The Contractor shall compile all reports and information into a database that will be available to all parties for the duration of the feasibility study.

The Grantee shall make available to the Contractor available details regarding previous efforts in the solar energy sector in Jordan and other details needed to analyze the development of the sector in Jordan.

Deliverable: Report on the findings of the initial meetings, documentation of all gathered information and previous studies in an electronic database, and a detailed work plan on how the following tasks are to be completed.

**Task 2A: Review of Competing Technologies**

The Contractor shall review and describe the status of the various CSP technology applications and developments and solar thermal power technologies that may be pertinent to Jordan. The Contractor shall then provide a brief description of each technology, along with a summary of technology characteristics, and any public (non confidential) information available to the Contractor regarding the current status of each technology and its availability; ownership and licensing requirements, environmental considerations; economic assessment; infrastructure requirements; and definition of technical and commercial risks. The purpose of this survey is to put eSolar technology in context with other CSP technologies available in the market.

**Task 2B: Technology Screening and Due Diligence of eSolar's Technology**

The Contractor shall conduct a review and analysis of eSolar's technology based on a) data and analysis to be provided by eSolar regarding the applicability of its technology in Jordan; and b) site visits to the eSolar pilot facility in Lancaster. The Contractor shall:

- a) Undertake a techno-economic review of the eSolar technology.
- b) Develop and document the methodology for technology performance measurement and assessment.
- c) Review the eSolar technology and observe it in operation at the eSolar pilot facilities.
- d) Perform a systems integrity review (equipment operations, control and maintenance issues) based on a review of the design: third party components; and equipment quality assurance and reliability information, as well as any operating experience eSolar has to date.
- e) Document energy conversion efficiency factors based on documented data measurements, and control systems configuration and output.
- f) Extrapolate solar efficiency and field performance provided by eSolar based on the demonstration plant in California to fit the proposed site in Jordan.
- g) Identify technology and operations risk areas and mitigations as it relates to project yield, as well as capital and operating expense.

Deliverable: Report detailing the findings of the technology screening to include a comparative survey of the various technologies, with a detailed analysis to confirm the suitability of eSolar's technology for the proposed Ma'an Project in Jordan. The report shall also include technology due diligence performed on eSolar's design.

**Task 3: Electricity Market and Utility Connection Study**

Grantee will provide electricity market and utility connection data and information to Contractor for its review and will schedule and attend meetings to facilitate provision of necessary information. Macroeconomic market data will be collected by the Contractor, including analysis of electricity production and consumption in Jordan. The Contractor shall collect and document information on the grid, and any market and grid information that is available through the Jordanian government, NEPCO, or generation and distribution companies, including the cost structure currently in place. This study shall include the trends in demand growth in Jordan and the Ma'an area. The study will also include a review of operating power generation resources located in Jordan, as well as a review of proposed power plant projects that are currently in an official permitting review process for meeting those growth demands.

The Contractor shall also review the GOJ's National Energy Plan, which shall be provided by the Grantee, in order to understand electricity demand and supply projections. Contractor will review the specifications and requirements to achieve grid connection, and highlight any issues related to solar energy distribution capacity issues that NEPCO has to address for the Ma'an Project to be viable.

Based on the above analysis and the electricity demand projections in the Ma'an region, and the electricity demand that could be fully/partially served through a series of proposed projects, the Contractor shall recommend the phasing and sizing options for the Ma'an Project. This will include an initial 5 MW demonstration project, to be followed by a separate and independent 46 MW project or multiple projects based on eSolar technology that addresses the national energy strategy and objectives.

In addition to electricity, the Contractor shall assess the opportunity for provision of thermal energy for industrial applications including steam generation, hot water delivery, and cooling facilities within the premises of the Ma'an Developmental Zone that is managed by the Ma'an Development Corporation such as the Ma'an Industrial Estate.

Deliverable: Report on the findings and analysis of the electricity market and utility connection data. The report should detail all assumptions made for the various scenarios related to electricity consumption generation, and demand projections.

**Task 4: Site Assessment, Data Collection and Permitting**

The Contractor shall conduct an assessment of the proposed site in order to determine its adequacy for the proposed Ma'an Project, and determine any improvements needed in relation to infrastructure requirements and servicing, site preparation, utility grid connection and capacity.

The Contractor shall work with MEMR to obtain data from the nearest, or other appropriate weather station(s). The Contractor shall analyze this and other insulation data provided by MEMR. The Grantee shall ensure that the Contractor has access to the pertinent data and information.

Based on information about the eSolar technology, and the site conditions, the Contractor shall assess water availability, adequacy, quantity and quality. This effort shall be based on information supplied by the Water Authority of Jordan and its regional office in Ma'an. To the extent available, the government position and implications for utilizing water versus air cooling power generation technology will be considered as a factor in the plant configuration and technology selection.

Finally, the Contractor shall review the different types of licensing required for construction of a power plant project in Jordan, (the Grantee shall assist in providing the necessary data for this, including Jordan's licensing requirements) and prepare a description of the necessary licensing and permitting procedures including water supply and wastewater discharge, electricity and power, environmental licensing, and construction and registration permits.

Deliverable: Detailed report on the work performed under this task, including the findings of the site assessment clearly identifying site advantages and how those could be capitalized on, and site deficiencies with proposed measures to overcome obstacles.

**Task 5: Facility and Equipment Requirements**

**46 MW Power Plant** - Based on the estimate for electricity and thermal energy demand from Task 3 above, and the technology screening results from Task 2 above, the Contractor shall review and comment on the PDP for eSolar's 46 MW preliminary design, and its application to the Ma'an Project under development by the Grantee in Jordan. The Contractor will use the PDP in its review of eSolar's technology and the applicability of eSolar's 46 MW design for the Ma'an

Project. The Contractor's analysis shall focus on the following elements, which will be included in the PDP, and perform the necessary analysis for the localization of the PDP for the specific site in Ma'an:

- General arrangements
- Building drawings
- Piping and instrumentation diagram
- Process flow diagram
- Material and energy balance
- Major equipment list with sizing
- Major equipment specifications
- One-line diagrams
- Control system single line diagrams
- Instrument Index

The Contractor shall review the PDP and apply its principles to the specific needs of Jordan and the Ma'an Project. The Grantee shall ensure that the Contractor receives a copy of the PDP study from eSolar on or before two months (60 days) have passed following the completion of Task 4. If the PDP is not provided to the Contractor by this time, the Contractor shall notify USTDA in writing and USTDA shall cease its funding of the feasibility study and the Grant Agreement shall be terminated in accordance with Clause 18 thereof.

5 MW Power Plant - Based on the estimate for electricity and thermal energy demand from Task 3 above, and the technology screening results from Task 2 above, the Contractor shall evaluate a 5 MW demonstration plant in Jordan. The design of the 5 MW plant will be based on the analysis performed on the 46 MW plant and shall allow for the eventual phasing of the 46 MW plant for the Ma'an project. The Contractor shall describe the tasks required to develop this 5 MW plant, including all activities needed to complete a preliminary design of equivalent level of detail to the 46 MW preliminary designs.

Deliverable: Detailed report on relevant equipment requirements outlining the quantities and technical specifications needed for both the 5 MW and 46 MW CSP plants in Ma'an.

**Task 6: Financial and Technical Analysis**

The Contractor shall conduct a financial and technical analysis for the proposed 46 MW and 5 MW projects. The Contractor shall review and provide comment on eSolar's CSRA for the proposed 46 MW project. This review shall include, but is not limited to, analysis of costs of major plant equipment, construction, utilities (water, and electricity), and operations. The equipment list will be evaluated for the potential for the use of U.S. equipment, supplies, and technologies. The study will also include a list of potential U.S. providers, manufacturers, and equipment suppliers.

The Grantee shall ensure that the Contractor receives a copy of the CSRA study from eSolar on or before two months (60 days) have passed following the completion of Task 5. If the CSRA is not provided to the Contractor by this time, the Contractor shall notify USTDA in writing and USTDA shall cease its funding of the feasibility study and the Grant Agreement shall be terminated in accordance with Clause 18 thereof.

In completion of the financial and technical analysis, the Contractor shall conduct the following tasks:

- i. Using the CSRA study as a model, define any additional requirements for the Ma'an Project above the general parameters of the CSRA. This will include potential

differences in the, technical characteristics for the proposed solar energy plant layout including capacity, conceptual design, power generation, water and other resources requirements, equipment requirement, and supplies needed for the maintenance and operation of each proposed plant.

- ii. Develop a project cost breakdown (equipment, materials and installation) to allow for a plus or minus 10% to 30% accuracy range, accounting for local costs for power block equipment and for those elements of the solar field equipment to be provided locally (i.e. those items that will not be provided by eSolar). The Grantee shall provide local costing and local labor productivity information.
- iii. Review and update all implementation and operating costs and benefits of the facility. Estimate the economic internal rate of return (EIRR) on the basis of non-incremental and incremental economic benefits and economic costs (including economic capital, operation, and maintenance costs) in constant economic prices.
- iv. Develop a realistic and competitive fee structure for electricity sales and necessary equipment accessories (covering operation and maintenance costs, depreciation, debt service in excess of depreciation, taxes, and reasonable profit). This shall also include revenues resulting from carbon credits, and an assessment of the adequacy of the draft Jordanian renewables law in terms of tariffs and revenues of the Ma'an Project.
- v. Assess and prepare financial projections for the 5 MW and 46 MW CSP plants including balance sheet, income statement, and cash flow statement in nominal terms covering a period of 25 years. Financial projections will take into consideration the likely effects of inflation and the potential for exchange rate fluctuations.
- vi. Carry out a financial evaluation for each facility over the construction and operation period by calculating the Financial Internal Rate of Return (FIRR) and compare it with weighted average cost of capital (WACC). The FIRR and WACC will be computed using constant 2009 prices, and based on initial interest from financial institutions. The cost estimates and financial projections in nominal terms will be converted to real terms by removing the projected effects of foreign and domestic inflation and currency fluctuations. Incremental costs and benefits will be derived from evaluating the financial position under a with-project and without-project scenario.
- vii. Identify risk factors and test the sensitivity of the Ma'an Project to them, and propose mitigating measures including process guarantees offered by eSolar. Undertake sensitivity analysis by varying charges, costs, implementation delay, and combinations of these factors. The Contractor shall also calculate switching values for these factors, excluding implementation delay and review the sensitivity of the financial viability of the project to future exchange rate movements.

**Deliverable:** The Contractor shall provide a report of the work performed under Task 6 including detailed financial model including assumptions, input, and results of the financial modeling with all the financial indicators.

**Task 7: Implementation Plan**

The Contractor shall develop an Implementation Plan that provides a proposed schedule, cash flow and project execution plan for the various stages, milestones and activities of a single project. This plan will use eSolar's CSRA and PDP as a basis for further analysis on the conditions at Ma'an. In the implementation plan, the Contractor shall develop a cost estimate for potential procurement of goods and services for the implementation of the Ma'an project. This

estimate will be supported by a breakdown by category and cost of goods and services necessary for the proposed Ma'an Project.

Additionally, the Contractor shall identify likely sources of financing. The Contractor shall discuss each option with representatives of the World Bank, Islamic Development Bank, USAID, and the Export-Import Bank of the United States, the Overseas Private Investment Corporation, and other international financial institutions that have already made significant investments of time, effort and capital in the Jordanian energy sector. The Grantee will be available to participate in such meetings either telephonically or in person with the Contractor.

The implementation strategy is expected to serve as a key component for the Grantee's business plan and would serve as a business model for future similar projects in Jordan and the region. Therefore the Contractor shall identify the aspects of the project that are replicable and describe potential factors to consider in varying locations. The implementation plan shall be detailed to allow the Grantee to proceed with the tendering phase of the Ma'an project, which is expected to be implemented on a Public Private Partnership basis.

Deliverable: Detailed implementation plan and time table for the Ma'an Project.

**Task 8: Institutional Arrangements**

The Contractor shall identify the various institutional arrangements for the ownership, management, and implementation of a solar energy generation plant. The Contractor shall review and analyze the various options such as governmental ownership, private investment/ownership, public-private partnerships, lease-purchase, and others. The assessment will take into account the role of governmental entities such as MEMR, NEPCO, MDC, power generation companies and other non-governmental and private sector entities. The Contractor shall recommend the optimal structure for the Ma'an project.

The Contractor shall analyze the legal framework of the recommended institutional arrangements to ensure its compliance with existing legislation. The assessment will also review and analyze the existing institutional capacities of the various entities involved in the recommended structure to determine any capacity building needs that may be necessary to successfully implement the Ma'an project.

Deliverable: Detailed report on the potential institutional arrangements and a report describing the recommendations of the proposed management/ownership structure.

**Task 9: Review of Legal and Regulatory Issues**

The Contractor shall review and analyze regulatory issues and laws that could impact the viability of the Ma'an Project. The regulatory assessment shall include the national mandates related to renewable energy in general, and solar energy in particular. The Contractor shall identify and describe potential lack of appropriate regulations or implementation incentives.

The Contractor shall review the following documents and any related issues:

- a. Legal environment and applicable laws and regulations and implications on the Ma'an Project (including the new energy law, as well as law for the Development Zone Commission).
- b. PPA with guarantees
- c. Land lease agreement
- d. Loan agreements

The Contractor shall provide its analysis of aspects of the engineering, procurement, and contracting agreement necessary to build the Project, and shall take into account the following:

- a. Incorporation and shareholding agreements
- b. Financing/Project Structures
- c. Prospectus development
- d. Technology licensing and performance guarantees agreements between eSolar and the Grantee

Deliverable: Detailed report of the work performed under Task 9 and of the legal review, including the identification of legislative barriers, if any, and an assessment of the Project legal structure and potential risks.

**Task 10: Preliminary Environmental and Social Analysis**

The Contractor shall conduct a preliminary environmental assessment, focusing on potential impacts of the project on (a) water resource, ecological resources including flora and fauna, (b) cultural heritage sites and relics, (c) soil erosion (d) local community disturbances from construction activities, and (e) possible changes in land use. The Contractor shall describe appropriate mitigation measures, management procedures and monitoring programs, if any. The Contractor shall also conduct a preliminary social impact assessment of the Ma'an Project. Environmental and social issues that may require further analysis and/or mitigation shall be identified by the Contractor.

Deliverable: Preliminary Environmental Impact Assessment and Social Impact Analysis.

**Task 11: Host Country Development Impacts**

The Contractor will prepare a development impacts analysis to provide the project's decision-makers and interested parties with a broader view of the Ma'an Project's potential effects on the host country. The Grantee shall assist in providing access to the necessary data and information to complete this task. The analysis shall focus on what development impact is likely if the Ma'an Project is implemented according to the study recommendations. While specific focus shall be paid to the immediate impact of the project, the Contractor's analysis shall include any additional developmental benefits that may result from the project's implementation, including spin-off and demonstration effects. The factors to be considered shall include the following:

Infrastructure - The Contractor shall analyze the impact that the infrastructure changes will have both on Jordan nationally and on the locations where solar energy generation facilities are proposed.

Market-Oriented Reform - The Contractor shall provide a description of any regulation, laws, or institutional changes that are recommended and the effect they would have if implemented.

Human Capacity Building - The Contractor shall assess the number and type of local positions that would be needed to construct and operate the proposed Project, as well as the number of local people who would receive training; and shall provide a description of such additional training programs. The consultant shall include an assessment of the multiplier effect on job creation in the energy, water, agricultural, and other relevant sectors.

Technology Transfer and Productivity Enhancement Opportunities - The Contractor shall provide a description of any advanced technologies that would be utilized as a result of the Project. The discussion should include specific examples of efficiencies or other social and environmental benefits gained by the utilization of eSolar's technology.

Other - The Contractor shall describe any other developmental impacts or benefits that would result from the project, for example, follow-on or replication projects, safer

workplace, increased good governance or improved financial revenue flows to the Host Country.

Deliverable: Development Impacts Assessment.

**Task 12: Final Report**

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause H of Annex II of the Grant Agreement. The Contractor shall deliver two hard copies of the Study to the Grantee and a CD Rom including the contents of the final report as provided to USTDA.

**Notes:**

- (1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.
- (2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.
- (3) The Grantee and USTDA shall have the right to receive all work product that is developed under these Terms of Reference. The Grantee's receipt of such work product shall be subject to any confidential obligations undertaken by the Grantee with respect to eSolar's proprietary information. The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the public version of the Final Report."

## Annex II

### USTDA Mandatory Contract Clauses

#### A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America acting through USTDA and International for Energy Technology Industries (IETI, doing business as Millennium Energy Industries [MEI], hereinafter referred to as "MEI" or "Grantee"), ("Client"), dated \_\_\_\_\_ ("Grant Agreement"). The Client has selected \_\_\_\_\_ [full corporate name] ("Contractor") to perform the feasibility study ("Study") for the Concentrated Solar Power (CSP) Plant project ("Project") in Jordan ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and P. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

#### B. USTDA as Financier

##### (1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

##### (2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract

or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

### **C. Nationality, Source and Origin**

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

### **D. Recordkeeping and Audit**

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

### **E. U.S. Carriers**

#### **(1) Air**

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

#### **(2) Marine**

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

**F. Workman's Compensation Insurance**

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

**G. Disbursement Procedures**

**(1) USTDA Approval of Contract**

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

**(2) Payment Schedule Requirements**

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as a mobilization payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of (i) an approved Final Report in accordance with the specifications and quantities, set forth in Clause H below, and (ii) the cost-share certification and cost breakdown, set forth in Clause K below. Invoicing procedures for all payments are described below.

**(3) Contractor Invoice Requirements**

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

**(a) Contractor's Invoice**

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

(i) For a mobilization payment (if any):

"As a condition for this mobilization payment, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

(ii) For contract performance milestone payments:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(iii) For final payment:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

**(b) Client's Approval of the Contractor's Invoice**

(i) The invoice for a mobilization payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."

(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract

provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

**(c) USTDA Address for Disbursement Requests**

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

**(4) Termination**

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to mobilization payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

**H. USTDA Final Report**

**(1) Definition**

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

**(2) Final Report Submission Requirements**

The Contractor shall provide the following to USTDA:

(a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor, in consultation with eSolar, to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

and

(b) One (1) copy of the Final Report suitable for public distribution ("Public

Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. The Contractor shall work with eSolar to ensure that the Public Version does not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

(c) Two (2) CD-ROMs, each containing a complete copy of the Public Version of the Final Report. The electronic files on the CD-ROMs shall be submitted in a commonly accessible read-only format. As these CD-ROMs will be available for public distribution, they must not contain any confidential information. It is the responsibility of the Contractor to ensure that no confidential information is contained on the CD-ROMs.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

(d) After the Final Report has been approved by USTDA, the Client and/or the Contractor shall notify eSolar of USTDA's approval.

### **(3) Final Report Presentation**

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, and USTDA's mailing and delivery addresses. If the complete version of the Final Report contains confidential information, the Contractor shall be responsible for labeling the front cover of that version of the Final Report with the term "Confidential Version". The Contractor shall be responsible for labeling the front cover of the Public Version of the Final Report with the term "Public Version." The front cover of every Final Report shall also contain the following disclaimer:

"This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement. Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor shall affix to the front of the CD-ROM a label identifying the Host Country, USTDA Activity Number, the name of the Client, the name of the Contractor who prepared the report, a report title, and the following language:

"The Contractor certifies that this CD-ROM contains the Public Version of the Final Report and that all contents are suitable for public distribution."

(d) The Contractor and any subcontractors that perform work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name, point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(e) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.

#### **I. Modifications**

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

#### **J. Study Schedule**

##### **(1) Study Completion Date**

The completion date for the Study, which is January 31, 2011, is the date by which the parties estimate that the Study will have been completed.

##### **(2) Time Limitation on Disbursement of USTDA Grant Funds**

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

#### **K. Cost Share**

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support. In addition to the USTDA funding provided under this Grant Agreement, the Grantee agrees that it shall provide US\$124,800 worth of in-kind costs as its contribution to the costs of goods and services required for the completion of the Study (the "Grantee Cost Share"). The Grantee Cost Share shall be specified in the Contract between the Grantee and the Contractor and shall include, but not be limited to, the provision of the following: project management support; relevant data and information such as information pertaining to legal and regulatory requirements, information pertaining to local financing market opportunities, and information pertaining to Project costs and site conditions; facilitation and coordination of meetings in Jordan; and assisting with obtaining any required information from eSolar.

In addition to the USTDA funding provided under this Agreement, and Grantee Cost Share, eSolar shall be responsible for ensuring that the Contractor and/or its subcontractors cover at least US\$ \$802,000 of costs to complete the full Terms of Reference, as set forth in Annex I to the Grant Agreement and this Contract.

#### **L. Business Practices**

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

#### **M. USTDA Address and Fiscal Data**

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency  
1000 Wilson Boulevard, Suite 1600  
Arlington, Virginia 22209-3901

USA

Phone: (703) 875-4357  
Fax: (703) 875-4009

Fiscal Data:

Appropriation No.: 11 9/10 1001  
Activity No.: 2009-21030A  
Reservation No.: 2009210039  
Grant No.: GH2009210011

**N. Definitions**

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.

**O. Taxes**

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Client nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

**P. Reporting Requirements**

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the Study. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information that is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

ANNEX 5

## Terms of Reference

### Introduction

The term "Contractor" used herein shall mean the U.S. firm selected by the Grantee to perform the work described herein. The term "Grantee" used herein shall mean International for Energy Technology Industries, commonly referred to as Millennium Energy Industries (MEI).

The objective of the Study is to examine the feasibility of a Concentrated Solar Power (CSP) project based on power plant technology supplied by eSolar, Inc. (eSolar). It is anticipated that the implementation of engineering, procurement and construction will be done in a phased approach, including initially a 5 MW demonstration project, followed by a separate and independent 46 MW project or multiple projects, collectively known as "the Ma'an Project."

The Study will include eSolar technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, permitting assistance and project implementation planning. The Grantee has already chosen a site in the Ma'an Industrial Estate for the planned facility but requires further guidance on site assessment.

The Grantee shall provide project management support, local project implementation information (including but not limited to the provision of information, data and material, the coordination of meetings, the provision of information pertaining to project costs and site conditions, facilitation of meetings, and the provision of information relating to financing market opportunities) and assist in obtaining necessary information from eSolar. The Contractor shall perform the tasks hereunder, including the review of the Preliminary Design Package ("PDP") and eSolar's Cost, Schedule, and Risk Assessment ("CSRA") which are key elements of the Front End Engineering Package (FEED) for eSolar's modular design of a standard 46 MW CSP project. The PDP and CSRA will be supplied by eSolar to Grantee and the Contractor during the course of the study. The FEED is being conducted by eSolar and a U.S. engineering firm under contract to eSolar and is scheduled to be completed by October/November 2009.

### Task 1: Project Start-Up and Kick-off

A kick-off meeting will take place in Amman, Jordan. The Contractor shall meet with the Grantee and eSolar in Amman, to discuss the basis for the Ma'an Project and its objectives and to develop a clear and comprehensive understanding of the Government of Jordan's (GOJ) planned activities and national strategy related to solar and renewable energy projects.

Other stakeholders that the Contractor shall meet with while in Jordan include the Ma'an Development Company (MDA), Ministry of Energy and Mineral Resources (MEMR), Electricity Regulatory Commission, National Electric-Power Company (NEPCO), National Energy Research Center (NERC), Development Zones Commission, Ministry of Water and Irrigation, and others that would be suggested by the Grantee.

Prior to the meeting in Jordan, the Contractor shall review studies and data provided in advance by Grantee, eSolar, MEMR and other relevant ministries, World Bank, USAID projects, and other donor-funded project reports on solar and renewable energy projects in Jordan. The Contractor shall identify additional information required from the Grantee. The Contractor shall compile all reports and information into a database that will be available to all parties for the duration of the feasibility study.

The Grantee shall make available to the Contractor available details regarding previous efforts in the solar energy sector in Jordan and other details needed to analyze the development of the sector in Jordan.

Deliverable: Report on the findings of the initial meetings, documentation of all gathered information and previous studies in an electronic database, and a detailed work plan on how the following tasks are to be completed.

**Task 2A: Review of Competing Technologies**

The Contractor shall review and describe the status of the various CSP technology applications and developments and solar thermal power technologies that may be pertinent to Jordan. The Contractor shall then provide a brief description of each technology, along with a summary of technology characteristics, and any public (non confidential) information available to the Contractor regarding the current status of each technology and its availability; ownership and licensing requirements, environmental considerations; economic assessment; infrastructure requirements; and definition of technical and commercial risks. The purpose of this survey is to put eSolar technology in context with other CSP technologies available in the market.

**Task 2B: Technology Screening and Due Diligence of eSolar's Technology**

The Contractor shall conduct a review and analysis of eSolar's technology based on a) data and analysis to be provided by eSolar regarding the applicability of its technology in Jordan; and b) site visits to the eSolar pilot facility in Lancaster. The Contractor shall:

- a) Undertake a techno-economic review of the eSolar technology.
- b) Develop and document the methodology for technology performance measurement and assessment.
- c) Review the eSolar technology and observe it in operation at the eSolar pilot facilities.
- d) Perform a systems integrity review (equipment operations, control and maintenance issues) based on a review of the design: third party components; and equipment quality assurance and reliability information, as well as any operating experience eSolar has to date.
- e) Document energy conversion efficiency factors based on documented data measurements, and control systems configuration and output.
- f) Extrapolate solar efficiency and field performance provided by eSolar based on the demonstration plant in California to fit the proposed site in Jordan.
- g) Identify technology and operations risk areas and mitigations as it relates to project yield, as well as capital and operating expense.

Deliverable: Report detailing the findings of the technology screening to include a comparative survey of the various technologies, with a detailed analysis to confirm the suitability of eSolar's technology for the proposed Ma'an Project in Jordan. The report shall also include technology due diligence performed on eSolar's design.

**Task 3: Electricity Market and Utility Connection Study**

Grantee will provide electricity market and utility connection data and information to Contractor for its review and will schedule and attend meetings to facilitate provision of necessary information. Macroeconomic market data will be collected by the Contractor, including analysis of electricity production and consumption in Jordan. The Contractor shall collect and document information on the grid, and any market and grid information that is available through the Jordanian government, NEPCO, or generation and distribution companies, including the cost structure currently in place. This study shall include the trends in demand growth in Jordan and the Ma'an area. The study will also include a review of operating power generation resources located in Jordan, as well as a review of proposed power plant projects that are currently in an official permitting review process for meeting those growth demands.

The Contractor shall also review the GOJ's National Energy Plan, which shall be provided by the Grantee, in order to understand electricity demand and supply projections. Contractor will review the specifications and requirements to achieve grid connection, and highlight any issues related to solar energy distribution capacity issues that NEPCO has to address for the Ma'an Project to be viable.

Based on the above analysis and the electricity demand projections in the Ma'an region, and the electricity demand that could be fully/partially served through a series of proposed projects, the Contractor shall recommend the phasing and sizing options for the Ma'an Project. This will include an initial 5 MW demonstration project, to be followed by a separate and independent 46 MW project or multiple projects based on eSolar technology that addresses the national energy strategy and objectives.

In addition to electricity, the Contractor shall assess the opportunity for provision of thermal energy for industrial applications including steam generation, hot water delivery, and cooling facilities within the premises of the Ma'an Developmental Zone that is managed by the Ma'an Development Corporation such as the Ma'an Industrial Estate.

Deliverable: Report on the findings and analysis of the electricity market and utility connection data. The report should detail all assumptions made for the various scenarios related to electricity consumption generation, and demand projections.

**Task 4: Site Assessment, Data Collection and Permitting**

The Contractor shall conduct an assessment of the proposed site in order to determine its adequacy for the proposed Ma'an Project, and determine any improvements needed in relation to infrastructure requirements and servicing, site preparation, utility grid connection and capacity.

The Contractor shall work with MEMR to obtain data from the nearest, or other appropriate weather station(s). The Contractor shall analyze this and other insulation data provided by MEMR. The Grantee shall ensure that the Contractor has access to the pertinent data and information.

Based on information about the eSolar technology, and the site conditions, the Contractor shall assess water availability, adequacy, quantity and quality. This effort shall be based on information supplied by the Water Authority of Jordan and its regional office in Ma'an. To the extent available, the government position and implications for utilizing water versus air cooling power generation technology will be considered as a factor in the plant configuration and technology selection.

Finally, the Contractor shall review the different types of licensing required for construction of a power plant project in Jordan, (the Grantee shall assist in providing the necessary data for this, including Jordan's licensing requirements) and prepare a description of the necessary licensing and permitting procedures, including water supply and wastewater discharge, electricity and power, environmental licensing, and construction and registration permits.

Deliverable: Detailed report on the work performed under this task, including the findings of the site assessment clearly identifying site advantages and how those could be capitalized on, and site deficiencies with proposed measures to overcome obstacles.

**Task 5: Facility and Equipment Requirements**

46 MW Power Plant - Based on the estimate for electricity and thermal energy demand from Task 3 above, and the technology screening results from Task 2 above, the Contractor shall review and comment on the PDP for eSolar's 46 MW preliminary design, and its application to the Ma'an Project under development by the Grantee in Jordan. The Contractor will use the PDP in its review of eSolar's technology and the applicability of eSolar's 46 MW design for the Ma'an Project. The Contractor's analysis shall focus on the following elements, which will be included in the PDP, and perform the necessary analysis for the localization of the PDP for the specific site in Ma'an:

- General arrangements
- Building drawings
- Piping and instrumentation diagram
- Process flow diagram
- Material and energy balance
- Major equipment list with sizing

- Major equipment specifications
- One-line diagrams
- Control system single line diagrams
- Instrument Index

The Contractor shall review the PDP and apply its principles to the specific needs of Jordan and the Ma'an Project. The Grantee shall ensure that the Contractor receives a copy of the PDP study from eSolar on or before two months (60 days) have passed following the completion of Task 4. If the PDP is not provided to the Contractor by this time, the Contractor shall notify USTDA in writing and USTDA shall cease its funding of the feasibility study and the Grant Agreement shall be terminated in accordance with Clause 18 thereof.

**5 MW Power Plant** - Based on the estimate for electricity and thermal energy demand from Task 3 above, and the technology screening results from Task 2 above, the Contractor shall evaluate a 5 MW demonstration plant in Jordan. The design of the 5 MW plant will be based on the analysis performed on the 46 MW plant and shall allow for the eventual phasing of the 46 MW plant for the Ma'an project. The Contractor shall describe the tasks required to develop this 5 MW plant, including all activities needed to complete a preliminary design of equivalent level of detail to the 46 MW preliminary designs.

Deliverable: Detailed report on relevant equipment requirements outlining the quantities and technical specifications needed for both the 5 MW and 46 MW CSP plants in Ma'an.

**Task 6: Financial and Technical Analysis**

The Contractor shall conduct a financial and technical analysis for the proposed 46 MW and 5 MW projects. The Contractor shall review and provide comment on eSolar's CSRA for the proposed 46 MW project. This review shall include, but is not limited to, analysis of costs of major plant equipment, construction, utilities (water, and electricity), and operations. The equipment list will be evaluated for the potential for the use of U.S. equipment, supplies, and technologies. The study will also include a list of potential U.S. providers, manufacturers, and equipment suppliers.

The Grantee shall ensure that the Contractor receives a copy of the CSRA study from eSolar on or before two months (60 days) have passed following the completion of Task 5. If the CSRA is not provided to the Contractor by this time, the Contractor shall notify USTDA in writing and USTDA shall cease its funding of the feasibility study and the Grant Agreement shall be terminated in accordance with Clause 18 thereof.

In completion of the financial and technical analysis, the Contractor shall conduct the following tasks:

- i. Using the CSRA study as a model, define any additional requirements for the Ma'an Project above the general parameters of the CSRA. This will include potential differences in the, technical characteristics for the proposed solar energy plant layout including capacity, conceptual design, power generation, water and other resources requirements, equipment requirement, and supplies needed for the maintenance and operation of each proposed plant.
- ii. Develop a project cost breakdown (equipment, materials and installation) to allow for a plus or minus 10% to 30% accuracy range, accounting for local costs for power block equipment and for those elements of the solar field equipment to be provided locally (i.e. those items that will not be provided by eSolar). The Grantee shall provide local costing and local labor productivity information.
- iii. Review and update all implementation and operating costs and benefits of the facility. Estimate the economic internal rate of return (EIRR) on the basis of non-incremental and incremental economic benefits and economic costs (including economic capital, operation, and maintenance costs) in constant economic prices.

- iv. Develop a realistic and competitive fee structure for electricity sales and necessary equipment accessories (covering operation and maintenance costs, depreciation, debt service in excess of depreciation, taxes, and reasonable profit). This shall also include revenues resulting from carbon credits, and an assessment of the adequacy of the draft Jordanian renewables law in terms of tariffs and revenues of the Ma'an Project.
- v. Assess and prepare financial projections for the 5 MW and 46 MW CSP plants including balance sheet, income statement, and cash flow statement in nominal terms covering a period of 25 years. Financial projections will take into consideration the likely effects of inflation and the potential for exchange rate fluctuations.
- vi. Carry out a financial evaluation for each facility over the construction and operation period by calculating the Financial Internal Rate of Return (FIRR) and compare it with weighted average cost of capital (WACC). The FIRR and WACC will be computed using constant 2009 prices, and based on initial interest from financial institutions. The cost estimates and financial projections in nominal terms will be converted to real terms by removing the projected effects of foreign and domestic inflation and currency fluctuations. Incremental costs and benefits will be derived from evaluating the financial position under a with-project and without-project scenario.
- vii. Identify risk factors and test the sensitivity of the Ma'an Project to them, and propose mitigating measures including process guarantees offered by eSolar. Undertake sensitivity analysis by varying charges, costs, implementation delay, and combinations of these factors. The Contractor shall also calculate switching values for these factors, excluding implementation delay and review the sensitivity of the financial viability of the project to future exchange rate movements.

Deliverable: The Contractor shall provide a report of the work performed under Task 6 including detailed financial model including assumptions, input, and results of the financial modeling with all the financial indicators.

#### **Task 7: Implementation Plan**

The Contractor shall develop an Implementation Plan that provides a proposed schedule, cash flow and project execution plan for the various stages, milestones and activities of a single project. This plan will use eSolar's CSRA and PDP as a basis for further analysis on the conditions at Ma'an. In the implementation plan, the Contractor shall develop a cost estimate for potential procurement of goods and services for the implementation of the Ma'an project. This estimate will be supported by a breakdown by category and cost of goods and services necessary for the proposed Ma'an Project.

Additionally, the Contractor shall identify likely sources of financing. The Contractor shall discuss each option with representatives of the World Bank, Islamic Development Bank, USAID, and the Export-Import Bank of the United States, the Overseas Private Investment Corporation, and other international financial institutions that have already made significant investments of time, effort and capital in the Jordanian energy sector. The Grantee will be available to participate in such meetings either telephonically or in person with the Contractor.

The implementation strategy is expected to serve as a key component for the Grantee's business plan and would serve as a business model for future similar projects in Jordan and the region. Therefore the Contractor shall identify the aspects of the project that are replicable and describe potential factors to consider in varying locations. The implementation plan shall be detailed to allow the Grantee to proceed with the tendering phase of the Ma'an project, which is expected to be implemented on a Public Private Partnership basis.

Deliverable: Detailed implementation plan and time table for the Ma'an Project.

#### **Task 8: Institutional Arrangements**

The Contractor shall identify the various institutional arrangements for the ownership, management, and implementation of a solar energy generation plant. The Contractor shall review and analyze the various options such as governmental ownership, private investment/ownership, public-private partnerships, lease-purchase, and others. The assessment will take into account the role of governmental entities such as MEMR, NEPCO, MDC, power generation companies and other non-governmental and private sector entities. The Contractor shall recommend the optimal structure for the Ma'an project.

The Contractor shall analyze the legal framework of the recommended institutional arrangements to ensure its compliance with existing legislation. The assessment will also review and analyze the existing institutional capacities of the various entities involved in the recommended structure to determine any capacity building needs that may be necessary to successfully implement the Ma'an project.

Deliverable: Detailed report on the potential institutional arrangements and a report describing the recommendations of the proposed management/ownership structure.

**Task 9: Review of Legal and Regulatory Issues**

The Contractor shall review and analyze regulatory issues and laws that could impact the viability of the Ma'an Project. The regulatory assessment shall include the national mandates related to renewable energy in general, and solar energy in particular. The Contractor shall identify and describe potential lack of appropriate regulations or implementation incentives.

The Contractor shall review the following documents and any related issues:

- a. Legal environment and applicable laws and regulations and implications on the Ma'an Project (including the new energy law, as well as law for the Development Zone Commission).
- b. PPA with guarantees
- c. Land lease agreement
- d. Loan agreements

The Contractor shall provide its analysis of aspects of the engineering, procurement, and contracting agreement necessary to build the Project, and shall take into account the following:

- a. Incorporation and shareholding agreements
- b. Financing/Project Structures
- c. Prospectus development
- d. Technology licensing and performance guarantees agreements between eSolar and the Grantee

Deliverable: Detailed report of the work performed under Task 9 and of the legal review, including the identification of legislative barriers, if any, and an assessment of the Project legal structure and potential risks.

**Task 10: Preliminary Environmental and Social Analysis**

The Contractor shall conduct a preliminary environmental assessment, focusing on potential impacts of the project on (a) water resource, ecological resources including flora and fauna, (b) cultural heritage sites and relics, (c) soil erosion (d) local community disturbances from construction activities, and (e) possible changes in land use. The Contractor shall describe appropriate mitigation measures, management procedures and monitoring programs, if any. The Contractor shall also conduct a preliminary social impact assessment of the Ma'an Project. Environmental and social issues that may require further analysis and/or mitigation shall be identified by the Contractor.

Deliverable: Preliminary Environmental Impact Assessment and Social Impact Analysis.

### **Task 11: Host Country Development Impacts**

The Contractor will prepare a development impacts analysis to provide the project's decision-makers and interested parties with a broader view of the Ma'an Project's potential effects on the host country. The Grantee shall assist in providing access to the necessary data and information to complete this task. The analysis shall focus on what development impact is likely if the Ma'an Project is implemented according to the study recommendations. While specific focus shall be paid to the immediate impact of the project, the Contractor's analysis shall include any additional developmental benefits that may result from the project's implementation, including spin-off and demonstration effects. The factors to be considered shall include the following:

Infrastructure - The Contractor shall analyze the impact that the infrastructure changes will have both on Jordan nationally and on the locations where solar energy generation facilities are proposed.

Market-Oriented Reform - The Contractor shall provide a description of any regulation, laws, or institutional changes that are recommended and the effect they would have if implemented.

Human Capacity Building - The Contractor shall assess the number and type of local positions that would be needed to construct and operate the proposed Project, as well as the number of local people who would receive training; and shall provide a description of such additional training programs. The consultant shall include an assessment of the multiplier effect on job creation in the energy, water, agricultural, and other relevant sectors.

Technology Transfer and Productivity Enhancement Opportunities - The Contractor shall provide a description of any advanced technologies that would be utilized as a result of the Project. The discussion should include specific examples of efficiencies or other social and environmental benefits gained by the utilization of eSolar's technology.

Other - The Contractor shall describe any other developmental impacts or benefits that would result from the project, for example, follow-on or replication projects, safer workplace, increased good governance or improved financial revenue flows to the Host Country.

Deliverable: Development Impacts Assessment.

### **Task 12: Final Report**

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause H of Annex II of the Grant Agreement. The Contractor shall deliver two hard copies of the Study to the Grantee and a CD Rom including the contents of the final report as provided to USTDA.

#### **Notes:**

- (1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.**
- (2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.**

- (3) The Grantee and USTDA shall have the right to receive all work product that is developed under these Terms of Reference. The Grantee's receipt of such work product shall be subject to any confidential obligations undertaken by the Grantee with respect to eSolar's proprietary information. The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the public version of the Final Report."**

## ANNEX 6

### COMPANY INFORMATION

#### A. Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers:
  
  
  
  
  
  
  
  
  
  
2. Year established (include predecessor companies and year(s) established, if appropriate).
  
  
  
  
  
  
  
  
  
  
3. Type of ownership (e.g. public, private or closely held).
  
  
  
  
  
  
  
  
  
  
4. If private or closely held company, provide list of shareholders and the percentage of their ownership.
  
  
  
  
  
  
  
  
  
  
5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (\*) next to the names of those principal officers who will be involved in the Feasibility Study.
  
  
  
  
  
  
  
  
  
  
6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror's parent(s).

7. Project Manager's name, address, telephone number, e-mail address and fax number .

**B. Offeror's Authorized Negotiator**

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

**C. Negotiation Prerequisites**

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and reflect such impact within the project schedule.
  
2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

**D. Offeror's Representations**

Please provide exceptions and/or explanations in the event that any of the following representations cannot be made:

1. Offeror is a corporation [*insert applicable type of entity if not a corporation*] duly organized, validly existing and in good standing under the laws of the State of \_\_\_\_\_ . The Offeror has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Offeror is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment, or ineligible for the award of contracts by any federal or state governmental agency or authority. The Offeror has included, with this

proposal, a certified copy of its Articles of Incorporation, and a certificate of good standing issued within one month of the date of its proposal by the State of \_\_\_\_\_.

2. Neither the Offeror nor any of its principal officers have, within the three-year period preceding this RFP, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.
3. Neither the Offeror, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.
4. There are no federal or state tax liens pending against the assets, property or business of the Offeror. The Offeror, has not, within the three-year period preceding this RFP, been notified of any delinquent federal or state taxes in an amount that exceeds \$3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.
5. The Offeror has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Offeror has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA retains the right to request an updated certificate of good standing from the selected Offeror.

Signed: \_\_\_\_\_  
(Authorized Representative)

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_