

REQUEST FOR PROPOSALS

FEASIBILITY STUDY FOR THE

**BIOMASS POWER PLANT AND WASTE HEAT RECOVERY FOR CEMENT
PRODUCER**

Submission Deadline: 5:00 PM

Local Time – Lahore, Pakistan

January 7, 2013

Submission Place: Syed Mazher Iqbal
Managing Director and CEO
Pioneer Cement Limited
135-Ferozpur Road
Lahore, Pakistan
Tel: +92 42 37503570 – 72

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.

REQUEST FOR PROPOSALS

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Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US\$769,000 to Pioneer Cement Limited (PCL) (the “Grantee”) in accordance with a grant agreement dated September 19, 2012 (the “Grant Agreement”). The grant provided to PCL will fund a Feasibility Study (the “Activity”) on the technical and economic viability of incorporating a 35-50 MW biomass-fired power plant, a 5-7 MW waste heat recovery (WHR) unit, and energy efficiency upgrades to mitigate or reduce dependence on unreliable grid power at a major private sector cement plant (the “Project”) in Pakistan (the “Host Country”). The Grant Agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to perform the Feasibility Study.

1.1 BACKGROUND SUMMARY

The Grantee is a publicly traded Pakistani cement and concrete producer and owns the cement plant located at Chenki in District Khushshab, Punjab Province, which is the focus of this Feasibility Study. The plant is equipped with two cement production lines with total production capacity of 6,200 tons clinker per day. The Grantee’s production costs are rising, particularly in terms of fuel and power. As a result, the Grantee is intent on maximizing production capacity utilization, maintaining quality, and reducing its cost of production.

This Feasibility Study will assist the Grantee with its energy efficiency goals by determining the viability of incorporating the above-referenced biomass-fired power plant, WHR unit, and energy efficiency upgrades at the cement plant. The Grantee is planning to implement the biomass-fired power plant to meet the cement plant’s internal demand, with any surplus energy being sold to the National Transmission & Despatch Company (NTDC). The preferred fuel is agricultural waste residues such as rice husks and wheat straw. As stated above, the Feasibility Study will also analyze the installation of a WHR unit to further reduce the Grantee’s cost of production by capturing the waste heat from the pre-heater and the grate cooler area of its larger kiln. In addition, the Grantee plans to replace old equipment that has reached its useful life or become inefficient with energy efficient equipment. These systems may include compressors, grinding mills, cement mills, pumps, dust collection motors, and filter fans.

Portions of a background Definitional Mission are provided for reference in Annex 2.

1.2 OBJECTIVE

The Feasibility Study (FS) will entail a detailed technical evaluation of the requirements for the implementation of a stand-alone 35-50 MW biomass combustion plant and a 5-7 MW WHR unit, as well as the installation of energy efficient equipment. The Contractor will conduct an energy audit as part of the Activity to determine replacement costs and the availability of energy efficient motors. The Activity will also examine any environmental issues and social/developmental impacts associated with the Project; conduct a financial analysis of the Project; analyze specific policies and regulations pertinent to the Project; prepare an implementation plan for the Grantee; and develop tender documents for the Grantee’s use during

the procurement process. 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\$769,000. **The USTDA grant of \$US769,000 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\$769,000 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 Biomass Power Plant and Waste Heat Recovery for Cement Producer.

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 for Pakistan to address technical, financial, sociopolitical, environmental and other aspects of the Project. Portions of the DM report are 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\$769,000.

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:

Syed Mazher Iqbal
Managing Director and CEO
Pioneer Cement Limited
135-Ferozpur Road
Lahore, Pakistan

Phone: (92-042) 37503570-72

Fax: (92-042) 37503573-74

An Original and six (6) copies of your proposal must be received at the above address no later than 5 pm on January 7, 2013.

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 the name of the project and designation of "original" or "copy number x." The original and six (6) copies should be collectively wrapped and sealed, and clearly labeled, including the contact name and the name of the project.

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

2.15 OFFEROR'S AUTHORIZED NEGOTIATOR

The Offeror must provide the 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.

2.16 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.

2.17 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.

2.18 EXCEPTIONS

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

2.19 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.

2.20 RIGHT TO REJECT PROPOSALS

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

2.21 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.

2.22 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.

2.23 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.

2.24 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\$769,000, which is a fixed amount.

Offerors shall submit one (1) original and six (6) 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,
- Firm Background Information,
- Completed U.S. Firm Information Form,
- 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 U.S. FIRM INFORMATION

A U.S. Firm Information Form in .pdf fillable format is attached at the end of this RFP in Annex 6. The Offeror must complete the U.S. Firm Information Form and include the completed U.S. Firm Information Form with its proposal.

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 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. Experience in preparation of similar biomass-fired power plant bankable feasibility studies (35 points).
2. Experience working with energy efficiency audits and waste heat recovery units for cement plants (20 points).
3. Experience working with electrical regulatory authorities and the cement industry in developing countries (20 points)
4. Experience working in the region, specifically in South Asia (15 points)
5. Experience working in Pakistan (10 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

FEDBIZOPPS ANNOUNCEMENT

Proposal Submission Place:

Syed Mazher Iqbal
Managing Director and CEO
Pioneer Cement Limited
135-Ferozpur Road
Lahore, Pakistan

Phone: (92 42) 37503570-72

Solicitation Number: 2012-31033A

Project Title: Biomass Power Plant and Waste Heat Recovery for Cement Producer

POC: Anthony O'Tapi, USTDA
1000 Wilson Boulevard, Suite 1600
Arlington, VA 22209-3901
Tel: (703) 875-4357
Fax: (703) 875-4009

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 to assess the technical and economic viability of incorporating a 35-50 MW biomass-fired power plant, a 5-7 MW waste heat recovery (WHR) unit, and energy efficiency upgrades to mitigate or reduce dependence on unreliable grid power at a major private sector cement plant in Pakistan.

Pioneer Cement Limited (PCL) (the "Grantee") is a publicly traded Pakistani cement and concrete producer and owns the cement plant located at Chenki in District Khusshab, Punjab Province, which is the focus of this feasibility study. The plant is equipped with two cement production lines with a total production capacity of 6,200 tons clinker per day. PCL's production costs are rising, particularly in terms of fuel and power. As a result, PCL is intent on maximizing production capacity utilization, maintaining quality, and reducing its cost of production.

The selected Contractor will conduct a feasibility study to determine the viability of incorporating the above-referenced biomass-fired power plant, WHR unit, and energy efficiency upgrades in order to assist the Grantee with its energy efficiency goals. The Grantee is planning to implement the biomass-fired power plant to meet the cement plant's internal demand, with any surplus energy being sold to the National Transmission & Despatch Company (NTDC). The preferred fuel is agricultural waste residues such as rice husks and wheat straw. The feasibility study will also analyze the installation of a WHR unit to further reduce the cost of production by capturing the waste heat from the pre-heater and the grate cooler area of its larger kiln. In addition, the Grantee plans to replace old equipment that has reached its useful life or become inefficient with energy efficient equipment. These systems may include compressors, grinding mills, cement mills, pumps, dust collection motors, and filter fans. The Contractor will also conduct an energy audit as

part of this activity to determine replacement costs and the availability of energy efficient motors.

The U.S. firm selected will be paid in U.S. dollars from a \$769,000 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 portions of 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 5:00 pm on January 7 2013 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.

A N N E X 2

PORTIONS OF BACKGROUND DEFINITIONAL MISSION REPORT

SECTION IV - PIONEER CEMENT LIMITED PROJECT



A. Project Description

Pioneer Cement Limited (PCL) was incorporated in Pakistan as a public company on February 09, 1986. Its shares are quoted on all stock exchanges in Pakistan. The principal activity of the Company is manufacturing and sale of cement. The plant is located at Chenki, District Khusshab, in the heart of Punjab Province, 250 km away from Lahore and 120 km away from Motorway (M2). It is equipped with two cement production lines with total production capacity of 6,200 tons clinker per day.

Cement is one of the essential ingredients in all types of construction. Cement usage is directly related to economic activities and construction of large infrastructure projects. Ordinary Portland Cement (OPC) is one of the most commonly and widely used types of cement in the world. This type of cement is an ideal building material for almost all structural work including all kinds of concrete construction.

Sulphate Resistance Cement (SRC) is used where sulfate salts are present on the soil or in saline water. This cement has potential to resist the destructive attack of sulfates, especially in the foundations or the areas mostly subjected to sulfate attack. PCL is negotiating with neighboring countries including Afghanistan, India, Middle East and Sri Lanka for sale of cement and have required licenses to sell in these countries.

The growth in demand of cement in Asia, India and Middle East, particularly supply deficit in India and Afghanistan has geared up export opportunities for cement industry of Pakistan. Supply deficit in India has resulted in significant demand for Pakistani cement due to India's geographic proximity with Pakistan. Bureau of Indian standards have approved Pioneer Cement for import to India. This demand will also be supported by closing down of some cement units in Europe due to their strict laws governing pollution control. Being one of the big cement units of Pakistan and due to its high quality Pioneer Cement is the prime of choice of the international buyers all over the world. Pioneer Cement is committed to provide high quality cement to its international customers and is being exported to Afghanistan, India, Middle East, and Africa. Pioneer Cement meets all the international standards including American, British, Indian and European standards.

With fuel being a major component in the cement making process, the cost of production has been increasing due to unprecedented surge in furnace oil prices. The fuel firing system was converted to coal firing. Pioneer Cement was the first plant in Pakistan to convert to a coal firing system in January 2001.

Increasing operational capacity, plant efficiency, and incorporating a power plant to generate electricity for internal use are being seriously considered for implementation. A waste heat recovery system and a captive power plant to mitigate or reduce dependence on grid power are under active consideration. PCL is focused on maximizing production capacity utilization, maintaining quality and reducing the cost of production in order to satisfy stakeholder requirements.

Location of the Cement Plant is in Jauhrabad located about 4 hours drive north west of Lahore. The first line was installed in 1994 and the second in 2005. Both lines were pre-owned and at this point require replacement of existing equipment and motors with more energy efficient equipment. The plant has about 900 employees, operates in 3 shifts, and needs about 35 MW power on a continuous basis. However, power from the grid is intermittent and unreliable. PCL is seriously considering implementing a 35 MW – 50 MW biomass fired power plant to provide reliable electricity for the cement plant operation. PCL has about 315 acres land at the cement plant site. Specific project objectives are as follows:

1. Renewable energy power plant to replace power from the grid, which is becoming very expensive and unreliable due to forced shutdown and increasing shortage of electricity in the country. PCL is planning to implement a 50 MW biomass fired power plant to meet the cement plants internal demand and sell any surplus energy to NTDC which will not only generate additional revenue for the company but also help the national economy. The preferred fuel is agricultural waste residue.
2. Replace old inefficient equipment with new energy efficient equipment. Replacement could include old motors, pumps, and other electrical components.
3. PCL is equipped with two clinker production lines of 2,200 TPD & 4,000 TPD each. Installation of an approximately 7 MW waste heat recovery power plant would further reduce the cost of production by recovering the waste heat from the pre- heater and the kilns grate cooler areas of kiln # 2 the cement plant. Waste heat from kiln #1 cannot be utilized because of design limitations.

A detailed technical evaluation is required to implement a stand-alone 50 MW biomass combustion plant and a smaller ~ 5 MW - 7 MW waste heat recovered power plant. Both plants will be separate and include steam turbines.

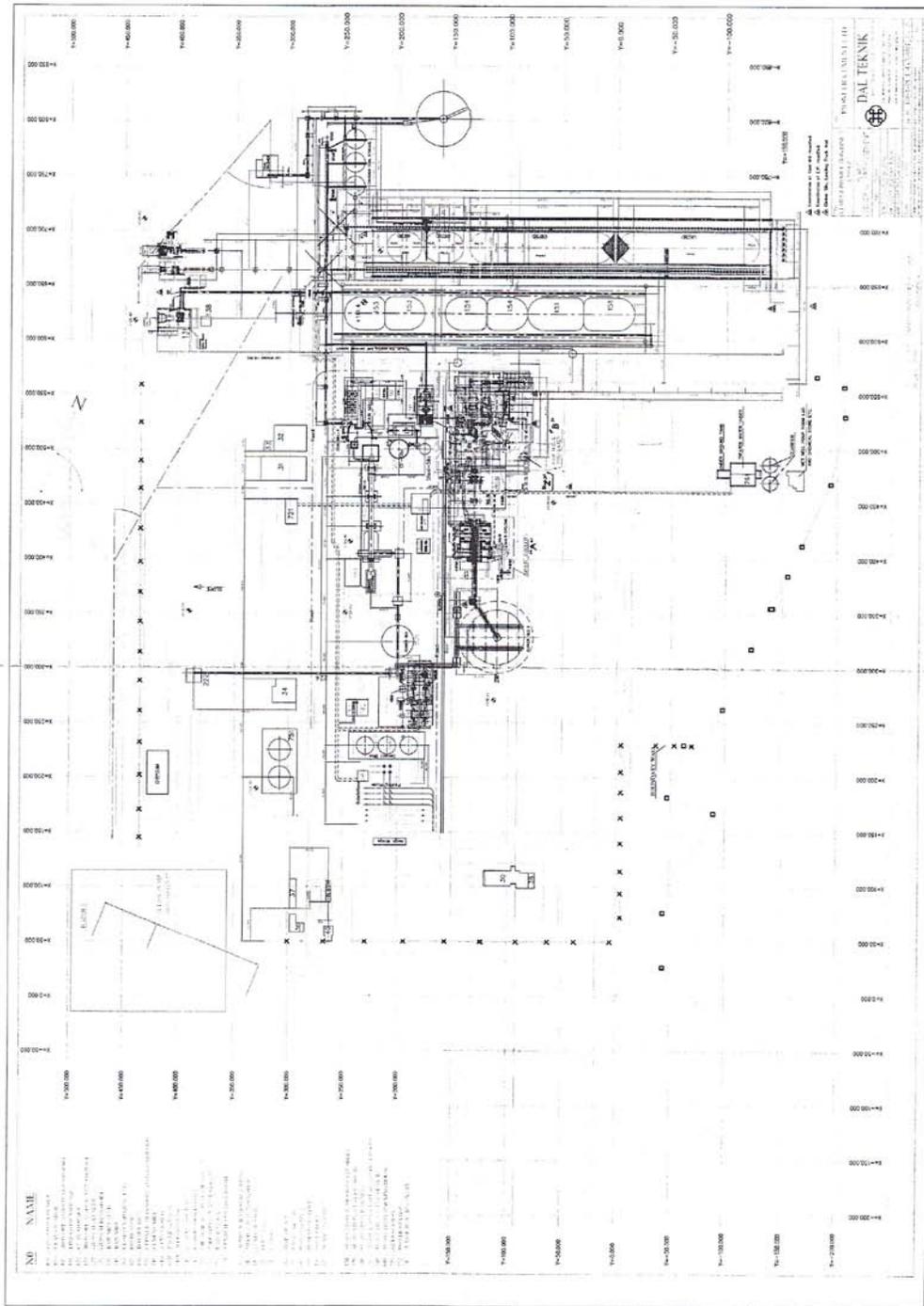
There is substantial (over 350 acres) of land, adjacent to the cement plant, owned and available by PCL. Therefore, for purposes of siting a new power plant, there is no land acquisition or availability issue.

Cement production line # 1 was manufactured by FLSmidth of Denmark. The second line's manufacturer is DAL Technik. Production line #1 has 5 preheater stages single string and line # 2 has 4 preheater stages double string. Waste heat is to be recovered only from line # 2.

Water is received from an irrigation canal located about 5 km away from the plant. Present water consumption is about 900 m³ / day. Sedimentation tanks and filtration are used to clean the water.

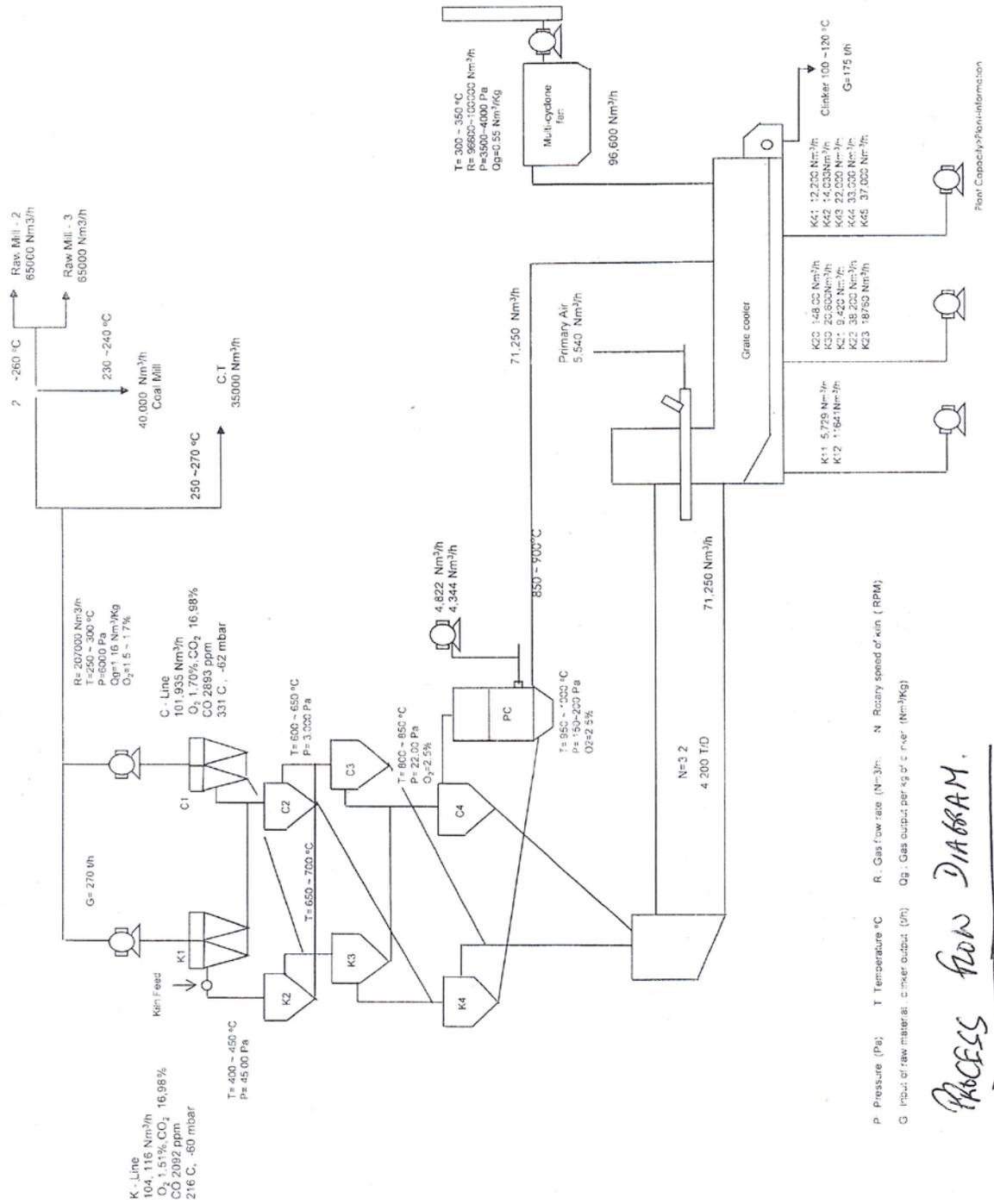
The cement plant has some fairly large HP motors driving equipment, such as, compressors, grinding mills, cement mills, pumps, dust collection motors, and filter fans. Most of these motors have reached their useful life and / or are not efficient. Therefore, an energy audit is required to determine availability of energy efficient motors and replacement costs.

The plant layout, process flow, and single line diagram are shown on the following pages.



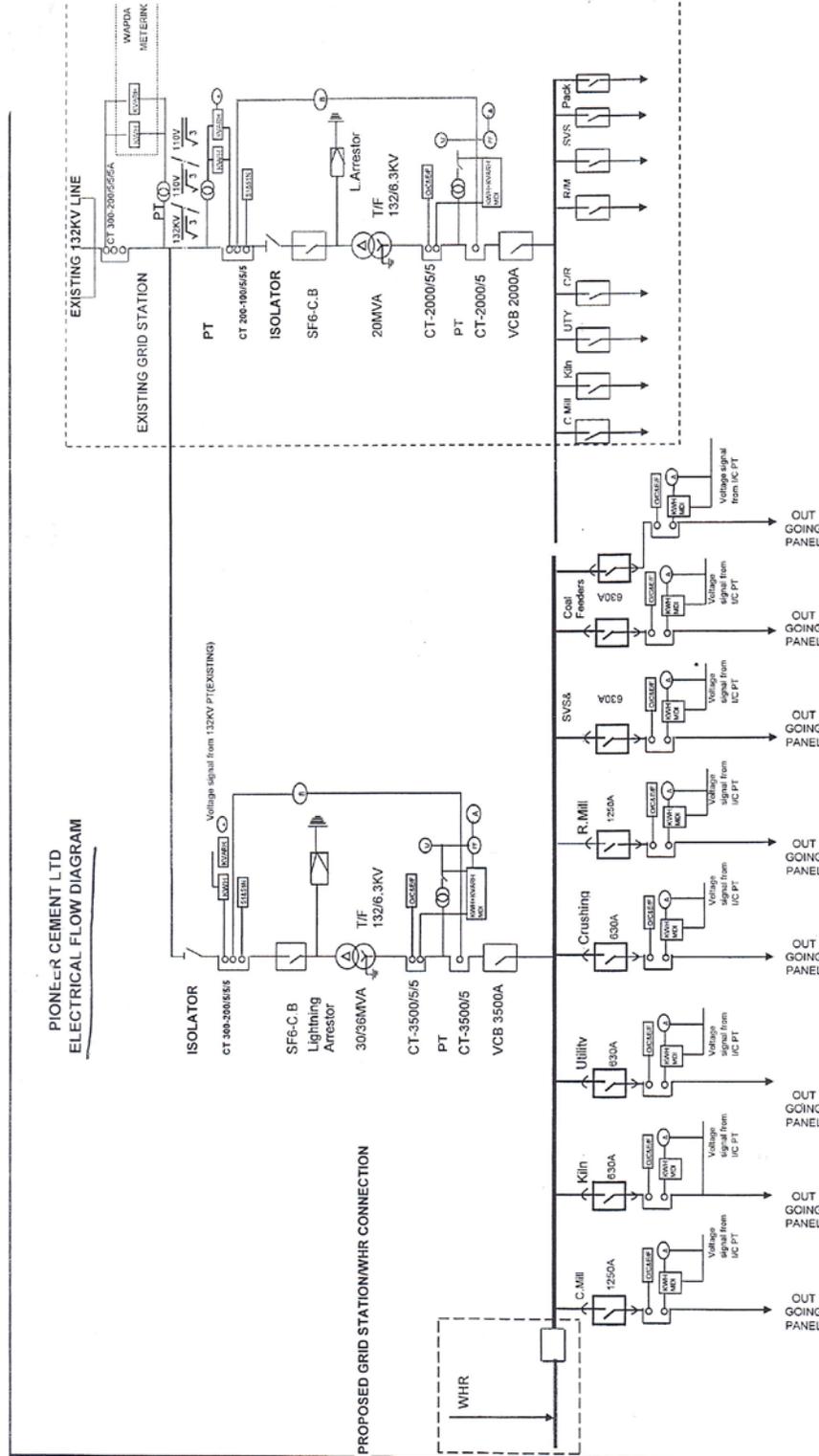
CEMENT PLANT LAYOUT

Process Flow Diagram, Portland Cement, Ltd.



Process flow DIAGRAM

PIONEER CEMENT LTD
ELECTRICAL FLOW DIAGRAM



NOTE: RED MARKING =EXISTING
BLACK MARKING =PROPOSED

LEGENDS

	Current transformer		volt Meter
	Voltage Transformer		Kilowatt hour Meter
	Circuit Breaker		P-Factor Meter
	Disconnector		Kilo var hour Meter
	Power Transformer		Over current/Earth Fault Relay
	Surge Arrester		Differential Relay
	Ammeter		Over current/Earth Fault Relay

PIONEER CEMENT LIMITED
EXISTING/PROPOSED 132KV GRID STATION

DEPTT.	ELECT. & PLANNING	PREPARED	Ghulam Ya
EOPT.	GRID STATION	CHECKED	M. Saleem
DRG. NO	1-I/E&P/001	APPROVED	M. Maqsood
DATE	26-11-2004	SCALE	GRID STAT

B. Financing Options

Total implementation costs are estimated at \$109 million. This feasibility study will include a detailed financial analysis, carbon credit analysis, and a financing plan. Financing through multilateral and/or bilateral lenders is likely given that Pakistani banks generally have a low appetite for the cement sector. Pioneer Cement has obtained financing for other projects from the Asian Development Bank (ADB) and Asian Finance and Investment Corporation (AFIC) in recent years. Potential financing or credit insurance from the U.S. Export-Import Bank will be assessed in regards to the export of U.S. goods and services.

Pioneer Cement Limited's (PCL) first cement clinker production and grinding process plant installation was financed through foreign currency loans from the Asian Development Bank (ADB) and the Asian Finance and Investment Corporation (AFIC).

Affiliate companies of PCL in Pakistan have obtained financing within the last several years from the International Finance Corporation (IFC) for over 500 MW of new power generation (approximately US\$350 million), a container terminal in Karachi (approximately US\$50 million), and an inland container depot at Lahore (approximately US\$10 million). The IFC is also considering financing for another affiliate company for the first 30-story green building in Pakistan.

PCL also routinely arranges local financing and is currently able to draw upon local bank financing (term finance, cash finance and running finance) of a combined total of the equivalent of almost US\$12 million from Meezan Bank, National Bank of Pakistan, and United Bank. Further project financing from local banks may be obtained based on the results of the feasibility study. Self-financing by PCL would be from internal cash generation along with a rights issue to existing shareholders. Other financing options that may be explored are suppliers' credit and treatment of the biomass power plant as a stand-alone venture for project financing purposes.

C. U.S. Export Potential

This project could represent a unique opportunity for U.S. developers, independent private power producers and operators, and potential investors to break into this difficult market in Pakistan. The whole biomass to energy sector is fairly new in Pakistan. Traditionally, Pakistani firms tend to prefer to buy cost-saving equipment currently being supplied by Chinese vendors.

Depending on the selected combustion technology the following U.S. firms can provide state of the art proven technology for biomass combustion systems.

Babcock and Wilcox

Power Generation Group
20 South Van Buren Ave.
Baberton, OH 44203
Phone: 1-330-860-2820

Foster Wheeler Corporation

Perryville Corporate Park
Clinton, NJ 08809-4000
Phone: 1-908-713-2500

Indeck Power, Inc.

1111 Willis Ave.

Wheeling, IL 60090

Phone: 1-985-892-4224

Factory Sales & Engineering Inc.

74378 Highway 25

Convington, LA 70435

Table 4 shows a preliminary estimate of \$83.0 million U.S. export potential.

Table 4 - U.S. Export Potential for the PCL Project

Description of Project Component or Cost Category	TDA Consultant's Cost Estimate (USD Million)	Overall U.S. Market Competitiveness	Projected Potential U.S. Exports and Fees (USD Million)
Biomass Storage, Collection, Equipment and Transportation	12.0	Fair	6.0
On –Site new buildings and other Improvements	1.0	Poor	0.0
Biomass Combustion Train including Boilers	50.0	Good	50.0
Air Pollution Control Equipment	4.0	Good	4.0
Electrical Equipment and Related System Upgrades	2.0	Fair	1.0
Mechanical Work, Water Treatment and Other Balance of Plant Items	10.0	Fair	5.0
50 MW & 7 MW Steam Turbines, Auxiliaries, and Control Systems. Includes Works for WHR Unit	25.0	Good	15.0
Engineering, Procurement, and Construction Contract	5.0	Fair	2.0
Totals	109.0		83.0

D. Foreign Competition

U.S. based companies are eager to sell equipment to Pakistani projects but most large manufacturing firms also have policies and/ or restrictions to send their personnel to Pakistan. So, in order to proceed with the work U.S. companies will generally team up with a Pakistani or a Middle Eastern engineering firm located in Dubai. Under such an agreement the Pakistani firm will be the subcontractor responsible for construction and other local activities. This does make an EPC contract more complex but it is doable.

Presently, there are no operational biomass combustion plants in the range of 50 MW in Pakistan. U.S. has several boiler/ grate manufacturing firms including Babcock & Wilcox, and Foster Wheeler that manufacture and sell such equipment. However, there is strong competition from both European and Chinese firms. Pakistan is abundant with Chinese industrial and consumer goods. Also, typically Pakistani buyers look for the best price and not quality. The Chinese companies will offer the best prices, however, we were informed that the quality of their products, including for boilers and turbines are not at par with international standards and subsequently have much shorter operational lives.

Major foreign competitor is DP Clean Tech that is based in Denmark, and now associated with a Chinese company to manufacture equipment at a lower cost. DP Clean Tech is essentially a boiler manufacturer and has a vibrating combustion grate similar to Babcock & Wilcox's vibrating grate combustion system.

E. Developmental Impact

The project's potential Development Impact on the following four areas is delineated below:

- a. Infrastructure;
- b. Human capacity building;
- c. Technology transfer and productivity improvement;
- d. Market-oriented reform.

Infrastructure

A new biomass fired power plant will require, biomass collection facilities, road improvements in rural areas, significant collection and processing equipment such as balers, compactors, front end loaders, transportation vehicles such as 40 foot flat beds. A new power plant will require a new water treatment plant, and structures to house the project that will include boilers and a steam generation unit.

Jobs and Capacity Building

During construction of the proposed project, the average on-site labor force will be around 300 workers. They will include engineers, pipe fitters, welders, boiler makers, equipment operators, electricians, electronic technicians, operators, skill craftsman and unskilled laborers. The construction will last about 24 months. It is anticipated that at least 80% of the work force during this phase will be local and the rest will be provided by different equipment suppliers (Pakistani and/or international).

The biomass collection centers will each require a site manager, a maintenance manager, an equipment manager, and at least four general laborers at each site. Therefore, a labor force of at least seven staff will be required for each site for a total of 35 new employees. In addition, the transportation activity will require vehicle drivers.

At least six months before start-up of the new project, the regular cogeneration plant employees will need to be hired and put into training. Most of the training will occur at the construction site and be specific to the job for which the individual is employed. The regular staff of the cogeneration plant will consist of a plant manager (experienced engineer in plant operations), a maintenance manager, two degreed mechanical engineers, three degreed shift engineers, ten operators.

Technology Transfer

Upon implementation, this project will be one of the few efficient biomass fired power plants in Pakistan. Once commercial success is attained, this project should lead to replication of this model in various industries in Pakistan. Forming a trained Pakistani work force and showing its ability to successfully operate this plant will further motivate other private sector and industrial clients to consider use of this technology.

Market Oriented Reform

Depending on the outcome of the FS the proposed cogeneration facility may be a privately-owned project. Excess electricity produced will be sold to the power grid via the National Transmission & Dispatch Company (NTDC). The power plant is expected to represent a step towards strengthening private sector industries in the country and opening up more competitively priced (i.e., lower cost) electricity in the region and country overall. Note that Pakistan already has a history of dealing with Independent Power Producers (IPPs) and entering into long-term power purchase agreements (PPAs) with these.

F. Impact on Environment

This project envisions an implementation of a 50 MW biomass fired power plant at the existing 6,200 tons per day cement production plant. This plant is located in a remote area near Jauhrabad. The closest habitation is the village of Chenki. Otherwise the cement plant is surrounded by limestone hills and uncultivated land. The neighboring hills are being excavated and mined for limestone. Subsequently, there is substantial ongoing industrial activity at the site.

A new 50 MW power plant will need to comply with local Pakistani Environmental Protection Agency (EPA) regulations. Environmental control regulations will require electrostatic precipitators or bag houses to capture particulates prior to emission from the stack. The ash residue collected from boiler grates will need to be stored, managed, and transported to an engineered landfill or recycled. It is not envisioned that any hazardous waste will be combusted or generated at the new power plant. Environmental controls and mitigation measures to capture and dispose of fly and bottom ash will result in negligible impact on the environment.

G. Impact on Labor

This project will be constructed and operated for a local cement production plant in Pakistan. Therefore, impact on U.S. Labor is zero and in the U.S. no jobs are impacted. However, if this project proceeds to implementation it will result in increased work for manufacturing as well as engineering staff.

H. Team Qualifications

The FS consultant must compose a team that can complete all the TOR requirements. The team is envisioned to include the following personnel:

- Senior Project Manager with at least 10 years' experience in project management, design, implementation and development of a greater than 30 MW biomass and/or coal fired power plant.
- Power Plant Engineer with at least 10 years plant design, layout, equipment specification, costing and equipment procurement experience.
- Combustion Engineer with a minimum of 10 years' experience in designing, or operating solid waste fuel combustions systems and fully familiar with various combustion technologies.
- Fuel Analyst who can review and analyze biomass fuel collection, transportation, storage, and fuel preparation for feeding in a combustion chamber.
- An Environmental Specialist with a minimum of 10 years' experience who can conduct and write a preliminary environmental assessment report.
- Project Financial Specialist with a minimum of 10 years' experience structuring financial plans, conducting life cycle costing, and sensitivity analysis.

A N N E X 3

USTDA NATIONALITY REQUIREMENTS



**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.

A N N E X 4

USTDA GRANT AGREEMENT, INCLUDING MANDATORY
CONTRACT CLAUSES

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 Pioneer Cement Limited (PCL) ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Grant Agreement US\$769,000 ("USTDA Grant") to partially fund the cost of goods and services required for a feasibility study ("Study") on the proposed Biomass Power Plant and Waste Heat Recovery for Cement Producer ("Project") in Pakistan ("Host Country").

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.

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. Therefore, USTDA, the Grantee, and the Contractor shall not directly or indirectly provide, offer or promise to provide money or anything of value to any public official in violation of any United States or Host Country laws relating to corruption or bribery.

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. Contract Matters and USTDA's Rights as Financier

(A) Grantee 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). Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

(B) USTDA's Right to Approve Contractor Selection

The Grantee shall notify USTDA at the address of record set forth in Article 16 below upon selection of the Contractor to perform the Study. USTDA then shall notify the Grantee whether or not USTDA approves the Grantee's Contractor selection. Upon USTDA approval of the Grantee's Contractor selection, the Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected. The Grantee and the Contractor then shall enter into a contract for performance of the Study.

(C) USTDA's Right to Approve Contract Between Grantee and Contractor

(1) Contract

The Grantee and the Contractor shall enter into a contract for performance of the Study. The Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 16 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract. USTDA then shall notify the Grantee and the Contractor whether or not USTDA approves the contract.

(2) Amendments and Assignments

The Grantee or the Contractor may submit any proposed amendment to the contract, including any proposed amendment to any annex thereto, or any proposed assignment of the contract, to USTDA at the address set forth in Article 16 below. USTDA then shall notify the Grantee and the Contractor whether or not USTDA approves the proposed amendment or assignment.

(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 any subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and the contract or any subcontract funded by the Grant Agreement, the Grant Agreement shall control.

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 December 31, 2013, 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, (i) 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 (ii) no USTDA funds may be disbursed more than four (4) years after the Effective Date of the Grant Agreement.

9. USTDA Mandatory Contract Clauses

All contracts funded under this Grant Agreement shall include the USTDA Mandatory Contract 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 Contract 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 this 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 this 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 professional services funded by USTDA under this Grant Agreement:

- (a) the Contractor must be a U.S. firm;
- (b) the Contractor may use U.S. subcontractors without limitation;
- (c) employees of U.S. Contractor or U.S. subcontractor firms shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the United States, except as provided pursuant to subpart (d) below;
- (d) up to twenty percent (20%) of the USTDA Grant amount may be used to pay for services performed by (i) Host Country subcontractors, and/or (ii) Host Country nationals who are employees of the Contractor;

(e) a Host Country subcontractor may only be used for specific services from the Terms of Reference identified in the subcontract;

(f) subcontractors from countries other than the United States or Host Country may not be used;

(g) 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

(h) 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 this Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country, except for taxes of a de minimis nature imposed on local lodging, food, transportation, or airport arrivals or departures. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for taxes, tariffs, duties, fees or other levies, except for taxes of a de minimis nature referenced above.

13. USTDA Project Evaluation

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, the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project. Inquiries will include, but not be limited to, whether the Final Report recommendations have been or will be used to implement the Project, anticipated Project implementation timeline, and likely source of financing. In addition, the Grantee agrees to notify USTDA any time the Grantee selects a new primary contact person for this Project during the five-year period referenced above.

14. Recordkeeping and Audit

The Grantee agrees to maintain books, records, and other documents relating to the Study and this Grant Agreement adequate to demonstrate implementation of its responsibilities under this 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.

15. Representation of Parties

For all purposes relevant to this 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 its Managing Director and CEO. The parties hereto may, by written notice, designate additional representatives for all purposes under this Grant Agreement.

16. 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 an electronic medium that produces a tangible record of the transmission, such as a facsimile or e-mail message, and will be deemed duly given or sent when delivered to such party at the following:

To: Syed Mazher Iqbal
Managing Director and CEO
Pioneer Cement Limited
135-Ferozpur Road
Lahore, Pakistan

Phone: (92-042) 37503570-72
Fax: (92-042) 37503573-74
E-Mail: mazher@pioneercement.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
E-Mail: grantnotices@ustda.gov and
South_Southeast_Asia@ustda.gov

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.: 1111/121001

Activity No.: 2012-31033A

Reservation No.: 2012302

Grant No.: GH201231302

17. 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 this Grant Agreement. USTDA may also issue implementation letters to (i) extend the estimated completion date set forth in Article 8(A) above, or (ii) change the fiscal data set forth in Article 16 above. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by this Grant Agreement.

18. Grant Agreement Amendments

Either party may submit to the other party at any time a proposed amendment to the Grant Agreement. A Grant Agreement amendment shall be effective only if it has been signed by both parties.

19. Termination Clause

Either party may terminate this Grant Agreement by giving the other party written notice thereof. 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 that may be made pursuant to Clause I of the USTDA Mandatory Contract Clauses set forth in Annex II to this Grant Agreement. This article and Articles 5, 12, 13, 14, and 21 of the Grant Agreement shall survive termination of the Grant Agreement.

20. 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.

21. U.S. Technology and Equipment

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

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IN WITNESS WHEREOF, the Government of the United States of America and Pioneer Cement Limited, each acting through its duly authorized representative, have caused this Grant 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

By: [Signature]

Date: 09/21/12

Witnessed:

By: [Signature]

For Pioneer Cement Limited

V. M. Iqbal 19/19



By: SYED MALHER IQBAL

Date: _____

Witnessed:

By: WAQAR NAEEM

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

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 Pioneer Cement Limited ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the Biomass Power Plant and Waste Heat Recovery for Cement Producer project ("Project") in Pakistan ("Host Country"). The Client and the Contractor are the parties to this Contract, and they hereinafter are referred to collectively as the "Contract Parties." 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 the Contract or any subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

This Contract, and any amendment thereto, including any amendment to any annex thereto, and any proposed assignment of this Contract, 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 conforms to modifications required by USTDA during the Contract review process and the Contract has been formally approved by USTDA. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor an English language version of a final negotiated draft Contract or a signed Contract to the attention of the General Counsel's office at USTDA's address listed in Clause N below.

(2) USTDA Not a Party to the Contract

It is understood by the Contract 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 Contract 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 Contract 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 Contract Parties or the parties to any subcontract, jointly or separately; and in consideration of USTDA's role as financier, the Contract Parties further agree that USTDA's rights may be exercised without thereby incurring any responsibility or liability, in contract, tort, or otherwise, to the Contract Parties or the parties to any subcontract. 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 professional services funded by USTDA under the Grant Agreement:

- (a) the Contractor must be a U.S. firm;
- (b) the Contractor may use U.S. subcontractors without limitation;
- (c) employees of U.S. Contractor or U.S. subcontractor firms shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the United States, except as provided pursuant to subpart (d) below;
- (d) up to twenty percent (20%) of the USTDA Grant amount may be used to pay for services performed by (i) Host Country subcontractors, and/or (ii) Host Country nationals who are employees of the Contractor;
- (e) a Host Country subcontractor may only be used for specific services from the Terms of Reference identified in the subcontract;
- (f) subcontractors from countries other than the United States or Host Country may not be used;
- (g) 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
- (h) 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 period of performance of work provided for by this Contract, 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, fax number, and e-mail address. 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.

(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 approval by USTDA of a Final Report that has been (i) prepared and submitted in accordance with the requirements set forth in Clause I below, and (ii) approved in writing by the Client in the manner provided for by Clause H(3)(b)(iii) 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 Contract Clauses 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 Contract Clauses 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 Contract Clauses 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 to the attention of the Finance Department at USTDA's address listed in Clause N below, or by e-mail to invoices@ustda.gov.

I. Termination

(1) Method of Termination

Either Contract Party may terminate this Contract upon giving written notice to the other party and USTDA. This notice shall be effective after either 30 days, or any other period set forth elsewhere in this Contract. Furthermore, this Contract shall terminate immediately upon notification of USTDA's termination of the Grant Agreement or the term of availability of any funds thereunder.

(2) Ramifications of Termination

In the event that this Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for payment for the value of the work performed pursuant to the terms of this Contract. 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 value of the work performed pursuant to the terms of this Contract.

(3) Survivability

Clauses B, D, G, H, and O of the USTDA Mandatory Contract Clauses shall survive the termination of this Contract.

J. 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 hard copy 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) hard 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) hard copy of the Public Version of the Final Report to the Commercial or 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, and USTDA's address. 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 address, 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, and e-mail address 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, and e-mail address 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.

(g) The Client, USTDA, and the Commercial and/or Economic Section(s) of the U.S. Embassy in Host Country shall have irrevocable, worldwide, royalty-free, non-exclusive rights to use and distribute the Final Report.

K. Modifications

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

L. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is December 31, 2013, is the date by which the Contract 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) no USTDA funds may be disbursed more than four (4) years after the Effective Date of the Grant Agreement.

M. Business Practices

The Contract Parties recognize the existence of standards of conduct for public officials and commercial entities in their respective countries. Therefore, the Contract Parties shall fully comply with all United States and Host Country laws relating to corruption or bribery. For example, the Contractor and its subcontractors shall fully comply with the requirements of the Foreign Corrupt Practices Act, as amended (15 U.S.C. §§ 78dd-1 et seq.). Each Contract Party agrees that it shall require that any agent or representative hired to represent it in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of that Contract Party, including, but not limited to, those laws and obligations referenced above.

N. 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.: 1111/121001

Activity No.: 2012-31033A

Reservation No.: 2012302

Grant No.: GH201231302

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, except for taxes of a de minimis nature imposed on local lodging, food, transportation, or airport arrivals or departures. Neither the Client nor the Contractor will seek reimbursement from USTDA for taxes, tariffs, duties, fees or other levies, except for taxes of a de minimis nature referenced above.

P. Export Licensing

The Contractor and all subcontractors are responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.

Q. Contact Persons

The Client designates the following person as the contact person for matters concerning this Contract:

Name: Syed Mazher Iqbal
Title: Managing Director and CEO
Phone: (92-042) 37503570-72
Fax: (92-042) 37503573-74
E-Mail: mazher@pioneercement.com

The Contractor designates the following person as the contact person for matters concerning this Contract:

Name:
Title:
Phone:
Fax:
E-Mail:

If anyone designated by a Contract Party as a contact person ceases service as a contact person at any point during the ten-year period following the date of signing of this Contract, the Contract Party that had designated that contact person shall provide USTDA and the other Contract Party with the name and contact information of a replacement contact person.

R. Liability

This Contract may include a clause that limits the liability of the Contract Parties, provided that such a clause does not (i) disclaim liability for special, incidental, general, or punitive damages, or (ii) limit the total amount of damages recoverable to an amount less than the total amount disbursed to the Contractor pursuant to this Contract.

S. Arbitration

If the Contract Parties submit any dispute arising under this Contract for arbitration, the scope of any such arbitration shall be limited to the Contract Parties' rights and/or obligations under this Contract and may not extend to any right or obligation of USTDA. The arbitrator(s) shall not arbitrate issues directly affecting the rights or obligations of USTDA.

A N N E X 5

TERMS OF REFERENCE (FROM USTDA GRANT AGREEMENT)

Annex I

Terms of Reference

Purpose and Background

The purpose of this feasibility study is to assess the technical and economic viability of incorporating a 35-50 MW biomass-fired power plant, a 5-7 MW waste heat recovery (WHR) unit, and energy efficiency upgrades to mitigate or reduce dependence on unreliable grid power at Pioneer Cement Limited's (the Grantee) cement plant in Pakistan. The plant is located at Chenki, District Khusshab, in the heart of Punjab Province, 250 kilometers from Lahore and 120 km from the M2 motorway. It is equipped with two cement production lines with total production capacity of 6,200 tons clinker per day. The Grantee's production costs are rising, particularly in terms of fuel and power. As a result, the Grantee is intent on maximizing production capacity utilization, maintaining quality, and reducing its cost of production.

The Grantee is planning to implement the above-referenced biomass-fired power plant to meet the cement plant's internal demand; any surplus energy would be sold to the National Transmission & Despatch Company (NTDC). The preferred fuel is agricultural waste residues such as rice husks and wheat straw. This feasibility study will also analyze the installation of a WHR unit to further reduce the cost of production by capturing the waste heat from the pre-heater and the grate cooler area of its larger kiln. In addition, the Grantee plans to replace old equipment that has reached its useful life or become inefficient with energy efficient equipment. These systems may include compressors, grinding mills, cement mills, pumps, dust collection motors, and filter fans. An energy audit is therefore included as part of this activity to determine replacement costs and the availability of energy efficient motors. The following describes in detail the specific tasks to be undertaken by the Contractor.

Task 1: Inception Meeting and Report

The Contractor shall meet with the Grantee to discuss methodologies for the Study, establish working and reporting relationships, visit the site, obtain copies of available information, and arrange for field data collection as needed.

Deliverable: Following the above-referenced meeting, the Contractor shall prepare an Inception Report for the Study, documenting attendance at the meeting, topics discussed, future action plans, and other information gained from discussions.

Task 2: Review Existing Technical Conditions and Operations of the Plant

The Contractor shall conduct a detailed technical evaluation that is required to implement a stand-alone 35-50 MW biomass combustion plant and a 5-7 MW WHR unit. The biomass power plant and the WHR unit would be separate and both would require steam

turbines. The total area of the Grantee's cement plant is 315 acres, of which more than 150 acres is available to establish the proposed biomass power plant.

The Grantee's cement production line No. 1 was manufactured by FLSmidth. The second cement production line's manufacturer is DAL Technik. Production line No. 1 has five pre-heater stages (single string) and line No. 2 has four pre-heater stages (double string). Waste heat is to be recovered only from line No. 2.

Water is received from an irrigation canal located about five km away from the plant. Present water consumption is about 900 m³ per day. Sedimentation tanks and filtration are used to clean the water.

As part of the technical assessment, the Contractor shall complete the following activities after visiting the plant site:

- Collect data for two production lines.
- Collect plant layout schematics.
- Collect plant data & performance review for the years 2011 and 2012.
- Determine raw material reserves and pre-blending stock yard capacities.
- Determine kiln fuel types and sources.
- Identify energy inefficient equipment that needs replacement.
- Conduct an energy audit of existing operations.
- Prepare detailed technical review of existing plant power distribution system.

All of the above activities shall be documented in writing and later included in the Final Report (Task 14).

Task 3: Incorporation of a Waste Heat Recovery Unit

The Grantee is planning to incorporate a WHR unit at its cement production facility. Waste heat will be captured from two areas: the pre-heater and the grate cooler from production line No. 2. The Contractor shall review, analyze, and advise the Grantee on the preferred technology and equipment and complete the following activities:

- Assess feasibility of incorporation of a WHR unit based on heat captured from production line No. 2.
- Calculate waste heat generated and WHR equipment size required.
- Analyze and size appropriate WHR equipment.
- Identify appropriate WHR sizing as per available operational parameters (e.g., air flow rates, temperature, and pressure)
- Conduct a site selection for placement of WHR by considering steam and power line losses, and routing of steam ducts and relevant losses.

- Provide equipment specifications for the recommended size of WHR unit, and specifications for the mechanical, electrical, and control system.
- Assess power plant connection and power export/import mechanism with the existing Grantee grid station and national NTDC power network.
- Assess water supply pumping, water treatment and recycling options.
- Prepare Project implementation timeline.

Task 4: Incorporation of a new 35-50 MW Biomass-Fired Power Generation Plant

As part of the assessment of incorporating a new 35-50 MW biomass-fired power plant, the Contractor shall complete the following activities:

- Evaluate the merits of one unit versus two units.
- Conduct a detailed long term biomass fuel supply analysis which shall include biomass generation areas, availability, and mode of collection.
- Evaluate biomass Higher Heating Values by obtaining biomass samples and having them analyzed at the Lahore Engineering and Technology University or another laboratory of the same or higher caliber. The Grantee shall be responsible for covering the cost of laboratory analysis.
- Assess biomass collection and transportation to the Grantee site.
- Assess biomass storage and fuel preparation.
- Assess and recommend best type of combustion technology.
- Assess and recommend air emission control technology.
- Select site for the 35-50MW power plant.
- Prepare land requirement, plant layout, civil, mechanical, electrical, and equipment layout at the site.
- Assess power plant connection and power export/import mechanism with existing Grantee grid station and national NTDC power network.
- Discuss quantity of make-up water required, recycling and treatment options. Provide schematics as well as description of alternatives.
- Assess ash disposal and recycling options.
- Prepare project implementation timeline.

Task 5: Preliminary Environmental Overview

The Contractor shall complete a preliminary environmental overview. A comprehensive environmental assessment is not part of this feasibility study. Only major environmental impact issues should be addressed along with their mitigation measures. A subsequent, more detailed environmental assessment report will, most likely, be required by the Pakistani government's environmental agency as well as international lenders if they provide financing. The Contractor shall develop plans for the full environmental impact assessment in anticipation of the Project moving forward to the implementation stage.

The Contractor shall evaluate the following elements:

- Site Location and Access
- Background Environmental Conditions
- Statutory Requirements for Environmental Protection
- Socio-Economic Setting
- Adverse Environmental Impacts
- Environmental Management and Monitoring
- Permit Requirements
- Resources and References
- Obtainable CDM Credits

Deliverable: A preliminary environmental overview shall be presented as a written report.

Task 6: Detailed Cost and Economic Analysis

The Contractor shall conduct a thorough cost and economic analysis of the following four items:

6.1 Energy Efficient Equipment Replacement

- Capital costs for installation of energy efficient equipment
- Estimated energy savings

6.2 Waste Heat Recovery Unit

- Capital costs for installation of a WHR unit
- Net heat recovery
- Operations and Maintenance (O&M) costs

6.3 New 35-50 MW Power Generation Unit

- Biomass fuel costs
- Biomass fuel preparation and on site storage costs
- Capital costs for installation of a 35-50 MW biomass-fired power generation plant
- Detailed operations and maintenance costs for:
 - Fuel transportation
 - Fuel storage
 - Fuel preparation
 - Power plant operation

6.4 Estimated Revenues Generated

- Incremental revenues derived from installation of energy efficient equipment
- Incremental revenues derived from installation of a WHR unit
- Revenues generated from a 35-50 MW biomass-fired power plant

Deliverable: For purposes of performing the Cost and Economic Analysis, the Contractor shall assume industry standards for plant reliability, availability, and scheduled and unscheduled outages. Under this task the following data shall be clearly calculated and provided in a report: Project capital costs; Project O&M cost; biomass fuel cost; projected revenue stream; and obtainable carbon credits.

Task 7: Detailed Financial Analysis and Financing Plan

The Contractor shall conduct a financial analysis of the project using a spreadsheet-based life cycle cost model. The Contractor shall share a soft copy of this life cycle model with the Grantee along with a hard copy of the relevant assumptions and results.

The model shall incorporate all technical and financial data and will analyze the cost of biomass generated power over the life of the project.

The model shall be structured in a flexible manner allowing the user to either:

- Enter a specific tariff and derive the resulting return on equity (ROE), internal rate of return (IRR) and net present value (NPV).
- Enter a target ROE and derive the tariff which is required to achieve that return.

The model shall also take into account lenders' considerations. The financial analysis will be based on nominal prices. All relevant taxes and duties will be taken into consideration. The following indicators of financial feasibility will be derived:

- Project net present value
- Project internal rate of return
- Return on equity
- Debt management ratios

Sensitivity tests shall be conducted to identify the project's key input parameters which affect the project's financial parameters most significantly.

Deliverable: The Contractor shall, in coordination with the Grantee, draft a financing plan that provides a realistic mix of local and international debt and equity financing.

Task 8: Carbon Credit Analysis

As the current commitment period of the Kyoto Protocol draws to a close in 2012, future demand for carbon emission reductions is expected to be driven by the outcome of agreements, and from emerging national and regional climate policies. The required commitments of Annex 1 countries (industrialized and countries in transition which have ratified the Kyoto Protocol) beyond 2012 are currently unclear and therefore the future market for Certified Emission Reductions (CERs) is also uncertain. Based on current information from the World Bank and other applicable institutions, the Contractor shall:

- Report on the availability of CERs or any other applicable carbon credits.
- If available, assess the applicability of Clean Development Mechanism (CDM) as partial source of financing for the envisaged projects, which can directly influence the cash flow of the financial model.
- Estimate the quantity and market value of carbon credits based on displacement of fossil fuel used by the Pakistan Water and Power Development Authority (WAPDA)

Deliverable: Upon completion of this task, the Contractor shall provide a written report with conclusions and recommendations of this analysis.

Task 9: Regulatory Analysis

The Grantee plans to sell excess power generated by the biomass-fired plant to the national grid. Electric power regulations, tariffs, and interconnection requirements are governed by the National Electric Power Regulatory Authority (NEPRA), and renewable energy plants are further governed by the Alternative Energy Development Board (AEDB). Coordination will be required with the NTDC for determining engineering specifications and equipment needs to connect to the nearest national grid's substation. In light of the above considerations, the Contractor shall review all approval and permitting procedures related to NEPRA and AEDB. The Contractor shall also coordinate with the NTDC to review engineering specifications and equipment required to connect to the grid.

In addition the Contractor shall review the following specific regulations pertinent to this project:

- Relevant national electric power sector policies and regulations
- Relevant AEDB renewable energy sector policies and regulations
- Available Carbon Credits

Task 10: Development Impact Analysis

The Contractor shall report on project impacts on infrastructure, technology transfer and productivity enhancement, and human capacity building. The analysis shall focus on the development impacts that are likely to occur if the project is implemented according to the study recommendations. While specific attention shall be paid to the immediate impacts of the project, the analysis shall also include any additional developmental benefits that may result from the project's implementation, including spin-off and demonstration effects. Specific issues to be discussed and reported are as follows:

(1) Infrastructure: Provide a statement on the infrastructure impact, giving a brief synopsis. For example, "The project would result in the construction of a power plant that would provide 500 MW of power. This plant would serve ___[number] additional households in ___ [area]."

(2) Technology Transfer and Productivity Enhancement: Provide a description of any advanced technologies that would be utilized as a result of the project. Describe any efficiencies that would be gained (e.g. "By upgrading the power plant's boilers, efficiency will be increased from x% to y%").

(3) Human Capacity Building: Assess the number and type of local positions that would be needed to construct and operate the proposed project, as well as the number of local people who would receive training. Describe potential training programs.

(4) Other: Describe any other significant developmental impacts or benefits that would result from the project, for example, follow-on or replication projects, a safer workplace, increased good governance, or improved financial revenue flows to the Host Country.

Task 11: Implementation Plan

The Contractor shall review, analyze, and discuss various implementation options with the Grantee. The Contractor shall provide a written implementation plan which shall include the following:

- 35-50 MW biomass plant ownership and management options.
- Advantages of proceeding with an EPC contract to implement a biomass-fired power plant.
- Recommended biomass collection and transportation equipment.
- Recommended technology and major combustion equipment and environmental control specifications.

- Ash disposal/ and or recycling options.
- Schematic layout of the proposed biomass combustion plant.
- Grid connection options and a single line diagram showing connections with the existing plant distribution network.
- Detailed implementation schedule.

Deliverable: The Contractor shall submit to the Grantee an Implementation Plan as described above in Task 11.

Within 30 days of submission of the Task 11 deliverable, the Grantee will determine in its sole discretion whether the Study supports a biomass power plant. If the Grantee determines that the Study does support such a plant, Contractor shall proceed and complete Tasks 12, 13 and 14. If the Grantee determines that the Study does not support a biomass plant, the Contractor shall proceed and complete only Tasks 12 and 14.

If the Grantee decides that the Study does not support a biomass plant, the Grantee and Contractor shall notify USTDA in writing and Task 13 shall be eliminated from the Study. If Task 13 is eliminated from the Terms of Reference, the Contractor shall not be paid for Task 13, and the Grantee shall not receive the benefit of Task 13. If Task 13 is eliminated from the Terms of Reference, the amount of \$77,600, which is the budgeted cost for Task 13, shall be eliminated from the budget. Accordingly, the USTDA Grant shall be reduced by \$77,600, and such funds shall be de-obligated.

If the Grantee decides that the Study supports a biomass plant, the Grantee and Contractor shall notify USTDA in writing and provide an estimated completion date of the remaining work to be performed under the Terms of Reference. USTDA will notify the Grantee and Contractor of the authority to proceed with the remaining work under these Terms of Reference.

Task 12: U.S. Sources of Equipment and Services

The Contractor shall provide a listing of all relevant U.S. sources of technology, equipment, and suppliers in the Final Report (Task 14). The list shall include major U.S.-based EPC contractors, technology vendors, and engineering firms interested in implementing this project. Prospective U.S. Sources of Supply in the Final Report shall be submitted to USTDA in accordance with Clause I of Annex II of the Grant Agreement.

Task 13: Preparation of Tender Documents

Upon completion of the previous twelve tasks the Contractor shall proceed with the preparation of tender documents for an EPC contract to design and construct the recommended biomass power generation plant. The tender document shall follow the guidelines of the *Fédération Internationale des Ingénieurs-Conseils* (International Federation of Consulting Engineers, FIDIC).

At a minimum the tender document shall include the following sections:

1. Instructions to Offerors
2. General Conditions of the Contract
3. Particular Conditions of the Contract
4. Project Technical Requirements
 - Process Description and Scope of Supply
 - Design Data / Fuel specifications
 - Capacity / Availability
 - Technical Guarantees
 - Environmental Guarantees
 - Performance Guarantees
 - Process equipment
 - Fuel Feeding System
 - Boiler System
 - Flue Gas Treatment System /Stack
 - Ash Handling System
 - Pumps, Ductwork, valves and fans
 - Electrical equipment
 - Control and Monitoring System
 - Operation assistance after Commissioning
 - Structural Requirements
 - Platforms, Ladders and Stairways
 - Welding
 - Surface Protection
 - Contractor's Documents
 - Structural Data
 - Electrical Data
 - Automation Data
 - Mechanical Data
5. Drawings & Process Diagrams
 - Layout drawings
 - Plan - and Sectional Drawing
 - Process Diagrams
 - Process Flow Diagram Boiler
 - Process Flow Diagram Fuel Handling
 - Main distribution system
 - Overall control and monitoring system

Deliverable: The Contractor shall prepare draft tender documents and present them to the Grantee for discussion and comments. After receiving comments from the Grantee, the Contractor shall proceed to finalize the tender documents.

Task 14: 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 J of Annex II of the Grant Agreement. The Final Report must contain an executive summary and a conclusions and recommendations section.

A N N E X 6

U.S. FIRM INFORMATION FORM



USTDA-Funded Feasibility Study, Technical Assistance, or Training Grant

U.S. Firm Information Form

This form is designed to enable the U.S. Trade and Development Agency ("USTDA") to obtain information about entities and individuals proposed for participation in USTDA-funded activities. Information in this form is used to conduct screening of entities and individuals to ensure compliance with legislative and executive branch prohibitions on providing support or resources to, or engaging in transactions with, certain individuals or entities with which USTDA must comply.

USTDA Activity Number *[To be completed by USTDA]*

Activity Type <i>[To be completed by USTDA]</i>	Feasibility Study	Technical Assistance	Other (specify)
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Activity Title *[To be completed by USTDA]*

Full Legal Name of U.S. Firm

Business Address (street address only)

Telephone	Fax	Website
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Year Established (include any predecessor company(s) and year(s) established, if appropriate).
Please attach additional pages as necessary.

Please provide a list of directors and principal officers as detailed in Attachment A. Attached? Yes No

Type of Ownership	Publicly Traded Company
	Private Company
	Other (please specify)

If Private Company or Other (if applicable), provide a list of shareholders and the percentage of their ownership. In addition, for each shareholder that owns 15% or more shares in U.S. Firm, please complete Attachment B.

Is the U.S. Firm a wholly-owned or partially owned subsidiary?	Yes <input type="checkbox"/> No <input type="checkbox"/>
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If so, please provide the name of the U.S. Firm's parent company(s). In addition, for any parent identified, please complete Attachment B.

Is the U.S. Firm proposing to subcontract some of the proposed work to another firm?	Yes <input type="checkbox"/> No <input type="checkbox"/>
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If yes, U.S. Firm shall complete Attachment C for each subcontractor. Attached?	Yes <input type="checkbox"/> Not applicable <input type="checkbox"/>
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Project Manager

Name	Surname	
	Given Name	
Address		
Telephone		
Fax		
Email		

Negotiation Prerequisites

Discuss any current or anticipated commitments which may impact the ability of the U.S. Firm or its subcontractors to complete the Activity as proposed and reflect such impact within the project schedule.

Identify any specific information which is needed from the Grantee before commencing negotiations.

U.S. Firm may attach additional sheets, as necessary.

U.S. Firm's Representations

U.S. Firm shall certify to the following (or provide any explanation as to why any representation cannot be made):

1. U.S. Firm is a [check one] Corporation LLC Partnership Sole Proprietor Other:
 duly organized, validly existing and in good standing under the laws of the State of:
 The U.S. Firm 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 USTDA Activity. The U.S. Firm 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 U.S. Firm has included herewith, a copy of its Articles of Incorporation (or equivalent charter or document issued by a designated authority in accordance with applicable laws that provides information and authentication regarding the legal status of an entity) and a Certificate of Good Standing (or equivalent document) issued within 1 month of the date of signature below by the State of:
 The U.S. Firm commits to notify USTDA and the Grantee if it becomes aware of any change in its status in the state in which it is incorporated. USTDA retains the right to request an updated certificate of good standing.
3. Neither the U.S. Firm nor any of its principal officers have, within the ten-year period preceding the submission of this proposal, 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 U.S. Firm, 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 U.S. Firm. The U.S. Firm, has not, within the three-year period preceding the submission of this proposal, been notified of any delinquent federal or state taxes in an amount that exceeds US\$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 U.S. Firm has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself of its debts under any bankruptcy, insolvency or other similar law. The U.S. Firm has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.
7. The U.S. Firm certifies that it complies with USTDA Nationality, Source, and Origin Requirements and shall continue to comply with such requirements throughout the duration of the USTDA-funded activity. The U.S. Firm commits to notify USTDA and the Grantee if it becomes aware of any change which might affect U.S. Firm's ability to meet the USTDA Nationality, Source, and Origin Requirements.

The U.S. Firm shall notify USTDA if any of the representations are no longer true and correct.

U.S. Firm certifies that the information provided in this form is true and correct. U.S. Firm understands and agrees that the U.S. Government may rely on the accuracy of this information in processing a request to participate in a USTDA-funded activity. If at any time USTDA has reason to believe that any person or entity has willfully and knowingly provided incorrect information or made false statements, USTDA may take action under applicable law. The undersigned represents and warrants that he/she has the requisite power and authority to sign on behalf of the U.S. Firm.

Name	<input type="text"/>	Signature	<input type="text"/>
Title	<input type="text"/>		
Organization	<input type="text"/>	Date	<input type="text"/>



ATTACHMENT B

USTDA-Funded Feasibility Study, Technical Assistance, or Training Grant

U.S. Firm Information Form – Shareholder(s) and Parent Company(s)

If applicable, U.S. Firm provided a list of shareholders and the percentage of their ownership. This form shall be completed for each shareholder that owns 15% or more shares in U.S. Firm, as well as any parent corporation of the U.S. Firm ("Shareholder"). In addition, this form shall be completed for each shareholder identified in Attachment B that owns 15% or more shares in any Shareholder, as well as any parent identified in Attachment B.

USTDA Activity Number [To be completed by USTDA]	
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Activity Title [To be completed by USTDA]	
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Full Legal Name of U.S. Firm	
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Full Legal Name of Shareholder	
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Business Address of Shareholder (street address only)	
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Telephone number		Fax Number	
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Year Established (include any predecessor company(s) and year(s) established, if appropriate). Please attach additional pages as necessary.	
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Country of Shareholder's Principal Place of Business	
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Please provide a list of directors and principal officers as detailed in Attachment A. Attached?	Yes
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Type of Ownership	<input type="checkbox"/> Publicly Traded Company
	<input type="checkbox"/> Private Company
	<input type="checkbox"/> Other

If applicable, provide a list of shareholders and the percentage of their ownership. In addition, for each shareholder that owns 15% or more shares in Shareholder, please complete Attachment B.	
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Is the Shareholder a wholly-owned or partially owned subsidiary?	<input type="checkbox"/> Yes
	<input type="checkbox"/> No

If so, please provide the name of the Shareholder's parent(s). In addition, for any parent identified, please complete Attachment B.	
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Shareholder may attach additional sheets, as necessary.



ATTACHMENT C

USTDA-Funded Feasibility Study, Technical Assistance, or Training Grant

Subcontractor Information Form

This form is designed to enable the U.S. Trade and Development Agency ("USTDA") to obtain information about entities and individuals proposed for participation in USTDA-funded activities. Information in this form is used to conduct screening of entities and individuals to ensure compliance with legislative and executive branch prohibitions on providing support or resources to, or engaging in transactions with, certain individuals or entities with which USTDA must comply.

USTDA Activity Number [<i>To be completed by USTDA</i>]	
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Activity Title [<i>To be completed by USTDA</i>]	
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Full Legal Name of Prime Contractor U.S. Firm ("U.S. Firm")	
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Full Legal Name of Subcontractor	
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Business Address of Subcontractor (street address only)	
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Telephone Number	
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Fax Number	
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Year Established (include any predecessor company(s) and year(s) established, if appropriate). Please attach additional pages as necessary.	
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Subcontractor Point of Contact

Name	Surname	
	Given Name	

Address	
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Telephone	
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Fax	
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Email	
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Subcontractor's Representations

Subcontractor shall provide the following (or any explanation as to why any representation cannot be made), made as of the date of the proposal:

1. Subcontractor is a <i>[check one]</i>	<input type="checkbox"/> Corporation	<input type="checkbox"/> LLC	<input type="checkbox"/> Partnership	<input type="checkbox"/> Sole Proprietor	<input type="checkbox"/> Other
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duly organized, validly existing and in good standing under the laws 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 U.S. Firm is selected, to execute and deliver a subcontract to the U.S. Firm for the performance of the USTDA Activity and to perform the USTDA Activity. 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 ten-year period preceding the submission of the Offeror's proposal, 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.

6. The Subcontractor certifies that it complies with the USTDA Nationality, Source, and Origin Requirements and shall continue to comply with such requirements throughout the duration of the USTDA-funded activity. The Subcontractor commits to notify USTDA, the Contractor, and the Grantee if it becomes aware of any change which might affect U.S. Firm's ability to meet the USTDA Nationality, Source, and Origin Requirements.

The selected Subcontractor shall notify the U.S. Firm, Grantee and USTDA if any of the representations included in its proposal are no longer true and correct.

Subcontractor certifies that the information provided in this form is true and correct. Subcontractor understands and agrees that the U.S. Government may rely on the accuracy of this information in processing a request to participate in a USTDA-funded activity. If at any time USTDA has reason to believe that any person or entity has willfully and knowingly provided incorrect information or made false statements, USTDA may take action under applicable law. The undersigned represents and warrants that he/she has the requisite power and authority to sign on behalf of the Subcontractor.

Name		Signature	
Title			
Organization		Date	