

**REQUEST FOR PROPOSALS**

**FEASIBILITY STUDY FOR THE  
LEBANON CONCENTRATED SOLAR POWER PLANT**

Submission Deadline: **4:00 PM**  
**LOCAL TIME**  
**JULY 27, 2010**

Submission Place: Salim Zeenni  
CEO, Zeenni's Trading Agency  
370, Gouraud Str. Gemmayzeh Area  
Beirut, Lebanon  
Phone: 961-3-331-222 or 961-6-930-130

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.

**N.B.: Any and all questions pertaining to the RFP should be sent to Nina Patel, USTDA,  
1000 Wilson Blvd, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357,  
Fax: (703) 875-4009, [npatel@ustda.gov](mailto:npatel@ustda.gov)**

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## **Section 1: INTRODUCTION**

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US\$338,270 to Zeenni's Trading Agency (the "Grantee"), in accordance with a grant agreement dated May 26, 2010 (the "Grant Agreement"). USTDA has provided a grant to the Grantee to perform the Feasibility Study for the Concentrated Solar Power Plant in Lebanon. 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**

Increasing renewable energy sources is a policy priority for the Government of Lebanon, as the country lacks indigenous sources of energy and imports nearly 99 percent of its energy. High costs and insufficient supplies have led to frequent electricity outages, resulting in significant damage to the economy and the tourism industry. In the electricity sector, the main electricity company, EDL (Electricité du Liban), imports around \$500 million worth of fuel each year to meet its basic energy needs. Government loans of \$200-500 million are annually passed in an effort to prevent EDL from going bankrupt due to inefficiencies and transmission losses. Despite large government investments in the power sector, demand still exceeds supply, and blackouts are common in peak demand times.

Renewable energy currently plays a minor role in the energy mix in Lebanon. Lebanon experiences over 300 days of sunshine a year, making solar energy one of the better alternatives for a renewable energy source. While solar energy has rarely been used to generate electricity, energy savings from the use of solar thermal collectors are widespread in Lebanon. This feasibility study (FS) would follow the success of the solar thermal industry and develop a plan for effectively implementing Concentrated Solar Power (CSP) technology in the Byblos region with good potential for replicating this technology in other areas.

The FS will assess CSP technology and analyze the construction of a 50 MW CSP power plant in the Byblos area of Lebanon. The lack of sufficient service in this area of Lebanon has prompted many businesses to implement self-generation techniques for electricity usage. Such techniques are costly and continue to fall short of meeting energy needs. Except for some small company concessions to generate electricity, EDL monopolizes the generation and distribution market, and the law prohibits electricity generation for sale to the grid. Therefore, the project will generate electricity to sell it directly to industrial estates in the vicinity of the proposed site. The study will include an analysis determining the best CSP technology to use; a techno-economic assessment; engineering, procurement and construction cost estimates; and a project implementation plan for a 50 MW CSP power plant.

A background Definitional Mission is provided for reference in Annex 2.

### **1.2 OBJECTIVE**

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. 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\$338,270. **The USTDA grant of US\$338,270 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\$338,270 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.

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

### **2.1 PROJECT TITLE**

The project is called Lebanon Concentrated Solar Power Feasibility Study.

### **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. A 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\$338,270.

## **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.

## **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:

Salim Zeenni  
CEO, Zeenni's Trading Agency  
370, Gouraud Str. Gemmayzeh Area  
Beirut, Lebanon  
Phone: 961-3-331-222 or 961-6-930-130

**An Original and eight (8) copies of your proposal must be received at the above address no later than 4:00 PM Local Time, on July 27, 2010.**

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 eight (8) 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.

## **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 NINETY (90) 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.

## **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.

## **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 \$338,270, which is a fixed amount.

Offerors shall submit one (1) original and eight (8) copies of the proposal. 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 requested in sections 3.2.5 and 3.2.6 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.
2. 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 \_\_\_\_\_. The Offeror commits to notify USTDA and the Grantee if they become aware of any change in their status in the state in which they are incorporated. USTDA retains the right to request an updated certificate of good standing.
3. 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.
4. 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 3 above.
5. 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.
6. 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.

### **3.2.5 Subcontractor Profile**

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).

### **3.2.6 Subcontractor's Representations**

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

1. Subcontractor 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 subcontractor has all the requisite corporate power and authority to conduct its business as presently conducted, to participate in this proposal, and if the Offeror is selected, to execute and deliver a subcontract to the Offeror for the performance of the Feasibility Study and to perform the Feasibility Study. The subcontractor 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.
2. Neither the subcontractor 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 subcontractor, 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 subcontractor. The subcontractor, 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 subcontractor 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 subcontractor has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected subcontractor shall notify the Offeror, Grantee and USTDA if any of the representations included in this proposal are no longer true and correct at the time of the Offeror's entry into a contract with the Grantee.

### **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:

1. Firms' specific experience related to the assignment: 25 points maximum
  - Firms' overall experience: 15 points
  - Firms' overseas experience: 10 points
2. Adequacy of proposed work plan and methodology in response to the TOR: 25 points maximum

- Knowledge of proposed work and understanding of service: 10 points
- Appropriateness of proposed methodology and workplan: 15 points

3. Qualifications and competence of the key staff for the assignment: 25 points maximum

- Team Leader's experience in similar projects: 5 points
- Project Engineer's experience in similar projects: 5 points
- Mechanical Engineer's experience in similar projects: 5 points
- Electrical Engineer's experience in similar projects: 5 points
- Economist / Financial Analyst's experience in similar projects: 5 points

4. Past performance: 25 points maximum

- Six relevant and verifiable projects: 25 points
- Five relevant and verifiable projects: 20 points
- Four relevant and verifiable projects: 15 points
- Three relevant and verifiable projects: 10 points
- Two relevant and verifiable projects: 5 points

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

Price will not be a factor in contractor selection.

# ANNEX 1

SALIM ZEENNI, ZEENNI'S TRADING AGENCY, 370, GOURAUD STR.  
GEMMAYZEH AREA, BEIRUT, LEBANON, TEL: 961-3-331-222 or 961-6-930-130

### LEBANON CONCENTRATED SOLAR POWER FEASIBILITY STUDY

POC: Nina Patel, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Lebanon Concentrated Solar Power Feasibility Study. 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 a Concentrated Solar Power Plant in Lebanon.

Increasing renewable energy sources is a policy priority for the Government of Lebanon, as the country lacks indigenous sources of energy and imports nearly 99 percent of its energy. High costs and insufficient supplies have led to frequent electricity outages, resulting in significant damage to the economy and the tourism industry. In the electricity sector, the main electricity company, EDL (Electricité du Liban), imports around \$500 million worth of fuel each year to meet its basic energy needs. Government loans of \$200-500 million are annually passed in an effort to prevent EDL from going bankrupt due to inefficiencies and transmission losses. Despite large government investments in the power sector, demand still exceeds supply, and blackouts are common in peak demand times.

Renewable energy currently plays a minor role in the energy mix in Lebanon. Lebanon experiences over 300 days of sunshine a year, making solar energy one of the better alternatives for a renewable energy source. While solar energy has rarely been used to generate electricity, energy savings from the use of solar thermal collectors are widespread in Lebanon. This feasibility study (FS) would follow the success of the solar thermal industry and develop a plan for effectively implementing Concentrated Solar Power (CSP) technology in the Byblos region with good potential to replicate this technology in other areas.

The FS will assess CSP technology and analyze the construction of a 50 MW CSP power plant in the Byblos area of Lebanon. The lack of sufficient service in this area of Lebanon has prompted many businesses to implement self-generation techniques for electricity usage. Such techniques are costly and continue to fall short of meeting energy needs. Except for some small company concessions to generate electricity, EDL monopolizes the generation and distribution market, and the law prohibits electricity generation for sale to the grid. Therefore, the project will generate electricity to sell it directly to industrial estates in the vicinity of the proposed site. The study will include an analysis determining the best CSP technology to use; a techno-economic assessment; engineering, procurement and construction cost estimates; and a project implementation plan for a 50 MW CSP power plant.

The U.S. firm selected will be paid in U.S. dollars from a \$338,270 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 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/businessopps/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.

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 **4:00 PM Local Time, July 27, 2010** at the above address. 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 CLEAN ENERGY AND RENEWABLE ENERGY PROJECTS IN JORDAN AND LEBANON

### FINAL REPORT

#### 1.0 EXECUTIVE SUMMARY

Lebanon lacks also all major traditional sources of energy. Accordingly, 99% of its primary energy needs are imported. In the electricity sector alone, the main electricity company, EDL (Electricité du Liban), imports around \$500 million worth of fuel each year to generate needed electricity. In addition, and despite large government investments in the power sector, demand still exceeds supply and blackouts are common in peak demand times. Losses on the grid are reported to be very high. It is reported that electric losses adding up to 44% mainly due to illegal connections and technical losses. Although this number has been steadily going down in the past couple of years, a significant problem still exists. To partially fulfill this growing need, Lebanon resorts to importing electricity from Syria.

Renewable energy plays a minor role in the energy mix in Lebanon. Its use has been limited to hydropower whose share has been dropping with increased electricity production and consumption to reach 5-12% in recent years, depending on rainfall and thermal plants productivity. Other forms of renewable energy are not being used on a grid scale and few applications may exist in individual houses.

Due to its abundant solar resources and the maturity of the solar thermal industry, Lebanon stands to benefit greatly from the utilization of solar water heating (SWH). While solar energy has rarely been used to generate electricity, energy savings from the use of solar thermal collectors are wide spread. No figures are currently available to quantify the thermal energy collectively produced through these systems.

In Lebanon, the DM team identified another solar project that meets USTDA funding criteria for a 100 MW Concentrated Solar Power (CSP) project in Byblos. The project was identified by Zeenni Industries and Trading Group; a private sector industrial enterprise. Like many other industries in Lebanon, the Zeenni group relies on self generation, which they do by the means of using a conventional steam cycle. The installed generation capacity at Zeenni industries is 2.5 MW. Although sufficient, the unit energy produced by such system is relatively higher than that of other systems due to many factors the most important of which are the fluctuating heavy fuel prices, small scale of the installed unit, and the limitations of the technology used. Therefore, Zeenni industries has started exploring the potential for utilizing solar energy and is in need for the conduct of a detailed feasibility study.

The expected future solar power market in both countries provide excellent opportunities for US companies to invest as part of the two countries' policy to reduce dependence on imported energy. Solar panels and invertors 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 instance, 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 MENA countries 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. The estimated cost of the project in Jordan is \$400 million, which could easily result in US exports between \$30-40 million during the next 5-10 years.

For CSP, the six largest concentrating solar thermal plants in the world have a combined installed capacity of 574 MW. Of those, 493 MW are installed in the US, thus, indicating the dominance of US technologies in the CSP field and the higher potential for US exports than those from other manufacturing countries. US companies shipped slightly less than 17 million square feet of solar thermal collectors in 2008, compared with 15.2 million

square feet in 2007. The export market accounted for 13 percent of total shipments. Based on those statistics, exports valued at \$30 to \$35 million can be easily expected for the project at hand.

## 2.0 Energy Sector in Lebanon

Lebanon is located on the Eastern edge of the Mediterranean. The area is 10,452 km<sup>2</sup> while the population is around 4 million. Lebanon has \$4010 per capita GNI but the national debt is around \$30 billion. This high population density and relatively good standard of living, exerts significant environmental pressures on the land in addition to a large energy demand that has to be met. While Lebanon strives to meet the energy demand of its population, a different approach based on energy efficiency and renewable energy may be the solution. Lebanon is located in a relatively sunny area (2200 kWh/m<sup>2</sup>.yr) and has other potential renewable energy (R.E.) sources, indicating that an investment in these technologies may offset the need to expand the power generation capacity.

Lebanon lacks all major traditional sources of energy. Accordingly, 99% of its primary energy needs are imported. In the electricity sector alone, the main electricity company, EDL (Electricité du Liban), imports around \$500 million worth of fuel each year to generate needed electricity. In addition, and despite large government investments in the power sector, demand still exceeds supply and blackouts are common in peak demand times. Losses on the grid are reported very high. It was reported that electric losses adding up to 44% mainly due to illegal connections and technical losses. Although this number has been steadily going down in the past couple of years, a significant problem still exists. To partially fulfill this growing need, Lebanon resorts to importing electricity from Syria.

Electricity generation and distribution is a monopoly of EDL with some concessions made to smaller companies. On annual basis, EDL uses 573,071 tons of diesel and 1,355,081 tons of heavy fuel oil. This is used to produce electricity at an average cost of \$0.078-0.094/kWh. This value rises and falls depending on fossil fuel derivatives market. Government loans of \$200-500 million are annually passed in an effort to prevent EDL from going bankrupt. The increased costs and spiraling debt, in addition to insufficient supplies have resulted in frequent outages throughout the year, mainly in the summer, resulting in significant damage to the economy and the tourism industry. Despite its troubles, EDL follows a social pricing that provides electricity at low cost for small consumers.

Renewable energy plays a minor role in the energy mix in Lebanon. Its use has been limited to hydropower whose share has been dropping with increased electricity production and consumption to reach 5-12% in recent years, depending on rainfall and thermal plants productivity. Other forms of renewable energy are not being used on a grid scale and few applications may exist in individual houses.

Due to its abundant solar resources and the maturity of the solar thermal industry, Lebanon stands to benefit greatly from the utilization of solar water heating (SWH). While solar energy has rarely been used to generate electricity, energy savings from the use of solar thermal collectors are wide spread. No figures are currently available to quantify the thermal energy collectively produced through these systems.

### 2.0.1 Renewable Energy

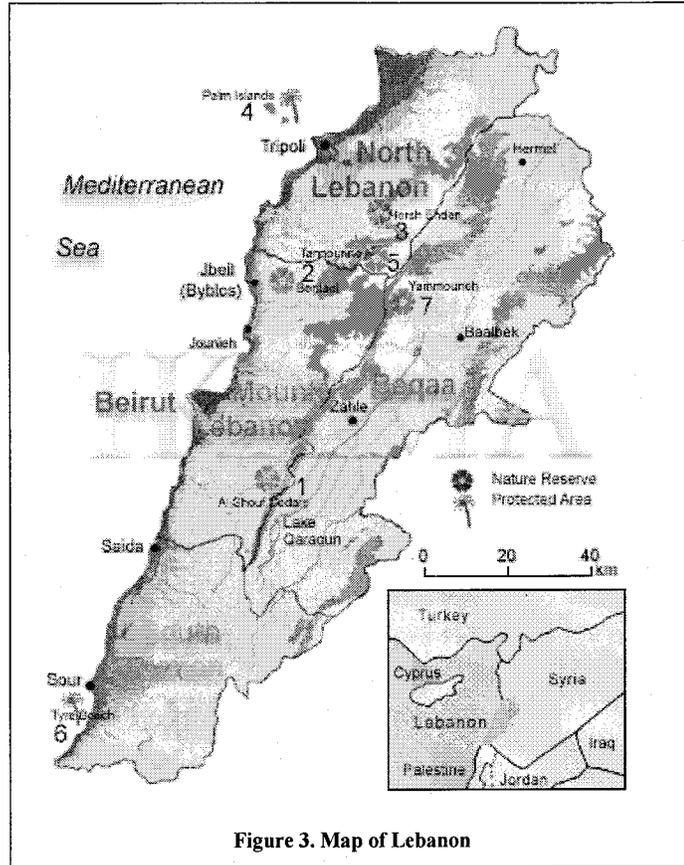


Figure 3. Map of Lebanon

Several renewable energy options exist for Lebanon and in considering the best renewable energy alternative, it is important to consider all potential renewable energy sources, their costs, market availability, suitability for the selected location, significance of the energy produced and return on investment. It is to be kept in mind that no one single option will constitute the overall solution for the current energy crisis but rather a combination of various options, such as wave and tidal, geothermal, biomass, hydro electric, solar insulation, and wind energy.

Although Lebanon is a small country and has little forest cover, it has significant other sources of biomass, namely municipal solid waste (MSW). If burnt, the 400 tons of MSW produced on a daily basis could provide 30% of the electricity needs, however, due to lack of emission controls and a strong resistance from locals and NGO's this alternative is not being considered. As a matter of fact, in a country like Lebanon with little natural resources, MSW is far more valuable if the raw material is recovered and recycled. Glass, paper, aluminum and some types of plastics are examples of material that can be completely recycled locally. Biogas generation from sewer and farm waste decomposition has the potential of offsetting 2.8% of the electric needs. Some plans are currently under way for large scale utilization of biogas on a dairy farm. Three main sources of biofuel will be discussed: waste (mostly organic), biogas from residential and farming waste, and biodiesel.

Privatization of the energy production sector has proven that it can increase the adoption of renewable energy. Nevertheless if the privatization process is not done properly, privatization can lead to monopoly and other bad practices.

Around the World, examples show that renewable energy has only been able to kick-start when there is a national or local authority supporting it. The Lebanese government has to understand the benefits of a long-term sustainable development strategy and a sustainable energy strategy. It has been proven that energy security can only be achieved with the adoption of an aggressive renewable energy and energy efficiency strategy.

Lebanon also has to start getting involved in climate politics, and the government has to fully understand this issue and its impact on the country. A recent study released at COP12 in Nairobi has shown that mitigating the climate change impact of one ton of CO<sub>2</sub> will cost us 85 US dollars, while the cost of reducing this one ton, by renewable energy and energy efficiency, is only 25 US dollars.

Renewable energy plays a minor role in the energy mix in Lebanon. Its use has been limited to hydropower whose share has been dropping with increased electricity production and consumption to reach 5-12% in recent years, depending on rainfall and thermal plants productivity. Other forms of renewable energy are not being used on a grid scale and few applications exist in individual houses. The following summarizes main areas for renewables in Lebanon: Following are the renewable energy sources in Lebanon:

### **Hydropower**

The significance of utilizing water to generate electricity has been locally recognized for a long time. Accordingly, several hydropower plants have been installed while others were studied and planned. Hydropower generation varied from 273 GWh to 1204 GWh with an average of 722 GWh over the past 20 years. This can be readily attributed to increased water consumption for expanding domestic, industrial and agricultural applications, in addition to decreasing rains. Relatively strong rivers like Litani, Qadisha and Ibrahim have more than one hydropower plant on their path. Also, these plants are generally old varying between 36 and 71 years old. General efficiencies for similar, properly maintained, systems are reported to be around 75%.

### **Geothermal Energy**

Three tentative sites have been identified that may carry some economic value. The first is in the town of Sammaqiye near the Syrian border. This area belongs to the general District of Akkar, which used to be an active volcanic area a long time ago. This ancient activity is illustrated in the volcanic rock commonly found in the area. In the early 1970's, a well was dug down to around 550 m and 70°C hot water, rich in sulfur, erupted to a height of 30 m above ground. Another case of hot underground water was observed in the town of Qubayat (also in Akkar). Both of these sites have not been developed yet. While both sites do not provide water hot enough to generate electricity, they could serve to offset some of the water and space heating needs. The Third site is off the shore of Tyre in Southern Lebanon where thermal vents have been discovered covering an area of 800 m at a depth of 60 m below sea level.

## **Solar Energy**

With the majority of towns and villages connected to the electric grid, solar photovoltaic (PV) in its current status is not economical and cannot compete with electricity supplied with the traditional oil-based methods. An exception exists for isolated remote applications such as transmission and relay towers. Some attempts by solar power enthusiasts and some municipalities have been installed but are not considered to be cost efficient especially when compared to the subsidized electricity prices. Needless to say, none of the options under development today such as solar towers and solar concentrators are installed or even being considered at any level as a means to produce electricity.

Solar thermal collectors are wide spread and their market is growing with increasing fuel prices. The market is still expected to grow and according to the Lebanese Solar Energy Society (LSES) figure 10 is suggested to show the future market of SWH systems. Any effort by the government or local NGO's to promote these systems will greatly and rapidly enhance their use. The extent of the success of SWH systems is a direct function of government regulation.

## **Wind Energy**

There is significant evidence to support the presence of strong sustained winds in various areas in Lebanon, specifically the north. This evidence is mainly based on the tree deformation index, which suggests speeds of 7-8 m/sec to be present in selected sites. With the absence of a wind map for Lebanon, attempts at measuring the wind have been done on small scale and by individuals or small organizations. Few individual attempts have been made at installing small wind turbines (100's of watts) in the south, Mount Lebanon and Beqaa. Some of these systems were self made while others were installed by wind enthusiasts for private use and without prior detailed studies of winds in the area.

The largest wind turbine installed is a 300 kW wind turbine installed in the area of Ammiq which also suffers from the lack of prior wind studies which has resulted in its sitting idle most of the time. Another 7.5 kW wind turbine was installed in the area of Khiam, South Lebanon, but was felled by the most recent bombing in the south. With wind energy growing more competitive every day, wind turbine installation preceded by a good wind-monitoring plan seems to be the future.

However with the strongly regulated electricity generation and distribution system existing in Lebanon, and due to the monopoly of one company on electricity (EDL), it is up to the government to promote and install wind farms and connect them to the grid. A regulatory change could open up the market for entrepreneurs fairly rapidly; especially that electricity generation in Lebanon is relatively expensive.

## **Biomass**

Limited space in Lebanon and high population density 413 person/km<sup>2</sup>, in addition to inappropriate weather conditions have made Biofuel use in Lebanon a very limited process. The scarce amounts of water available are poorly managed and water rationing is common. Being dependent on food imports from abroad, any water available is quickly directed to the use of deserted lands for food production. Therefore the use of land to simply generate biomass is not a wise decision. However, with proper management, one can find several sources of energy within the Biofuel context. Due to its relatively low energy demand: 4,963,000 tons of fuel, and 1650 MW of electricity, effective solutions offsetting a significant portion of the energy bill can be readily developed.

Currently Biomass use is restricted to traditional wood harvesting for coal and firewood. This is an inefficient method of forest product use in addition to the destructive effects it is having on forested areas in Lebanon. In addition, some trial projects for the generation of biogas from animal wastes have been constructed but are generally used for heat generation and not for electricity.

### **2.1 DM Focus and Structure**

With continued support to the Energy Sector in the MENA region, USTDA decided to sponsor this DM to evaluate renewable energy projects in Jordan and Lebanon. 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 clean and renewable energy

related activities in Jordan and Lebanon, as well as identify other potential relevant sectoral projects for USTDA financing.

During the DM mission, meetings were conducted with government and sector officials, and with officials from the US Embassy and USAID. The DM team also conducted the needed analysis and stakeholder interviews needed to give a technical recommendation to USTDA on the viability of the identified projects.

This Definitional Mission Report is based on IdRC-US's trips to the host country, phone interviews and meetings with US 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 References and it is presented in a format that conforms to USTDA's general guidelines for DM Reports.

The DM Team deployed in Jordan in March, 2003 and conducted two visits to Lebanon in March and April, 2010. During the Jordan and Lebanon visits, several phone interviews and meetings phone interviews and meetings with US 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.

## **2.2 Technical Assistance for A CSP Solar Power Generation Plant in Lebanon**

Solar power technologies convert sunlight into electricity through concentrating solar thermal devices, or various other technologies. Concentrated solar power (CSP) systems use lenses or mirrors to focus a large area of sunlight onto a small area. Electrical power is produced when the concentrated light is directed onto photovoltaic surfaces or used to heat a transfer fluid for a conventional power plant. Such systems would help in reducing dependence on conventional power generation schemes and thereby save some of imported fuel and resulting combustion emissions.

The project at hand aims to assess CSP technology and how to utilize it in the Byblos area of Lebanon, and to further study other relevant variables such as optimum facility size, technical specifications etc., and assessing prospects of the scheme in the proposed area. This would have some positive impacts on both of energy and environmental image in Lebanon.

The geographic distribution of total solar radiation on a global scale is divided in terms of intensity into four broad belts around the earth. The most favorable belt lies between latitudes 15°N, and 35°N, and embraces the regions that are naturally endowed with the most favorable conditions for solar energy applications. These semi-arid regions are characterized by having the greatest amount of solar radiation, more than 90% of which comes as direct radiation because of the limited cloud coverage and rainfall (less than 250 mm per year). Moreover, there is usually over 3,000 hours of sunshine per year. As can be seen in the Figure, Lebanon lies among this belt. With its shortage of electricity and frequent electricity black outs, solar energy is one of the best alternatives for renewable and alternate energy sources.

### **2.2.1 Project Concept**

The project at hand was identified by Zeenni Industries and Trading Group; a private sector industrial enterprise. Like many other industries in Lebanon, the Zeenni group relies on self generation, which they do by the means of using a conventional steam cycle. The installed generation capacity at Zeenni industries is 2.5 MW. Although sufficient, the unit energy produced by such system is relatively higher than that of other systems due to many factors the most important of which are the fluctuating heavy fuel prices, small scale of the installed unit, and the limitations of the technology used. Therefore, Zeenni industries has started exploring the potential for utilizing solar energy. An investment in CSP for 2.5 MW generation capacity is not very viable, therefore, Zeenni industries started investigating the viability of a larger CSP plant (currently estimated at 50 MW) in order to supply their establishment and sell electricity to other industries in their vicinity. Except for some small company concessions to generate electricity, the generation and distribution is a monopoly of EDL, and the law prohibits electricity generation in order to sell it to the grid. Therefore, the concept of the project is to generate electricity and sell it directly to industrial estates in the vicinity of the proposed site, or to sell it directly to one of the Lebanese concessionaires that has a concession for the area in which the project is proposed, thus, overcoming the prohibition of selling electricity to the grid.

The main theme of the proposed project is to conduct a detailed assessment for the implementation of CSP technology in the Byblos area of Lebanon, and to identify the specific needs of such a solar power facility, which could help in reducing dependence on self generation, inconsistent supply by the grid, and increasing

dependence on a free and clean source of solar energy that would relieve some of hard currency due to increasing expenditure on imported energy.

Although still in need of some legislative reforms, the GoL is committed to increasing the share of indigenous energy resources, including renewables. 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. This will include a 50MW project or more. The study will include technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, 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 Lebanon, project costs, site conditions, facilitation of meetings, and financing market opportunities).

### **2.2.2 International Best Practices**

Between 1970 and 1983, solar power systems. Dropping oil prices in the early 1980s moderated the growth of solar technologies from 1984 to 1996. Since 1997, solar technology development has accelerated again due to supply issues with oil and natural gas, global warming concerns, and the improving economic position of such technologies relative to other energy technologies. For example, photovoltaic 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.

Concentrated solar power systems are divided into

- Concentrated solar thermal (CST) which is used to produce renewable heat or electricity through steam. CST systems use lenses or mirrors and tracking systems to focus a large area of sunlight onto a small area. The concentrated light is then used as heat or as a heat source for a conventional power plant (solar thermoelectricity). A wide range of concentrating technologies exist, including the parabolic trough, Dish Stirling, Concentrating Linear Fresnel Reflector, Solar chimney and solar power tower. Each concentration method is capable of producing high temperatures and correspondingly high thermodynamic efficiencies, but they vary in the way that they track the Sun and focus light.
- Concentrated photovoltaics (CPV) systems, which employ sunlight concentrated onto photovoltaic surfaces for the purpose of electrical power production. Solar concentrators of all varieties may be used, and these are often mounted on a solar tracker in order to keep the focal point upon the cell as the Sun moves across the sky.
- Concentrating Photovoltaics and Thermal (CPVT) technology that produces both electricity and thermal heat in the same module. Thermal heat that can be employed for hot tap water, heating and heat-powered air conditioning (solar cooling), desalination or solar process heat.

A study done by Greenpeace International, the European Solar Thermal Electricity Association, and the International Energy Agency's SolarPACES group investigated the potential and future of concentrated solar power. The study found that concentrated solar power could account for up to 25% of the world's energy needs by 2050. Also, with this expansion of concentrated solar power, thousands of new jobs would be created and millions of tonnes of carbon dioxide would be prevented from being released. The increase in investment would be from \$3 billion worldwide to \$130 billion in that time period. Although Spain is the leader in concentrated solar power technology, with more than 50 projects approved by the government in the works, there are a number of US entities that are significantly active in the CSP.

### **2.2.3 About the Grantee, Their Level of Commitment, and Grantee Contact Info**

This project was presented to USTDA by the Lebanon based group Zeenni Industries and Trading. The CEO of Zeenni Industries and Trading is the main contact point for the project; his contact information is below.

**Salim Zeenni-CEO**  
Zeenni Industries and Trading  
**Telephone: +961 333 1222**  
**e-mail: [zeenni@zeenni.com](mailto:zeenni@zeenni.com)**

### **2.2.4 Implementation Financing**

Implementation financing for solar power generation plant in Lebanon has not yet been determined. The grantee is committed to partially funding the project privately. The proposed study will seek to better understand the financing prospects and structure for the project, as the financial crisis settles and bank and private sector appetite for new technology risk is better understood.

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 energy sector in the MENA region. 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. Initial discussions with the IFC revealed interest in financing energy projects in the region that are implemented through the private sector, which is the case for the project at hand. Just recently, the Export-Import Bank of the United States (Ex-Im Bank) has launched its new "Solar Express" product that will provide streamlined financing for US exports to small solar-energy projects that could be approved in as few as 60 days. The Ex-Im bank is another potential source for financing of such projects.

### ***2.2.5 US Export Potential and Foreign Competition***

The most critical component in solar power systems is the panels, the tracking system, storage and invertors to be used. The expected future solar power market in Lebanon provides an excellent opportunity for US companies to invest as part of the trend to reduce dependence on imported energy. The panels, tracking and storage systems in a solar power system are basic components to achieving such objectives. Some US Companies such as eSolar, GE and AEE have already established a presence in the region for the supply of different systems. It is companies like those, in addition to other companies such as ENXCO, SCHOTT Solar, and others that can play a significant role in the supply of necessary equipment for the Lebanese solar power schemes. Once the ToR for the proposed study has been finalized, the DM will contact those, and other US suppliers to develop and understanding of their interest in the Lebanese market.

The project will rely on many imported equipment including:

- The power block – steam turbine and cooling towers/equipment
- Receiver towers and camera towers could be manufactured locally
- The receivers (boilers) themselves will be supplied by the panels manufacturer(s)
- Mirrors tracking technology and software supplied by manufacturer(s)
- Piping, vessels, insulation and control systems

Recent CSP projects implemented around the world reveal an investment cost of \$4,000 per MW of installed capacity. Given the lower labor cost in MENA, the investment cost in Lebanon can be expected to be lower. Using an investment cost of \$3,000 per MW of installed capacity results in an estimated investment cost of \$150 million for the 50 MW CSP power plant. It is estimated that nearly one third of the components could be manufactured or purchased locally. The value of the imports for the project are estimated at \$80 to \$100 million.

The six largest concentrating solar thermal plants in the world have a combined installed capacity of 574 MW. Of those, 493 MW are installed in the US, thus, indicating the dominance of US technologies in the CSP field and the higher potential for US exports than those from other manufacturing countries. There were 74 US manufacturers and/or importers active in manufacturing, importing, and/or exporting solar thermal collectors in 2008. This is a significant increase from the 60 companies operating in 2007. These companies shipped slightly less than 17 million square feet of solar thermal collectors in 2008, compared with 15.2 million square feet in 2007. Export shipments totaled 2.2 million square feet in 2008. More than 2.1 million square feet, or 94 percent of total exports, were low-temperature solar thermal collectors. The export market accounted for 13 percent of total shipments. Based on those statistics, exports valued at \$30 to \$35 million can be easily expected for the project at hand.

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 the region, US companies have a competitive opportunity to bid on supplying the required equipment. Discussions with the grantee and various representatives in Lebanon 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.

### ***2.2.6 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.

### ***2.2.7 Impact on US Labor***

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

### ***2.2.8 Justification***

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

- USTDA involvement in the study will enhance the US service provider since the study technology due diligence, techno-economic assessments, engineering, procurement and construction cost estimates, and project implementation planning. This is will lead to the transfer of technology.
- The USTDA involvement will be supported by the GoL, since the Lebanese Government strategy in regard to the renewable energy is to increase the production of electricity by 12% in the 2012.
- Initial involvement will encourage the US manufacturers and supplier to promote their products and services in the field of CSP. It is estimated that the value of export for such project will reach a value of \$30 to \$35 million.

# 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

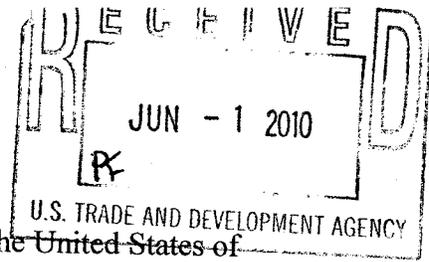
“Source” means the country from which shipment is made.

“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 Zeenni's Trading Agency ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US\$338,270 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed Concentrated Solar Power Plant Project") in Lebanon ("Host Country").

PDF: CK  
SS  
VF  
PH  
KK  
JJ  
MB

## 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 U.S. firm selected by the Grantee ("Contractor") under which the 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.

CS: LZ  
JW  
PD

## 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

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

## **5. USTDA as Financier**

### **(A) USTDA Approval of 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 and/or approval.

### **(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 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 May 25, 2012, 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, I, and J.

## **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 I 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 Chief Executive Officer). 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: Salim Zeenni  
CEO, Zeenni's Trading Agency  
370, Gouraud Str. Gemmayzeh Area  
Beirut, Lebanon

Phone: 961-1-442551

Fax: 961-1-564677

Email: [Zeenni@zeenni.com](mailto:Zeenni@zeenni.com)

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 10/11 1001

Activity No.:2010-21035A

Reservation No.:2010210034

Grant No.:GH 2010210015

### **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.

**[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK]**

IN WITNESS WHEREOF, the Government of the United States of America and Zeenni's Trading Agency, 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 Zeenni's Trading Agency**

By: 

By: 

Date: 05/26/10

Date: 5/26/2010

**Annex I -- Terms of Reference**

**Annex II -- USTDA Mandatory Clauses**

## Annex I

### **Terms of Reference**

The objective of the FS is to assess CSP technology and analyze the construction of a 50 MW CSP power plant in the Byblos area or any other Lebanese industrial region. It is expected that the Project would generate electricity to sell it directly to industrial estates in the vicinity of the site. The FS shall include an analysis determining the best CSP technology to use; a techno-economic assessment; engineering, procurement and construction cost estimates; and a project implementation plan for a 50 MW CSP power plant.

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

The Contractor shall travel to Beirut, Lebanon to meet with the Grantee to discuss the 50 MW Concentrated Solar Power (CSP) project and its objectives. The Contractor shall develop a clear and comprehensive understanding of the planned governmental activities and national strategy related to solar and renewable energy projects in Lebanon.

The Contractor shall also meet with other relevant stakeholders in Lebanon. This shall include but is not limited to:

- Ministry of Water and Energy (MoWE),
- Electricite Du Liban,
- Ministry of Environment,
- Relevant Chambers of Industry and large scale industries,
- United Nations Development Program (UNDP) energy program at the Ministry of Water and Energy, and
- Other stakeholders suggested by the Grantee.

During the meetings in Lebanon, the Contractor shall gather and review relevant studies and data provided by MoWE and other relevant Ministries, the World Bank, USAID projects, and other donor-funded project reports on solar and renewable energy projects in Lebanon such as the UN Economic and Social Commission for Western Asia.

The Grantee shall make available to the Contractor available details regarding their previous efforts (i.e., the Grantee's ongoing efforts for a 2.5 MW CSP, and other relevant research and studies the Grantee has undertaken) in the solar energy sector in Lebanon and other details required to analyze the development of the sector in Lebanon.

Furthermore, the Contractor shall identify additional information from the Grantee and other relevant entities to complete the Study. The Contractor shall prepare an excel spreadsheet outlining the additional information required.

**Deliverable:** The Contractor shall provide a report on the findings of the initial meetings, documentation of all gathered information and previous studies, and a detailed work plan.

## **Task 2: CSP Technology Screening and Evaluation**

The Contractor shall describe the status of CSP technology applications and developments and solar thermal power technologies that may be pertinent to Lebanon. The Contractor shall provide a brief description of each technology, including a summary of technology characteristics, and any 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 Contractor shall conduct a technology screening exercise that includes a comparative analyses of CSP solar technologies (e.g., concentrated solar thermal (CST), concentrated photovoltaics (CPV), concentrating photovoltaics and thermal, and others) versus those of the various other commercially available solar technologies as it relates to Lebanon's conditions. The Contractor shall prepare a detailed description of each type of technology as well as a comparative assessment of each technology against a set of criteria that pertains to Lebanon and the proposed project location, such as altitude, sun related data, infrastructure requirements, resources requirements (e.g., water, labor, etc.). The purpose of these analyses is to determine the suitability of CSP technology for solar power generation given the local conditions. The Contractor shall review 5 to 7 available technologies of the purposes of this task.

For the each of the CSP technologies/options, the Contractor shall conduct the following:

- a) Undertake a detailed techno-economic review of the various CSP technologies;
- b) Develop and document the methodology for technologies' performance measurement and technology performance evaluation. For each screened technology, the Contractor shall describe the technical means with which the performance of such technology is evaluated in order to continuously monitor and evaluate its productivity, efficiency, etc.;
- c) Review and identify any relevant Intellectual Property Rights (IPR) and technology concepts;
- d) Perform systems' integrity reviews (equipment operations, control and maintenance issues) based on a review of components and equipment, quality assurance and reliability information, as well as any operating experience various CSP manufacturers have to date. The Contractor shall utilize an extensive literature review of published information on different technology applications, in addition to information that manufacturers are willing to provide to the Contractor;

- e) Compare the energy conversion efficiency factors for the various technologies based on previous documented data measurements and documented case studies and experiments;
- f) Extrapolate solar efficiency and field performance provided by various CSP manufacturers based on actual plants that would resemble the proposed site in Lebanon;
- g) Review and comment on the proposed technology licensing agreements that would have to be negotiated between manufacturers and the Grantee, if any;
- h) Identify technology and operations risk areas and mitigation as it relates to project yield, as well as capital and operating expenses;
- i) Provide details and literature on actually operating solar power plants that utilize CSP technologies under overall conditions that are similar to Lebanon's; and
- j) Explore the available storage technologies and examine its feasibility to overcome energy intermittency to grid connectivity.

The Contractor shall examine the various solar CSP electricity generation technologies, undertake analysis of those that could reasonably be considered suitable for commercial power generation in the study area, and identify a preferred technology for further evaluation in this feasibility study. In addition to the factors above, the Contractor shall identify the most appropriate technology that takes into consideration the status of the technology and commercial experience, the solar resource in the study area, costs, and any associated risks. The Contractor shall also consider additional criteria in the comparative analyses such as average unit plant capital cost, average unit operation and maintenance costs, average unit levelized electricity, average unit land requirements, and annual capacity factors.

**Deliverable:** The Contractor shall prepare a report detailing the findings of the work performed under this Task 2. The Contractor shall prepare a detailed justification of why the selected technology is best suited for the proposed project in Lebanon.

### **Task 3: Electricity Demand Market and Utility Connection Requirements**

To determine the optimal phasing for implementing the proposed Project up to its full capacity, the Contractor shall conduct a detailed analysis of electricity consumption histories of the industries housed in the vicinity of the proposed site. These industries would potentially constitute future buyers of electricity from the proposed Project. With assistance from the Grantee, the Contractor shall also obtain consumption data from the electricity concessionaire the Byblos region or any other Lebanese industrial region.

The Contractor shall determine the trends in demand growth for the industrial users, and the growth trends in the available sources for meeting those demands (including own generation, national grid, etc.).

The Contractor shall also collect and document technical information on the network needs in the area that would be utilized to transmit electricity from the proposed Project to the potential buyers of electricity in the area. This shall include the transmission and distribution network, substations, and any relevant infrastructure in the area of the project.

Based on the above analysis and the demand projections for the proposed area that could be fully/partially met through the proposed Project, the Contractor shall determine the phasing for implementing the Project up to its full generation capacity and further future expansions.

Finally, the Contractor shall study in detail the various technical, financial, and legislative requirements for connecting the proposed Project to a local grid that would supply the buyers in the study area.

**Deliverable:** The Contractor shall prepare a report on the work performed in this Task 3. The report shall detail all assumptions made for the various scenarios related to electricity consumption generation, and demand projections.

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

Although the Grantee has identified a proposed location for the Project, the Contractor shall conduct an assessment of the proposed area in order to determine its adequacy for the proposed Project. The Contractor shall determine any improvements needed for the infrastructure requirements and servicing, site preparation, local utility grid connection and capacity. The Contractor shall conduct a site assessment that clearly identifies site advantages and how those could be capitalized on, as well as site deficiencies with proposed measures to overcome them. The Contractor shall also assess two other sites within the proposed vicinity. The approach for the site assessment shall cover a number of issues including, but not limited to, the following:

- Size sufficiency for possible development of a solar power plant;
- Clearance and shading from vegetation, structures, hills, or other factors;
- Orientation and topography (gradient);
- Availability and/or suitability for access roads to all parts of the site;
- Proximity to high voltage transmission network;
- Access to water supply and waste water disposal for operation and maintenance and other services;
- Appropriate separation from domestic residences and noise and visual impact-sensitive areas;
- Proximity to sources of dust which could obscure sunlight and coat panel surfaces with a film that would reduce plant efficiency;
- Appropriate zoning and environmental considerations;

- Connection points as part of the selection process; and
- Substation location and inverters positioning within the plant.

Furthermore, the Contractor shall work with the relevant Ministries to obtain data from the nearest weather station. The Contractor shall analyze this meteorological data as well as other insulation data. The Grantee shall work with the Contractor to ensure they have access to the pertinent data and information.

Finally, the Contractor shall prepare a summary description of the required licensing and permitting procedures including water supply and wastewater discharge, electricity and power, substation connection requirements, environmental licensing, and construction and registration permits.

**Deliverable:** The Contractor shall prepare a detailed report on the findings of the site assessment.

### **Task 5: Facility and Equipment Requirements**

Based on the estimate for demand and the technology screening results, the Contractor shall prepare a conceptual design and preliminary technical specifications for the proposed facility's requirements. This shall include the following:

- Design basis and philosophy
- Process and technology/equipment description and options
- Mass and system utility balance
- System performance and specification
- Key equipment sizing and specification (for local conditions)
- Technical and conceptual design drawings and supporting calculations for the selected technology to include the following:
  1. Field piping optimization
  2. Electrical distribution optimization
  3. Plant reliability
  4. Variable speed drives
  5. Cooling system study (wet vs. dry vs. hybrid cooling)
  6. Cooling tower location
  7. Compressed air system
  8. Modularization and containerization
  9. Heliostat field ground preparation
  10. Wastewater treatment
- The conceptual design includes:

1. General arrangements
2. Building drawings
3. Piping and instrumentation diagram
4. Process flow diagram
5. Material and energy balance
6. Major equipment list with sizing
7. Major equipment specifications
8. One-line diagrams
9. Control system single line diagrams
10. Instrument Index

**Deliverable:** The Contractor shall prepare a detailed report on the work performed under this Task 5. The Contractor shall include all design reports and calculations, as well as the conceptual drawings developed under this task.

#### **Task 6: Financial and Technical Analysis**

The Contractor shall conduct a financial and technical analysis for the proposed project.

The Contractor shall do the following:

- i. Define all technical characteristics for the proposed solar energy plant layout including capacity, conceptual design, power generation water and other resources requirements, equipment requirements, and supplies required for the maintenance and operation of proposed plant. The Contractor shall include the full costs of all required infrastructure and equipment, construction, utilities, costs of operations, as well as predicted sales of electricity and improved electricity availability for various activities in the area such as industry, recreation, and tourism;
- ii. 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;
- iii. 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 less those geared towards the environmental fund of Lebanon. Furthermore, the Contractor

- shall conduct an assessment of the carbon emissions produced using conventional power generation scheme prevalent in Lebanon for the same power generation capacity. The Contractor shall take this into account in the financial analysis in terms of carbon credit trade off's and other incentives;
- iv. Assess and prepare financial projections for the Project over 20 years of operation including balance sheet, income statement, and cash flow statement in nominal terms covering a period of 20 years. The Contractor shall explain in detail the assumptions made in the financial statements. Financial projections shall take into consideration the likely effects of inflation, the potential for exchange rate fluctuations and the reduced efficiency of the plant with time;
  - v. Carry out a financial evaluation for the 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 shall be computed using constant 2010 prices. The cost estimates and financial projections in nominal terms shall be converted to real terms by removing the projected effects of foreign and domestic inflation and currency fluctuations. The Contractor shall derive the Incremental costs and benefits from evaluating the financial position under a with-project and without-project scenario;
  - vi. Identify risk factors (e.g. variations in sunshine days and daylight durations) and test the sensitivity of the project to them, and propose mitigating measures. The Contractor shall undertake a sensitivity analysis by varying charges, costs, implementation delay, and combination of these factors. The Contractor shall also calculate the switching values for these factors, excluding implementation delay. The Contractor shall review the sensitivity of the financial viability of the project to future exchange rate movements; and
  - vii. Undertake a financial management requirements assessment of the Grantee which shall include (a) corporate planning and budgetary control, (b) financial and management accounting, and (c) internal control and audit system.

**Deliverable:** The Contractor shall prepare a report describing all the work performed under this Task 6, including the technical analysis and 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 time table, cash flow and Project execution plan for the various stages, milestones and activities of the Project. This plan will use the conceptual design developed in Task 5 as a basis. The Contractor shall prepare a comprehensive list and develop an estimate of potential procurement of U.S. equipment and technology, engineering procurement and construction (EPC) contractors, as well as their level of interest in the Project.

Additionally, the Contractor shall help Grantee identify likely sources of financing. Grantee shall discuss each option with representatives of the World Bank, Islamic Development Bank, USAID, International Finance Corporation, 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 Lebanese energy sectors. The Contractor shall be available to participate in such meetings in the United States, or through telephone calls, with the Grantee.

The implementation strategy is expected to serve as a key component of the business plan (that will be developed by Grantee), and would serve as a business model for future similar projects in Lebanon and the region. The Contractor shall finalize the implementation plan with the Grantee.

**Deliverable:** The Contractor shall prepare a detailed implementation plan and time table for the 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 explore and study the various options such as private investment/ownership, public-private partnerships, lease-purchase, and others.

The Contractor shall prepare an analysis of the legal framework required to ensure the compliance of the proposed institutional arrangement within existing legislations. The Contractor shall also address the institutional capacities of the various entities to determine any capacity building needs.

**Deliverable:** The Contractor shall prepare a detailed report on the institutional arrangements including recommendations of the proposed management/ownership structure.

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

The Contractor shall review and analyze all regulatory issues that could impact the viability of the project. This shall include the national mandates related to renewable energy in general, and solar energy in particular. The Contractor shall also review Law 462 and clearly describe any appropriate regulations or implementation incentives that may be necessary to supplement such law.

The Contractor shall also discuss the following issues:

- a. Legal environment and applicable laws and regulations and implications on the project, including the potential risks;
- b. Incorporation and shareholding agreements;
- c. Prospectus development;
- d. Power Purchase Agreements with guarantees for potential buyers (i.e., the industrial estate in the proposed Project area or the electricity concessionaire in the Byblos region);
- e. Technology performance guarantees agreements;
- f. Land lease agreement with the private owner of the property; and
- g. Loan agreement.

**Deliverable:** The Contractor shall prepare a detailed report with the findings of the legal and regulatory review.

#### **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, ((b) soil erosion (c) local community disturbances from construction activities, and (d) possible changes in land use. The Contractor shall outline appropriate mitigation measures, management procedures and monitoring programs, if any. The Contractor shall also conduct a preliminary social impact assessment of the project. The Contractor shall consider the following:

- Area required for the solar panels and the consequent impacts on visual amenity and local flora and fauna; and
- Reflections from the solar panels field.

**Deliverable:** The Contractor shall prepare a report describing the preliminary environmental and social analysis. The Contractor shall also include the environmental and social issues that may require further analysis and/or mitigation.

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

The Contractor shall prepare a developmental impact analysis to provide the Project's decision-makers and interested parties with a broader view of the Project's potential effects on the host country. While specific focus shall be paid to the immediate impact of the Project, the Contractor shall also analyze 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 describe the infrastructure built as a result of Project implementation. The Contractor shall also analyze the impact that the infrastructure changes will have both on Lebanon 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 need to receive training; and shall provide a description of such additional training programs. The Contractor shall include an assessment of the multiplier effect on job creation in the energy, water, agricultural, and other sectors.

Technology Transfer and Productivity Enhancement Opportunities - The Contractor shall identify efficiency gains as a result of the Project as well as describe the transfer of technology to Lebanon.

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:** The Contractor shall prepare a report describing the developmental impact of the Project.

**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 I of Annex II of the Grant Agreement. The Contractor will provide both the Grantee with 6 copies of the final report on CD-ROM in English.

**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 an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**

## Annex II

### USTDA Mandatory Contract Clauses

#### A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or 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 Zeenni's Trading Agency ("Client"), dated \_\_\_\_\_ ("Grant Agreement"). The Client has selected \_\_\_\_\_ ("Contractor") to perform the feasibility study ("Study") for the Concentrated Solar Power Plant project ("Project") in Lebanon ("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 J. 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. 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 so 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 which 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.

#### **H. 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 an approved Final Report in accordance with the specifications and quantities set forth in Clause I 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.

**I. 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 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. 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.

### **(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, 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.

## **J. 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.

## **K. Study Schedule**

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

The completion date for the Study, which is May 25, 2012, 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.

## **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 10/11 1001  
Activity No.: 2010-21035A  
Reservation No.: 2010210034  
Grant No.: GH 2010210015

## **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.

# ANNEX 5

## Annex I

### Terms of Reference

The objective of the FS is to assess CSP technology and analyze the construction of a 50 MW CSP power plant in the Byblos area or any other Lebanese industrial region. It is expected that the Project would generate electricity to sell it directly to industrial estates in the vicinity of the site. The FS shall include an analysis determining the best CSP technology to use; a techno-economic assessment; engineering, procurement and construction cost estimates; and a project implementation plan for a 50 MW CSP power plant.

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

The Contractor shall travel to Beirut, Lebanon to meet with the Grantee to discuss the 50 MW Concentrated Solar Power (CSP) project and its objectives. The Contractor shall develop a clear and comprehensive understanding of the planned governmental activities and national strategy related to solar and renewable energy projects in Lebanon.

The Contractor shall also meet with other relevant stakeholders in Lebanon. This shall include but is not limited to:

- Ministry of Water and Energy (MoWE),
- Electricite Du Liban,
- Ministry of Environment,
- Relevant Chambers of Industry and large scale industries,
- United Nations Development Program (UNDP) energy program at the Ministry of Water and Energy, and
- Other stakeholders suggested by the Grantee.

During the meetings in Lebanon, the Contractor shall gather and review relevant studies and data provided by MoWE and other relevant Ministries, the World Bank, USAID projects, and other donor-funded project reports on solar and renewable energy projects in Lebanon such as the UN Economic and Social Commission for Western Asia.

The Grantee shall make available to the Contractor available details regarding their previous efforts (i.e., the Grantee's ongoing efforts for a 2.5 MW CSP, and other relevant research and studies the Grantee has undertaken) in the solar energy sector in Lebanon and other details required to analyze the development of the sector in Lebanon.

Furthermore, the Contractor shall identify additional information from the Grantee and other relevant entities to complete the Study. The Contractor shall prepare an excel spreadsheet outlining the additional information required.

**Deliverable:** The Contractor shall provide a report on the findings of the initial meetings, documentation of all gathered information and previous studies, and a detailed work plan.

## **Task 2: CSP Technology Screening and Evaluation**

The Contractor shall describe the status of CSP technology applications and developments and solar thermal power technologies that may be pertinent to Lebanon. The Contractor shall provide a brief description of each technology, including a summary of technology characteristics, and any 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 Contractor shall conduct a technology screening exercise that includes a comparative analyses of CSP solar technologies (e.g., concentrated solar thermal (CST), concentrated photovoltaics (CPV), concentrating photovoltaics and thermal, and others) versus those of the various other commercially available solar technologies as it relates to Lebanon's conditions. The Contractor shall prepare a detailed description of each type of technology as well as a comparative assessment of each technology against a set of criteria that pertains to Lebanon and the proposed project location, such as altitude, sun related data, infrastructure requirements, resources requirements (e.g., water, labor, etc.). The purpose of these analyses is to determine the suitability of CSP technology for solar power generation given the local conditions. The Contractor shall review 5 to 7 available technologies of the purposes of this task.

For the each of the CSP technologies/options, the Contractor shall conduct the following:

- a) Undertake a detailed techno-economic review of the various CSP technologies;
- b) Develop and document the methodology for technologies' performance measurement and technology performance evaluation. For each screened technology, the Contractor shall describe the technical means with which the performance of such technology is evaluated in order to continuously monitor and evaluate its productivity, efficiency, etc.;
- c) Review and identify any relevant Intellectual Property Rights (IPR) and technology concepts;
- d) Perform systems' integrity reviews (equipment operations, control and maintenance issues) based on a review of components and equipment, quality assurance and reliability information, as well as any operating experience various CSP manufacturers have to date. The Contractor shall utilize an extensive literature review of published information on different technology applications, in addition to information that manufacturers are willing to provide to the Contractor;

- e) Compare the energy conversion efficiency factors for the various technologies based on previous documented data measurements and documented case studies and experiments;
- f) Extrapolate solar efficiency and field performance provided by various CSP manufacturers based on actual plants that would resemble the proposed site in Lebanon;
- g) Review and comment on the proposed technology licensing agreements that would have to be negotiated between manufacturers and the Grantee, if any;
- h) Identify technology and operations risk areas and mitigation as it relates to project yield, as well as capital and operating expenses;
- i) Provide details and literature on actually operating solar power plants that utilize CSP technologies under overall conditions that are similar to Lebanon's; and
- j) Explore the available storage technologies and examine its feasibility to overcome energy intermittency to grid connectivity.

The Contractor shall examine the various solar CSP electricity generation technologies, undertake analysis of those that could reasonably be considered suitable for commercial power generation in the study area, and identify a preferred technology for further evaluation in this feasibility study. In addition to the factors above, the Contractor shall identify the most appropriate technology that takes into consideration the status of the technology and commercial experience, the solar resource in the study area, costs, and any associated risks. The Contractor shall also consider additional criteria in the comparative analyses such as average unit plant capital cost, average unit operation and maintenance costs, average unit levelized electricity, average unit land requirements, and annual capacity factors.

**Deliverable:** The Contractor shall prepare a report detailing the findings of the work performed under this Task 2. The Contractor shall prepare a detailed justification of why the selected technology is best suited for the proposed project in Lebanon.

### **Task 3: Electricity Demand Market and Utility Connection Requirements**

To determine the optimal phasing for implementing the proposed Project up to its full capacity, the Contractor shall conduct a detailed analysis of electricity consumption histories of the industries housed in the vicinity of the proposed site. These industries would potentially constitute future buyers of electricity from the proposed Project. With assistance from the Grantee, the Contractor shall also obtain consumption data from the electricity concessionaire the Byblos region or any other Lebanese industrial region.

The Contractor shall determine the trends in demand growth for the industrial users, and the growth trends in the available sources for meeting those demands (including own generation, national grid, etc.).

The Contractor shall also collect and document technical information on the network needs in the area that would be utilized to transmit electricity from the proposed Project to the potential buyers of electricity in the area. This shall include the transmission and distribution network, substations, and any relevant infrastructure in the area of the project.

Based on the above analysis and the demand projections for the proposed area that could be fully/partially met through the proposed Project, the Contractor shall determine the phasing for implementing the Project up to its full generation capacity and further future expansions.

Finally, the Contractor shall study in detail the various technical, financial, and legislative requirements for connecting the proposed Project to a local grid that would supply the buyers in the study area.

**Deliverable:** The Contractor shall prepare a report on the work performed in this Task 3. The report shall detail all assumptions made for the various scenarios related to electricity consumption generation, and demand projections.

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

Although the Grantee has identified a proposed location for the Project, the Contractor shall conduct an assessment of the proposed area in order to determine its adequacy for the proposed Project. The Contractor shall determine any improvements needed for the infrastructure requirements and servicing, site preparation, local utility grid connection and capacity. The Contractor shall conduct a site assessment that clearly identifies site advantages and how those could be capitalized on, as well as site deficiencies with proposed measures to overcome them. The Contractor shall also assess two other sites within the proposed vicinity. The approach for the site assessment shall cover a number of issues including, but not limited to, the following:

- Size sufficiency for possible development of a solar power plant;
- Clearance and shading from vegetation, structures, hills, or other factors;
- Orientation and topography (gradient);
- Availability and/or suitability for access roads to all parts of the site;
- Proximity to high voltage transmission network;
- Access to water supply and waste water disposal for operation and maintenance and other services;
- Appropriate separation from domestic residences and noise and visual impact-sensitive areas;
- Proximity to sources of dust which could obscure sunlight and coat panel surfaces with a film that would reduce plant efficiency;
- Appropriate zoning and environmental considerations;

- Connection points as part of the selection process; and
- Substation location and inverters positioning within the plant.

Furthermore, the Contractor shall work with the relevant Ministries to obtain data from the nearest weather station. The Contractor shall analyze this meteorological data as well as other insulation data. The Grantee shall work with the Contractor to ensure they have access to the pertinent data and information.

Finally, the Contractor shall prepare a summary description of the required licensing and permitting procedures including water supply and wastewater discharge, electricity and power, substation connection requirements, environmental licensing, and construction and registration permits.

**Deliverable:** The Contractor shall prepare a detailed report on the findings of the site assessment.

### **Task 5: Facility and Equipment Requirements**

Based on the estimate for demand and the technology screening results, the Contractor shall prepare a conceptual design and preliminary technical specifications for the proposed facility's requirements. This shall include the following:

- Design basis and philosophy
- Process and technology/equipment description and options
- Mass and system utility balance
- System performance and specification
- Key equipment sizing and specification (for local conditions)
- Technical and conceptual design drawings and supporting calculations for the selected technology to include the following:
  1. Field piping optimization
  2. Electrical distribution optimization
  3. Plant reliability
  4. Variable speed drives
  5. Cooling system study (wet vs. dry vs. hybrid cooling)
  6. Cooling tower location
  7. Compressed air system
  8. Modularization and containerization
  9. Heliostat field ground preparation
  10. Wastewater treatment
- The conceptual design includes:

1. General arrangements
2. Building drawings
3. Piping and instrumentation diagram
4. Process flow diagram
5. Material and energy balance
6. Major equipment list with sizing
7. Major equipment specifications
8. One-line diagrams
9. Control system single line diagrams
10. Instrument Index

**Deliverable:** The Contractor shall prepare a detailed report on the work performed under this Task 5. The Contractor shall include all design reports and calculations, as well as the conceptual drawings developed under this task.

#### **Task 6: Financial and Technical Analysis**

The Contractor shall conduct a financial and technical analysis for the proposed project.

The Contractor shall do the following:

- i. Define all technical characteristics for the proposed solar energy plant layout including capacity, conceptual design, power generation water and other resources requirements, equipment requirements, and supplies required for the maintenance and operation of proposed plant. The Contractor shall include the full costs of all required infrastructure and equipment, construction, utilities, costs of operations, as well as predicted sales of electricity and improved electricity availability for various activities in the area such as industry, recreation, and tourism;
- ii. 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;
- iii. 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 less those geared towards the environmental fund of Lebanon. Furthermore, the Contractor

- shall conduct an assessment of the carbon emissions produced using conventional power generation scheme prevalent in Lebanon for the same power generation capacity. The Contractor shall take this into account in the financial analysis in terms of carbon credit trade off's and other incentives;
- iv. Assess and prepare financial projections for the Project over 20 years of operation including balance sheet, income statement, and cash flow statement in nominal terms covering a period of 20 years. The Contractor shall explain in detail the assumptions made in the financial statements. Financial projections shall take into consideration the likely effects of inflation, the potential for exchange rate fluctuations and the reduced efficiency of the plant with time;
  - v. Carry out a financial evaluation for the 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 shall be computed using constant 2010 prices. The cost estimates and financial projections in nominal terms shall be converted to real terms by removing the projected effects of foreign and domestic inflation and currency fluctuations. The Contractor shall derive the Incremental costs and benefits from evaluating the financial position under a with-project and without-project scenario;
  - vi. Identify risk factors (e.g. variations in sunshine days and daylight durations) and test the sensitivity of the project to them, and propose mitigating measures. The Contractor shall undertake a sensitivity analysis by varying charges, costs, implementation delay, and combination of these factors. The Contractor shall also calculate the switching values for these factors, excluding implementation delay. The Contractor shall review the sensitivity of the financial viability of the project to future exchange rate movements; and
  - vii. Undertake a financial management requirements assessment of the Grantee which shall include (a) corporate planning and budgetary control, (b) financial and management accounting, and (c) internal control and audit system.

**Deliverable:** The Contractor shall prepare a report describing all the work performed under this Task 6, including the technical analysis and 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 time table, cash flow and Project execution plan for the various stages, milestones and activities of the Project. This plan will use the conceptual design developed in Task 5 as a basis. The Contractor shall prepare a comprehensive list and develop an estimate of potential procurement of U.S. equipment and technology, engineering procurement and construction (EPC) contractors, as well as their level of interest in the Project.

Additionally, the Contractor shall help Grantee identify likely sources of financing. Grantee shall discuss each option with representatives of the World Bank, Islamic Development Bank, USAID, International Finance Corporation, 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 Lebanese energy sectors. The Contractor shall be available to participate in such meetings in the United States, or through telephone calls, with the Grantee.

The implementation strategy is expected to serve as a key component of the business plan (that will be developed by Grantee), and would serve as a business model for future similar projects in Lebanon and the region. The Contractor shall finalize the implementation plan with the Grantee.

**Deliverable:** The Contractor shall prepare a detailed implementation plan and time table for the 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 explore and study the various options such as private investment/ownership, public-private partnerships, lease-purchase, and others.

The Contractor shall prepare an analysis of the legal framework required to ensure the compliance of the proposed institutional arrangement within existing legislations. The Contractor shall also address the institutional capacities of the various entities to determine any capacity building needs.

**Deliverable:** The Contractor shall prepare a detailed report on the institutional arrangements including recommendations of the proposed management/ownership structure.

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

The Contractor shall review and analyze all regulatory issues that could impact the viability of the project. This shall include the national mandates related to renewable energy in general, and solar energy in particular. The Contractor shall also review Law 462 and clearly describe any appropriate regulations or implementation incentives that may be necessary to supplement such law.

The Contractor shall also discuss the following issues:

- a. Legal environment and applicable laws and regulations and implications on the project, including the potential risks;
- b. Incorporation and shareholding agreements;
- c. Prospectus development;
- d. Power Purchase Agreements with guarantees for potential buyers (i.e., the industrial estate in the proposed Project area or the electricity concessionaire in the Byblos region);
- e. Technology performance guarantees agreements;
- f. Land lease agreement with the private owner of the property; and
- g. Loan agreement.

**Deliverable:** The Contractor shall prepare a detailed report with the findings of the legal and regulatory review.

#### **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, ((b) soil erosion (c) local community disturbances from construction activities, and (d) possible changes in land use. The Contractor shall outline appropriate mitigation measures, management procedures and monitoring programs, if any. The Contractor shall also conduct a preliminary social impact assessment of the project. The Contractor shall consider the following:

- Area required for the solar panels and the consequent impacts on visual amenity and local flora and fauna; and
- Reflections from the solar panels field.

**Deliverable:** The Contractor shall prepare a report describing the preliminary environmental and social analysis. The Contractor shall also include the environmental and social issues that may require further analysis and/or mitigation.

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

The Contractor shall prepare a developmental impact analysis to provide the Project's decision-makers and interested parties with a broader view of the Project's potential effects on the host country. While specific focus shall be paid to the immediate impact of the Project, the Contractor shall also analyze 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 describe the infrastructure built as a result of Project implementation. The Contractor shall also analyze the impact that the infrastructure changes will have both on Lebanon 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 need to receive training; and shall provide a description of such additional training programs. The Contractor shall include an assessment of the multiplier effect on job creation in the energy, water, agricultural, and other sectors.

Technology Transfer and Productivity Enhancement Opportunities - The Contractor shall identify efficiency gains as a result of the Project as well as describe the transfer of technology to Lebanon.

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:** The Contractor shall prepare a report describing the developmental impact of the Project.

**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 I of Annex II of the Grant Agreement. The Contractor will provide both the Grantee with 6 copies of the final report on CD-ROM in *English*.

**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 an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**



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.

2. 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 \_\_\_\_\_. The Offeror commits to notify USTDA and the Grantee if they become aware of any change in their status in the state in which they are incorporated. USTDA retains the right to request an updated certificate of good standing.
3. 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.
4. 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 3 above.
5. 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.
6. 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.

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

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

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

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

**E. Subcontractor Profile**

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).

**F. Subcontractor's Representations**

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

1. Subcontractor 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 subcontractor has all the requisite corporate power and authority to conduct its business as presently conducted, to participate in this proposal, and if the Offeror is selected, to execute and deliver a subcontract to the Offeror for the performance of the Feasibility Study and to perform the Feasibility Study. The subcontractor 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.
  
2. Neither the subcontractor 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 subcontractor, 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 subcontractor. The subcontractor, 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 subcontractor 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 subcontractor has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected subcontractor shall notify the Offeror, Grantee and USTDA if any of the representations included in this proposal are no longer true and correct at the time of the Offeror's entry into a contract with the Grantee.

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

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

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

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