

REQUEST FOR PROPOSALS



FEASIBILITY STUDIES FOR A SMART GRID APPLICATION IN ECG

RFP NO. USTDA/ECG FS/13

MARCH 2013

Submission Deadline: **5:00 PM**
LOCAL (ACCRA) TIME
APRIL 26, 2013

Submission Place: **ELECTRICITY COMPANY OF GHANA LIMITED (ECG)**
DIRECTOR OF ENGINEERING
ATTN: MR. KWAME KPEKPENA
ELECTRO-VOLTA HOUSE
5TH FLOOR, DIRECTOR OF ENGINEERING'S OFFICE
ACCRA, GHANA

TELEPHONE: (+233) 302 676719
FAX: (+233) 302 676718

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

SECTION 1: INTRODUCTION	5
1.1 BACKGROUND SUMMARY.....	5
1.2 OBJECTIVE	5
1.3 PROPOSALS TO BE SUBMITTED	6
1.4 CONTRACT FUNDED BY USTDA.....	6
SECTION 2: INSTRUCTIONS TO OFFERORS	7
2.1 PROJECT TITLE.....	7
2.2 DEFINITIONS.....	7
2.3 DEFINITIONAL MISSION REPORT	7
2.4 EXAMINATION OF DOCUMENTS	7
2.5 PROJECT FUNDING SOURCE.....	8
2.6 RESPONSIBILITY FOR COSTS	8
2.7 TAXES.....	8
2.8 CONFIDENTIALITY.....	8
2.9 ECONOMY OF PROPOSALS	8
2.10 OFFEROR CERTIFICATIONS	8
2.11 CONDITIONS REQUIRED FOR PARTICIPATION	8
2.12 LANGUAGE OF PROPOSAL.....	9
2.13 PROPOSAL SUBMISSION REQUIREMENTS	9
2.14 PACKAGING	9
2.15 OFFEROR’S AUTHORIZED NEGOTIATOR	10
2.16 AUTHORIZED SIGNATURE	10
2.17 EFFECTIVE PERIOD OF PROPOSAL	10
2.18 EXCEPTIONS	10
2.19 OFFEROR QUALIFICATIONS	10
2.20 RIGHT TO REJECT PROPOSALS	10
2.21 PRIME CONTRACTOR RESPONSIBILITY	10
2.22 AWARD	11
2.23 COMPLETE SERVICES	11
2.24 INVOICING AND PAYMENT	11
SECTION 3: PROPOSAL FORMAT AND CONTENT	12
3.1 EXECUTIVE SUMMARY	12
3.2 U.S. FIRM INFORMATION.....	13
3.3 ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL	13
3.4 TECHNICAL APPROACH AND WORK PLAN	13
3.5 EXPERIENCE AND QUALIFICATIONS	13
SECTION 4: AWARD CRITERIA	14

ANNEX 1	FEDBIZOPPS ANNOUNCEMENT
ANNEX 2	PORTIONS OF BACKGROUND DEFINITIONAL MISSION REPORT
ANNEX 3	USTDA NATIONALITY REQUIREMENTS
ANNEX 4	USTDA GRANT AGREEMENT, INCLUDING MANDATORY CONTRACT CLAUSES
ANNEX 5	TERMS OF REFERENCE (FROM USTDA GRANT AGREEMENT)
ANNEX 6	U.S. FIRM INFORMATION FORM
ANNEX 7	USTDA MODEL CONTRACT TEMPLATE

Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US\$646,000 to the Electricity Company of Ghana Limited (“ECG”) (the “Grantee”) in accordance with a grant agreement dated December 6, 2012 (the “Grant Agreement”) to fund the cost of goods and services required for a feasibility study (“Study” or “Feasibility Study”) to evaluate the technical, financial, environmental, and other critical aspects of a proposed Smart Grid Applications project (“Project”) in Ghana (“Host Country”). The Study will make recommendations for a system that would assist ECG’s business process planning and decision making. In addition, the Study will include training that will build the capacity of ECG’s staff to implement the Study’s recommendations, and will supply ECG with an assessment of its training needs and a blueprint for a follow-on training plan.

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

ECG is responsible for electricity distribution in southern Ghana, where it currently serves approximately 2.5 million customers. ECG is growing rapidly to facilitate demand and is targeting investments focusing on improving the quality of its network. ECG suffers from approximately 40 percent distribution losses due to older infrastructure, an inability to document collections, and improper energy audits as its system is not properly digitized. In addition, ECG noted that training is needed at all levels of its staff to build the human capacity necessary to implement and operate a distribution network at international standards. As such, ECG has prioritized the implementation of projects which will help reduce its losses, lead to almost complete automation in ECG’s distribution management, and reengineer its business processes through the use of smart grid and smart meter technologies.

In order to help ECG meet its goals and ensure its success as a modern distribution utility, USTDA assistance will support ECG to develop the planning and technical design aspects of a high-level distribution systems integration strategy. The Study will make recommendations for a system that will address ECG’s business process planning and decision-making. In addition, the Study will include training that will build the capacity of ECG’s staff to implement the Study’s recommendations, and will supply ECG with an assessment of its training needs and a blueprint for a follow-on training plan.

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

1.2 OBJECTIVE

The objective of the Feasibility Study is to provide the Grantee with analyses, recommendations, and training that will support the Grantee's ability to provide cost-effective and reliable service using an integrated and automated distribution system coupled with a full integration of its business processes.

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\$646,000. **The USTDA grant of US\$646,000 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\$646,000 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 ECG Smart Grid Applications.

2.2 DEFINITIONS

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

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

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

2.3 DEFINITIONAL MISSION REPORT

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. Portions of the 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\$646,000.

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:

Electricity Company of Ghana Limited (ECG)
Attn: Mr. Kwame Kpekpena
Director of Engineering
Electro-Volta House
P.O. Box GP 521
Accra, Ghana

Offerors shall submit an Original and eight (8) copies of their proposals.

Proposals shall be delivered to the address shown below at or before **5:00PM Local (Accra) time on April 26, 2013**

The Director of Engineering
Electricity Company of Ghana
Head Office (Electro-Volta House)
5th Floor, Director of Engineering's Office
Accra, Ghana

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 eight (8) 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\$646,000, which is a fixed amount.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

Each proposal must include the following:

- Transmittal Letter,
- Cover/Title Page,
- Table of Contents,
- Executive Summary,
- 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.

Offerors shall provide a list of similar projects undertaken in the past. 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.

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.

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:

Item	CRITERIA	SUB-CRITERIA	Maximum Points to be Awarded
1	Specific experience of the Consultant relevant to the assignment	Experience of Consultant in similar Projects	
		1-2 Projects	4
		3-4 Projects	8
		5 or more Projects	10
	Sub total 1		10
2	Adequacy of the proposed methodology and work plan in	Technical approach and methodology	15

	responding to the Terms of Reference	Work plan	9
		Organization and staffing	6
	Sub total 2		30
3	Experience in the field of assignment	<u>Team Leader</u>	
		Education (Master's or above)	8
		Membership of Professional Body	2
		General Engineering Work Experience	5
		Work Experience in the field of the assignment	15
		Total	30
		<u>One Technical Expert</u>	
		Education (1st degree or above)	4
Membership of Professional Body	1		
General Engineering Work Experience	5		
Work Experience in the field of the assignment	10		
Total	20		
	Sub total 3		50
4	Suitability of the transfer of knowledge (training program)	Relevance of training program	3
		Training approach and methodology	2
		<u>Qualifications of experts and trainers</u>	
		First Degree	3
		Masters and above	5
	Sub total 4		10
	TOTAL		100

Proposals that do not include all requested information may be considered non-responsive. Price will not be a factor in contractor selection.

ANNEX 1

ELECTRICITY COMPANY OF GHANA LIMITED (ECG)
ATTN: MR. KWAME KPEKPENA
DIRECTOR OF ENGINEERING
ELECTRO-VOLTA HOUSE
P.O. BOX GP 521
ACCRA, GHANA

TELEPHONE: (+233) 302 676719
FAX: (+233) 302 676718

ECG Smart Grid Applications (USTDA Activity No. 2013-11002A)

POC: Anthony O'Tapi, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. ECG Smart Grid Applications Project. 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 ("Study") to evaluate the technical, financial, environmental, and other critical aspects of a proposed Smart Grid Applications project ("Project") in Ghana ("Host Country"). The Study will make recommendations for a system that would assist the Electricity Company of Ghana Limited's (ECG) business process planning and decision making. In addition, the Study will include training that will build the capacity of ECG's staff to implement the Study's recommendations, and will supply ECG with an assessment of its training needs and a blueprint for a follow-on training plan.

ECG is responsible for electricity distribution in southern Ghana, where it currently serves approximately 2.5 million customers. ECG is growing rapidly to facilitate demand and is targeting investments focusing on improving the quality of its network. As such, ECG has prioritized the implementation of projects which will help reduce its losses, lead to almost complete automation in ECG's distribution management, and reengineer its business processes through the use of smart grid and smart meter technologies. In order to help ECG meet its goals and ensure its success as a modern distribution utility, USTDA assistance will support ECG to develop the planning and technical design aspects of a high-level distribution systems integration strategy. The Study will make recommendations for a system that will address ECG's business process planning and decision-making. In addition, the Study will include training that will build the capacity of ECG's staff to implement the Study's recommendations, and will supply ECG with an assessment of its training needs and a blueprint for a follow-on training plan.

The U.S. firm selected will be paid in U.S. dollars from a \$646,000 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/desk study report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to: <https://www.usda.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 local (Accra) time, April 26, 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.

ANNEX 2



U.S. Trade and Development
Agency

Definitional Mission: Ghana and Nigeria Power Projects

Project No. CO201211226

(Second Draft Final Report)

November 13, 2012

Prepared by

CORE International, Inc.
5101 Wisconsin Avenue, N.W., Suite 305
Washington, DC 20016



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.

Mailing and Delivery Address: 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901
Phone: 703-875-4357 • **Fax:** 703-875-4009 • **Web site:** www.ustda.gov • **email:** info@ustda.gov

The U.S. Trade and Development Agency

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

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

Executive Summary

Project Background

In August 2012, the U.S. Trade and Development Agency (USTDA) selected CORE International, Inc. to conduct a Definitional Mission to Ghana and Nigeria to evaluate power sector projects and recommend at least three actions for USTDA's funding consideration based on USTDA's criteria for financing grants for feasibility studies and technical assistance. A key requirement of the DM was to coordinate the part of the DM with the Millennium Challenge Corporation (MCC) as MCC is preparing a Compact to finance power sector rehabilitation projects in Ghana.

Objectives of the Definitional Mission

The objective of this DM was to visit Ghana and Nigeria for approximately two weeks, hold discussions with key power sector officials in the two countries, select a number of projects and recommend at least three key actions for USTDA. Specifically, the following activities were required as part of the evaluation process for each of the projects and technical assistance requests from the officials in the two countries:

- Technical assessment of the project's' viability and replication
- Project costs and benefits and the projects' financial viability
- Economic benefits of the projects in in the two countries
- Potential financability of the projects
- Potential for U.S. exports of goods and services for the implementation of the projects
- Development and social impacts of the projects
- Environmental impacts of the projects
- Impact on U.S. jobs and U.S. industry engaged in the power sector development in the two countries.

CORE's scope of work required us to submit a detailed report documenting the above analysis and developing the Terms of Reference and budget for the projects and technical assistance activities if they met USTDA's criteria for funding.

1 Project Description

1.1 Power Sector Background and Opportunities in Ghana

1.1.1 Power Sector Background in Ghana

Context: Ghana currently gets about 70% of its electricity from hydropower stations, but it aims to supply 10% of its domestic demand through modern renewable technologies by 2020. The current national access to electricity supply is about 43% of the population yet over 80% of the domestic electricity supply is consumed in cities and towns. Currently, the country has an installed capacity of 1960 MW made up of hydropower stations and thermal facilities.

Ghana has an extensive transmission system, which covers all the regions of the country. Transmission infrastructure has, however, deteriorated over the years, resulting in transmission bottlenecks, overloaded transformer sub stations, and high system losses. The electricity distribution infrastructure is extensive providing access to about 66% of the population. However, it is old and obsolete, leading to frequent interruptions in power supply and relatively high system losses. While national electricity access is about 66%, access in the three northern regions is about 30%.

Major energy sources in Ghana include petroleum, gas, hydropower, and wood fuels. Ghana is looking to explore and integrate more alternative energy sources such as solar, wind, and waste to energy, into its national power mix. Renewable energy is estimated to make up less than 0.01% in the current of the national energy mix. One reason is because of the high start up and production costs of renewable technologies. But Ghana is working to utilize cost-effective technologies and provide tax and other financial incentives to attract private sector investments in renewable energy technologies.

Renewable Energy Potential in Ghana: The development of wind energy resource for commercial power generation in Ghana is steadily taking center stage of national discourse. Preliminary wind resource assessments results in selected sites along the coasts and high elevations showed moderate to excellent wind potentials. Especially, sites with good wind regimes are those along the east coastlines. The gross wind electric potential is about 5,600 MW representing some 1,128 km². Infrastructure such as road, grid network and load centers coincide with most areas where these wind potentials exist.

Solar Energy Resource Potential: Ghana is endowed with enormous solar energy resource spread across the entire country. Daily solar irradiation level ranges from 4 kWh/m² to 6 kWh/m². Areas of highest irradiation levels are spread across the entire northern belt, which represents over 60% of the total national, land mass. The annual sunshine duration ranges between 1800 to 3000 hours offering very high potential for

grid connected and off-grid applications. Over 6,000 solar systems with an installed capacity of 3.2 MW have been installed in the country mainly for off-grid applications.

Hydropower Resource Potential: The potential exploitable hydro resource for Ghana is about 2500 MW. Already, 1,180 MW of this potential have been developed and operational at Akosombo and Kpong. An additional 400 MW is under construction, bringing the total exploited capacity to 1,580 MW or about 60%. The remaining 840 MW capacity is located at about 21 sites with capacities ranging from medium (95 MW) to small (17 MW) hydropower potentials. The Directorate focuses on promoting and developing the country’s small hydropower (SHP) potential considered below 40 MW.

Bioenergy Resource Potential: Ghana has appreciable bioenergy potential with biomass energy in the form of wood fuel and charcoal consumption accounting for about 72% of total energy consumption. Two-thirds of the country or 18.3 Mha is under tree cover. The climatic and soil conditions are very suitable for large-scale agriculture, energy crops, and sustainable wood fuel productions. It is estimated that with annual rainfall of 1,300 – 2,200 mm, about 243 PJ/yr or 65,000 GWh/yr of wood fuel could be obtained from the existing tropical forests.

Transmission and Distribution Potential: In addition to power generation, Ghana needs to rehabilitate its transmission and distribution assets. It is estimated that rehabilitation of the current T&D system alone would require an investment of over \$400 million. In addition, to keep pace with demand and increase access of power to peri-urban and rural areas could take an additional \$500 million. Major interconnection projects with neighboring countries and under the planning of the West African Power Pool (WAPP) are expected to require over \$2 billion in HV transmission networks and substation.

Key Energy Sector Institutions in Ghana: Exhibit 2 lists the key energy sector institutions in Ghana that will be visited during the DM in addition to private project sponsors and companies that have already approached the American Embassy with project requests.

Exhibit 2: Key Energy Sector Institutions in Ghana

AGENCY	RESPONSIBILITIES
<p><u>POWER SUB-SECTOR</u></p> <ul style="list-style-type: none"> • Volta River Authority (VRA) • Bui Power Authority • Independent Power Producers (IPPs) • Ghana Grid Company (GRIDCo) • Electricity Company of Ghana (ECG) • Northern Electricity Department (NED) 	<ul style="list-style-type: none"> • Power Generation • Power Generation • Power Generation • Power Transmission • Power Distribution in Southern Ghana • Power Distribution in Northern Ghana
<p><u>REGULATORY AGENCIES</u></p> <ul style="list-style-type: none"> • Public Utilities Regulatory Commission (PURC) 	<ul style="list-style-type: none"> • Electricity tariffs approval, monitoring quality of service and consumer protection

<ul style="list-style-type: none"> • Energy Commission (EC) • National Petroleum Authority (NPA) 	<ul style="list-style-type: none"> • Licensing of operators in the power sectors and setting technical standards for their performance, sector planning and policy advice to Minister of Energy • Licensing of operators in the petroleum sector and setting of technical standards and enforcement
--	---

The Ministry of Energy is responsible for formulating, monitoring and evaluating policies, programs and projects for the energy sector in general. The Ministry is also responsible implementing the Government’s National Electrification Scheme, which seeks to extend the reach of electricity to all communities in the long term.

Electricity generation is undertaken by the state-owned Volta River Authority (VRA), which operates the Akosombo Hydro Power Station, Kpong Hydro Power Station and the Takoradi Thermal Power Plant (TAPCO) at Aboadze. VRA is also a minority joint partner with TAQA, a private sector company that owns and operates the Takoradi International Power Company (TICO) thermal power plant also located at Aboadze. Bui Power Authority (BPA), another state-owned entity, is charged with the implementation of the Bui Hydro electric Power Project.

The distribution of electricity is mainly done by two state-owned enterprises, namely the Electricity Company of Ghana (ECG) and Northern Electricity Department (NED), which is a subsidiary of VRA. ECG distributes electricity in the southern part of the country; NED distributes power in the northern part of the country, while Enclave Power provides power to the Free Zones.

The Electricity Supply Industry is regulated by the Energy Commission (EC) and the Public Utilities Regulatory Commission (PURC), two key regulators in Ghana. The EC is responsible for technical regulation of the power sector, including licensing of operators. In addition, EC also advises the Minister of Energy on matters relating to energy planning and policy. The PURC is an independent regulatory agency, and is responsible for economic regulation of the power sector, specifically approving rates for electricity sold by distribution utilities to the public. Its functions also include monitoring of quality of electricity services delivered to consumers.

Key Energy Sector Projects in Ghana: Demand for power is currently at 1400 MW and is increasing 10% annually. The Republic of Ghana is working to develop, modernize and diversify their energy sector. There are a variety of projects currently underway to help meet these energy consumption demands. One project, an \$850 million Gas Infrastructure Project at Atuabo is expected to be completed in November 2012. The project will enable the country to transport natural gas from the Jubilee Fields for processing and then transporting to the Aboadze Thermal Plant (still under construction) for generation. Excess gas would then be exported to neighboring countries.

Ghana and its partners on the Jubilee Field, which include Tullow Oil Plc and Anadarko Petroleum Corporation, will invest an estimated \$20 billion over the next 10 years to develop newly discovered oil fields. Jubilee Field currently produces 63,000 barrels of oil per day, but new discoveries in the Deep Water Tano Block will help boost total production.

More than 1500 MW of new electricity capacity is set to come on line over the next 5 years, with 952 MW overseen by the VRA and the remainder by IPPs. The VRA is embarking on a \$40 million renewable energy project, some of which will be invested in solar energy plants. Another project, announced in January 2012, with investments provided by Hella Energy and Environment, a Korean firm that specializes in renewable energy and plans to construct a 300 MW solar power plant in the country.

The Bui Dam is a 400 MW hydropower project that began in 2009 and is expected to be completed in 2013. The project is a collaboration between the Government of Ghana and Sino Hydro, a Chinese construction company. Once fully completed, it will be the third major dam in the country. In addition, independent power producers (IPPs) have been licensed to build, own and operate power plants. The IPP projects are at various stages of development.

Energy Sector Policies in Ghana: The electricity sector in Ghana faces many challenges including: (i) inadequate power supply infrastructure which requires huge investments, (ii) inadequate access to electricity, (iii) high cost of fuel for electricity generation, (iv) inadequate regulatory capacity and enforcement, and (v) operational and management difficulties in utility companies. The Government of Ghana has established and continues to implement key policies that allow the country's energy sector to progress.

One major policy driver is Ghana's "Vision 2020." The government set forth a development strategy aimed at creating a stable macroeconomic environment and implementing a decisive structural transformation to foster strong economic growth and a broad-based improvement of living standards. The strategy envisages steps to achieve balanced social and regional development, and encourage private sector activity and export orientation. The long-term vision for Ghana is to become a middle-income country by the year 2020 through economic growth and development of the country and its people.

In 2011, the Government of Ghana approved a Renewable Energy Law, which seeks to integrate renewable energy security in the country. The Law is to provide for the management, development and utilization of renewable energy (RE); to develop a sustainable and adequate supply of renewable energy; and to provide for related matters. The Renewable Energy Law also establishes a feed-in tariff (FIT) scheme with rates established by PURC, and requires utilities to purchase a specified percentage of its total electricity from renewable energy sources. The Law also established the Ghana

Renewable Energy Fund (GREEN Fund), which will provide financial resources for the promotion, research, development and utilization of renewable energy resources.

The above policies are intended to help achieve the following goals: (i) Ensure adequate, reliable and improved supply of electricity, rehabilitation and expansion of electricity generation, transmission and distribution infrastructure; (ii) Increase access to electricity to at least 80% by 2015; (iii) Secure sources of cost-effective and sustainable fuel supply for electricity generation; (iv) Increase financing for electricity supply infrastructure development from Government sources, Development Partners and the private sector; (v) Strengthen institutional and management capacity as well as regulatory regime for the smooth development and operation of the power sub-sector; and (vi) Ensure cost-effective pricing regime for electricity services.¹

In response to the inadequacies of the power supply infrastructure, the government has proposed increasing generation capacity, reinforcing and adding capacity to the transmission and distribution components, opening up the power sector to IPPs and private sector participation in generation, and strengthening the regulatory environment.

To address the inadequate access to electricity by consumers, the power sector institutions have established policy responses to increase the momentum of the National Electrification Scheme to provide access to electricity progressively to all communities, upgrade and reinforce transmission and distribution network capacity, and open up the sub-sector to private sector participation in power distribution and sale.

1.1.2 Potential Opportunities for USTDA's Assistance

{Redacted}

1.2 Summary of Discussions in the Field Mission in Ghana

{Redacted}

1.3 Projects Identified and Evaluated as Part of the Definitional Mission

The DM identified a number of potential projects in Ghana and Nigeria many of which are at very early stages of discussion. Of all the projects identified, the DM evaluated and is recommending the following projects:

1.3.1 Projects Recommended for Ghana

The DM is recommending the following projects for Ghana:

¹Republic of Ghana Ministry of Energy, "Energy Sector Strategy and Development Plan," http://ghanaoilwatch.org/images/laws/energy_strategy.pdf, 5.

Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana

{Redacted}

1.4 Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana

The proposed “Grantee” for this project is the Electricity Company of Ghana (ECG). ECG is under extreme pressure to reduce distribution losses, improve efficiency, increase collections and enhance the control and operations of its distribution network. Accordingly, ECG is extremely committed to the proposed feasibility study. The DM developed the Terms of reference (TORs) for the proposed feasibility study in close coordination with the proposed “Grantee” who offered useful contributions to the TORs in order to ensure that addresses their key requirements.

The proposed “Grantee” has implemented numerous projects and grants financed by the World Bank, African Development Bank, USAID, DfID (UK), SIDA (Sweden) and other bilateral donors. ECG is very familiar with complying with donor requirements in implementing a variety of grants. Therefore, the DM has concluded that the proposed “Grantee” has the capability to implement the proposed feasibility study successfully.

The following includes some of the major projects implemented by ECG that establish that ECG is fully capable of implementing the project result from the proposed feasibility study:

<u>Project</u>	<u>Period</u>	<u>Amount</u>	<u>Funding Agency</u>	<u>Status</u>
1. DSUP Completed	1992 - 1996	US\$ 15M	World Bank	
2. GEDAP 1 Substantially Completed	2007-2012	US\$ 95M	World Bank, African Dev. Bank	
3. GEDAP II Ongoing	2010 - 2013	US\$ 70M	IDA	
4. NORWEGIAN Ongoing CREDIT	2009 - 2013	Euro 55M	Norwegian Govt.	
5. FRENCH CREDIT Substantially	2010 - 2012	Euro 65M	French Govt.	Compl eted

2 Implementation Financing

This DM is recommending the following four grants to support the power sectors in Ghana and Nigeria:

- Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana

“**Grantee**”: Electricity Company of Ghana

{Redacted}

All of these projects would require international financing for implementing the recommendations of the proposed feasibility study and technical assistance. A number of financing sources would have the opportunity to support project implementation through a variety of financing schemes. The following is a description of the sources that are available to all of the proposed Grantees in Ghana and Nigeria.

2.1 U.S. Sources of Financing

A number of organizations within the U.S. Government provide financing for infrastructure projects to developing countries and emerging economies depending upon the components of the project and their respective criteria for funding. The following are some of the key sources for financing in the U.S:

2.1.1 Millennium Challenge Corporation

The Millennium Challenge Corporation (MCC) is preparing a Compact to finance power sector distribution rehabilitation in Ghana. Currently, the MCC and the Government of Ghana are preparing a Concept Paper that would provide details on the contents of the actual rehabilitation projects that would be financed by the MCC. The focus of the Compact is on power transmission and distribution projects, as these two areas have been identified by the Government of Ghana as the priorities in reforming its power sector. While the DM has no direct knowledge of the details of the Compact under preparation by MCC, it appears that the total amount of financing could be approximately \$250 million. For the projects proposed as part of this DM, MCC would be the key financing source.

It should be noted that the DM has no direct information either from the MCC or the MCA-Ghana regarding the total amount of the Compact and the projects that would be included in the Compact. Some time in the near future, MCC would publish a Concept Paper that would provide further details. Therefore, the information included here is based on discussions with various energy sector officials in Ghana.

2.1.2 The U.S. Export-Import Bank:

The Export-Import Bank of the United States (Ex-Im Bank) provides direct loans to foreign buyers with competitive, fixed-rate financing for their purchases from the United States. The Ex-Im Bank also provides working capital guarantees to cover 90% of the principal and interest on commercial loans to creditworthy small and medium-sized companies that need funds to buy or produce U.S. goods or services for export. For project financing, long-term Ex-Im Bank guarantees of commercial loans are available for major projects, large capital goods acquisitions, and project-related services. Given the competitiveness of U.S. industry in the power sector, U.S. Export-Import Bank financing will be another channel available to U.S. companies for financing projects in Ghana and Nigeria.

2.1.3 The Overseas Private Investment Corporation (OPIC):

OPIC, an agency of the U.S. Government, provides project financing through direct loans and loan guarantees that provide medium-to long term funding for ventures involving significant equity or management participation by U.S. businesses. Since project financing looks for repayment from cash flows generated by projects, OPIC carefully analyzes the economic, technical, marketing and financial soundness of each project. In addition, OPIC provides political risk insurance to U.S. companies for overseas projects. U.S. companies routinely use OPIC to provide insurance against risks in foreign investments. While OPIC would not be financing the infrastructure projects in Ghana and Nigeria, it would be a source for U.S. companies to seek risk insurance associated with investments in the two countries.

2.2 Sources of International Financing

The following are some of the international sources of concessional financing available to Ghana and Nigeria.

2.2.1 Equity and Debt Financing from International Finance Institutions (IFIs):

The World Bank and the African Development Bank are two of the most active IFIs in Ghana and Nigeria. Some of the infrastructure components of the proposed projects could be financed by these institutions. GRIDCo has been the recipient of World Bank financing for some of its coastal transmission lines. In the past the World Bank has financed both transmission and distribution projects in Ghana totaling approximately \$220 million. In addition, the World Bank is considering a new project which would be the next phase of the Ghana Energy Development and Access Project (GEDAP). This project would focus on increasing electricity access. The specific components of the project would include rural electrification, peri-urban electricity access and renewable energy applications.

The African Development Bank (AfDB) has also been active in financing power projects in Ghana. The largest project financed by the AfDB was the Euro 179 million North-South transmission line to strengthen the backbone line for evacuating power from the power-rich South to demand centers in the North..

In addition, GRIDCo informed the DM that it is in discussions with Societe Generale (France) for the financing of the Eastern Transmission line for which USTDA has funded the feasibility study.

In addition, the International Finance Corporation (IFC), the private sector part of the World Bank Group, typically offers both equity investments and financial syndicating services for major energy projects. Specifically, the IFC is exploring opportunities for financing independent power projects (IPPs) in Ghana that would provide additional capacity to meet power demand in the Central and Northern parts of Ghana.

Both the World Bank and the African Development Bank are active in Nigeria as well.

2.2.1.1 Selected World Bank Projects in Ghana

The World Bank's Ghana portfolio comprises US \$1.626 billion in 26 projects. The disbursed amount has been increasing since FY 2009. US \$386.2 million was disbursed in FY 2011, the sixth largest of the International Development Association (IDA), and reached US \$342.9 million in fiscal year 2012, a country record. Regional projects reflect Ghana's role as a hub in West Africa, with a regional portfolio of eight projects of nearly US \$752 million in transport, energy, trade facilitation and agriculture. An IDA guarantee helped the completion of the West Africa Gas Pipeline which connects Nigeria's gas resources to Benin, Togo and Ghana, lowering energy production costs in Ghana.

In the energy sector in Ghana, the World Bank has financed the following projects:

- Ghana Energy Development and Access Project (GEDAP) – improvement of the operation efficiency of power distribution and increase access of electricity. Additional financing in the amount of US \$90 million is being considered to expand and scale up the scope of the project. This project is being implemented by the ECG and new Phase III loan in the amount of \$90 million is being prepared by the Bank.
- Ghana Solar Energy Development Project (4.35 million)
- Ghana Rural Energy Access Project (\$5.5 million)
- Aboadze – Volta 330 kV Transmission Line Project – completed in 2010
- Aboadze – Prestea – Kumasi – Wa 330 kV Transmission Line Project (ongoing, completion expected in 2014).

In addition, ECG, NEDCo, and GRIDCo are implementing a number of smaller technical assistance projects aimed at improving various pieces of the T&D network in the country.

Based on the above discussion, it is clear that all of the proposed projects in Ghana fit the pattern and characteristics of projects that are routinely financed by these institutions. All of the proposed Grantees have well-established relationships with these institutions and are currently implementing projects funded by them.

2.2.2 Bilateral Donor Agencies:

While most bilateral agencies do not finance major projects they can make an important difference at the early stages of the projects as well as during project implementation. Typically, bilateral agencies could provide funding for technical assistance and training that strengthen the project viability and also attract investors and lenders. A number of international bilateral donors are active in Ghana and Nigeria including GTZ (Germany), DfID (UK), USAID, and SIDA (Sweden) who could be approached for co-financing certain components of the proposed projects.

Both countries need considerable capacity building and skills development in the power sector. DfID is currently funding a large multi-year project in Nigeria that includes technical assistance and training activities in Nigeria's transmission and distribution sectors. USAID is contemplating a sizeable technical assistance project that would include training and capacity building in Ghana to facilitate the planned MCC Compact. In addition, the Government of Ghana is in discussions with JICA (Japan) and (SIDA (Sweden) for technical assistance in the power sector. No details are available, as these discussions are at an early stage.

2.2.3 The Multilateral Investment Guarantee Agency (MIGA):

MIGA and OPIC both provide political risk insurance for U.S. exporters involved in international transactions. OPIC insurance is available for investments in new ventures or expansions of existing enterprises and can cover assigned inventory or equipment, exporters' and contractors' exposures, and advance payment and other guarantees posted in favor of foreign buyers. MIGA programs are designed to encourage foreign investment by filling gaps in investment insurance against non-commercial risks in developing countries.

2.2.4 Equity and Debt Financing from the Capital Markets:

Depending upon how the proposed projects are structured and packaged certain components of the overall projects could be eligible for commercial financing, especially if other components of the projects are able to generate concessional financing and if the governments of Ghana and Nigeria are prepared to guarantee some parts of the project.

Ghana and Nigeria enjoy a good reputation among the capital markets as a "destination of choice" for major investments in Africa. Both countries offer extensive opportunities for

investments in the power sector. A large number of U.S. firms and firms from Europe, Australia, and Japan have presence in the countries because of an increasing investment opportunities in the power sector. Therefore, financing is not expected to be a constraint for the recommended projects.

2.3 Estimated Financing Requirements for the Recommended Projects

In consultations with the U.S. firms and discussions with selected technology vendors, the DM Team has estimated the following financing requirements for the proposed projects.

- {Redacted}

2.3.1 Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana

Various estimates for the financing requirements to transform the Electricity Company of Ghana to a world-class distribution utility with losses below 10% and collections over 90% range from \$200 million to \$400 million over the next 5 years. ECG has developed a slate of projects that would require an investment of over \$500 million in Ghana's power sector. The company would need the complete set of distribution automation and smart grid technologies as well as new investments in distribution lines, substations, and transformers to meet the power demand in the Central and Southern parts of Ghana. It is anticipated that the MCC Compact would be in the range of \$250 million. As mentioned earlier, the DM cannot confirm this amount as the MCC is still developing a Concept Paper. If the Compact amount were to be \$250 million, it is expected that approximately \$100 – 125 million could be for priority distribution projects and the remaining could be devoted to transmission projects.

In the early stages of the proposed project, CORE has estimated that the total initial investment required for priority projects planned by the ECG could exceed \$200 million as shown in the next section. This would mean that the MCC Compact would not be able to meet the full financing needs to ECG in the near term. ECG has indicated that it would approach the World Bank and African Development Bank for financing those projects that might not be included in the MCC Compact.

Therefore, a likely financing combination for high priority power distribution projects could be as follows:

- | | |
|----------------------|---------------|
| ■ MCC | \$120 million |
| ■ WB and AfDB | \$200 million |
| ■ Bilateral Agencies | \$20 million |

-
- IFC Financing \$100 million (Leveraged with the private sector)

3 U. S. Export Potential

{Redacted}

3.1 U.S. Companies Contacted as Part of the DM

In addition to a number of blue chip large companies active in Ghana and Nigeria, a large number of small- and medium-sized companies in the U.S. manufacture a wide variety smart meter and demand response technologies and systems. As mentioned previously, a large number of U.S. companies are either already in or are exploring opportunities in growing power sector market in Ghana and Nigeria.

{Redacted}

3.2 List of Selected U.S. Manufacturers and Suppliers of Smart Grid, Distribution Automation, and Smart Meter Technology and Systems

{Redacted}

4 Foreign Competition and Market Entry Issues

{Redacted}

5 Evaluation Strategy

The purpose of this section is to discuss how the projects recommended by CORE International as part of this DM should be evaluated by USTDA after the completion of the studies.

USTDA's Evaluations Department has outlined a number of questions to be answered by DM contractors during the definitional mission phase. The following discussion includes both the USTDA questions and the DM's responses to the questions as best as possible at this stage of the exercise:

- What is the step-by-step process the project will follow to be implemented?

Response: the proposed projects would result in feasibility studies and investment programs for the proposed Grantees in Ghana and Nigeria. All of the recommended projects are of the highest priority in the two countries. The prospective donors (MCC, World Bank, and African Development Bank) have placed very high priority in rehabilitating and modernizing the transmission and distribution systems in the two

countries in order to evacuate and distribute large quantities of power to demand centers. Therefore, the prospective Grantees plan to quickly move to arranging financing and issuing tenders. Based on discussions with the prospective Grantees, the DM feels that all Grantees plan to begin implementation of the projects within 2 years from the completion of the studies. Some of smaller project components may be implemented during the first year as well.

■ What is the anticipated project development timeline?

Response: As mentioned above, all of the proposed projects are of the highest priority in the two countries. These projects are already in the development stage and the feasibility studies would produce bankable documents that would help the Grantees and donors to accelerate the executing of the projects as soon as financing is put in place.

■ Is any regulation needed before the project can be developed (i.e. power purchase agreement standards)?

Response: These projects involve rehabilitation and modernization of Ghana's transmission and distribution networks. All pertinent regulations such as performance benchmarks, key performance indicators (KPIs), grid codes, and quality of supply and service standards have already been issued by PURC in Ghana and NERC in Nigeria. Therefore, no new regulations would need before the proposed projects can be implemented.

■ What should we look for to confirm the project is a success (exports, development impact, other)?

Response: The proposed projects, when implemented would result both in the export of high-end distribution and transmission automation systems, equipment, software, and services. In addition, they would directly improve transmission and distribution efficiency, reduce losses, and improve services to customers. Therefore, they would also result in a host of development impacts such as human capacity enhancement, technology transfer, economic activity, and new job creation. Therefore, USTDA should look for both exports and measurable development impacts of these projects as part of its evaluation strategy.

■ Are there other entities that must authorize/approve implementation?

Response: All proposed Grantees are state companies and, therefore, approval by the Government (ministries in charge of power sector) would be involved in any final approval for project implementation.

■ How are procurements typically conducted in the sector for this country?

Response: ECG, NEDCo, and GRIDCo in Ghana and TCN in Nigeria have implemented scores of projects in the past, which have been funded by a number of international donors. In both countries, the typical procurement approach is consistent with the international competitive bidding (ICB) process recommended by major donors.

The tenders are typically published both in international journals (Development Business) and in local papers and government gazettes.

- Will there be local content requirements?

Response: All proposed projects would require local labor content. The local markets do not produce or supply the kinds of technologies recommended in the projects proposed as part of this DM. Therefore, the DM does not envision any local content for equipment and systems.

- Will a local provider/distributor be involved?

Response: The DM does not anticipate any local provider/distributor for the type of technology and systems that would be procured as and when the projects are implemented.

- Will there be one big procurement or many small procurements? Will other entities be involved if small procurements?

Response: It is difficult to answer this question with any certainty. The typical practice in the transmission and distribution sector procurement is that transmission line projects are procured as a single large procurement. However, distribution projects are often grouped by like systems and hardware requirements (conductors, transformers, IT systems, etc.). The precise choice of the number of tenders would be made after the feasibility studies are completed.

- Are there US companies that already have business with the “Grantee” or in the sector?

Response: A number of U.S. companies are already involved in the power sector in Ghana and Nigeria and quite a few firms are on the fence and looking for opportunities in the two countries. Please see the financing and export potential sections of the DM report.

6 Development Impacts

As part of this DM, CORE International, Inc. has recommended the following four projects:

- Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana

“Grantee”: Electricity Company of Ghana

{Redacted}

All of these projects would have very similar development impacts. Since all of these projects would either increase electricity access or improve electricity service to existing

consumers, they are all expected to result in positive development impacts in Ghana and Nigeria. This section discusses the likely development impacts of the proposed projects in accordance with the guidelines for estimating such impacts provided by USTDA.

6.1 Primary Developmental Benefits from the Proposed Projects

The following types of development impacts are expected as a result of the implementation of the proposed projects if they are found to be feasible and adequate financing is engineered:

6.1.1 Macroeconomic Impacts

These types of impact include overall economic impacts such as GDP growth, inflationary impacts, trade impacts, and other fiscal impacts

6.1.2 Microeconomic Impacts

Employment, income, income distribution, new industries development, etc.

6.1.3 Social Development Impacts

Population movements, development of new communities, capacity building and skills improvement, greater social opportunities, etc.

6.1.4 Technology Transfer Impacts

Application of new technology in the country.

Exhibit 9 summarizes the anticipated development impacts of the projects if they are implemented by the prospective Grantees. These likely impacts are categorized in accordance with USTDA guidelines. The scopes of work prepared for the proposed feasibility studies include a task on estimating the development impacts of the projects in accordance with the specific guidelines provided by the USTDA.

Exhibit 9: Potential Development Impacts of the Proposed Power Sector Projects in Ghana and Nigeria

PROPOSED USTDA GRANT ACTIVITY		TYPE OF IMPACT	DESCRIPTION OF THE IMPACT
1.	Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana	<p><i>Infrastructure Related Impact</i></p> <p><i>Market-Oriented Reform</i></p> <p><i>Human Capacity Building</i></p>	<p>This project will have considerable infrastructure impacts, as the project will result in the installation of a variety of IT systems, data collection devices, two-way communications systems, smart meters, and transformer/substation equipment. The follow-on investments from the project would include additional infrastructure once the IT systems are installed. Thus, the project will have infrastructure-related impact in the outer years well beyond the immediate investments resulting from the project in the Central and Southern parts of Ghana as some of the expansion projects are implemented.</p> <p>The proposed project is focused on the introduction of a wide variety of modern technologies in taking Ghana's distribution sector to the next stage of automation. The project is not expected to directly result in any market-oriented reform. However, as new information is obtained from the distribution automation, Ghana would be able to move to standardize its distribution operations and create a market competition among suppliers of distribution automation technologies and systems.</p> <p>The TORs for the proposed study include the development of a Training Needs Assessment, considerable on-the-job training in distribution system operation and two one-week courses on high priority distribution business processes, very likely, distribution loss reduction, and metering, billing, and collections. The personnel trained under the FS will go on to train scores of other personnel in ECG. In addition, this project has a strong replication potential for the system-wide application of distribution automation throughout Ghana. Thus, there will be direct capacity building of the Ghanaian personnel in various technical and management areas related to power distribution operations and management. It is anticipated the private sector such as the University of Ghana may establish a power sector training program in the country. This would lead to new employment of</p>

PROPOSED USTDA GRANT ACTIVITY		TYPE OF IMPACT	DESCRIPTION OF THE IMPACT
		<p><i>Technology Transfer and Productivity Enhancement</i></p>	<p>technical trainers and instructions, initially estimated to be some 20 trainers.</p> <p>This project is likely to result in significant technology transfer in a number of areas including various infrastructure technologies, IT systems, smart meter technology, and modern management methods aimed at productivity improvements. The procurement of GIS, CIS, OMS, AMS, and various IT integration technologies to be deployed in the entire ECG distribution network and the control centers. All of these technologies and systems will be new to Ghana. As a result, this project will have sizable technology transfer impacts. The transfer of technology would also result in improved productivity as many manual functions will, over time, be transferred to technological solutions.</p>
		<p><i>Other</i></p>	<p>No direct impacts are expected as a result of this project. Indirect impacts include new jobs and income generation in the various communities as a result of improved services and increased electricity access. Furthermore, reduction in losses will reduce utility bills to many consumers as these losses are currently passed on to the consumer through increased tariffs.</p>

7 Impact on the Environment

All four projects would result in the improvement of the existing transmission and distribution systems in Ghana and Nigeria and the construction of new transmission and distribution line and sub-stations. Typical environmental impacts associated with these types are projects include the following:

- Resettlement and right-of-way issues associated with transmission lines related to project affected parties (PAPs) that must be compensated to clear areas for the high voltage transmission lines
- Ecological impacts associated with the routing of the lines through wooded areas and forests
- Oil spill related impacts with leakages around sub-stations and transformers.
- Disposal of batteries and used oil during transformer maintenance.

It should be noted that except for the resettlement requirements and right-of-way issues associated only with transmission line projects, all other environmental issues are common to transmission and distribution projects.

None of the traditional environmental impacts often associated with fossil power plants such as carbon and nitrogen oxides, wastewater, and waste disposal will be present as these are all network projects.

The TORs for each of the recommended projects include a specific task for assessing potential environmental impacts and recommending appropriate remedial actions.

8 Impact on U. S. Labor

No U.S. jobs will be relocated as a result of USTDA providing any financial assistance to Ghana and Nigeria for the projects recommended in this DM. In fact, as the projects funded by USTDA come to fruition, they will require potential imports of a wide variety of transmission and distribution smart systems, technology and equipment, most of which are manufactured by U.S. firms in facilities located in the U.S. Therefore, with this increase in demand for U.S. exports, this project is expected to have a net positive impact on U.S. employment. Also, no relocation of U.S. jobs is expected as a result of USTDA providing funding for the projects. Thus, the recommended projects will not displace any U.S. jobs.

9 Qualifications

{Redacted}

10 Justification and Recommendation

10.1 Recommendations

CORE International, Inc. is pleased to recommend 4 activities for USTDA's consideration – three in Ghana and one in Nigeria. These activities were selected from a number of projects discussed with potential Grantees during the DM. The evaluation of the projects was conducted in accordance with USTDA's criteria for funding feasibility studies and technical assistance grants.

Exhibit 10 provides a summary of CORE International's recommendations for USTDA's consideration. A brief description of each activity is provided below.

10.2 Justification for the Recommendations

Two of the proposed projects are in the power transmission sector and the other two are in the power distribution sector. The key components and characteristics of these projects are very similar in nature. Therefore, the DM's justifications for recommending these projects are also very similar. The following discussion provides the DM's justification for recommending these four projects for USTDA's funding consideration:

- The proposed feasibility studies and technical assistance do not duplicate any activities currently underway or planned in the near future by any of the key donor agencies and donors — the French Government, the U.K. Government, the World Bank, African Development Bank, and others active in Ghana and Nigeria. In fact, the three activities proposed for Ghana would closely correlate with the MCC's planned Compact for the revitalization of Ghana's power sector. MCC plans to make an investment ranging in \$250-300 million and the proposed projects would advance that investment. The smart grid project feasibility study for Nigeria's transmission grid would foster a number of IPP investments as the current Nigerian grid suffers from a lack of stability and reliability. Any investment aimed at improving the grid would increase the ability of the grid to evacuate additional power reliability with reduced transmission losses.
- The proposed projects would open huge markets for the U. S. smart grid technology and systems suppliers as well as many U.S. engineering firms to manage future projects in Ghana and Nigeria.
- All of the four projects would assist the on-going power sector reform in Ghana and Nigeria and further clarify market rules, especially in the areas of grid code, grid quality, quality of supply and service standards in power distribution, and rules for encouraging IPPs in the two power markets.

-
- With increased opportunities for U.S. exports over time, the net impact on U.S. employment will be positive, as most of the equipment required for the projects to be implemented subsequently is manufactured in plants located within the United States.
 - Power transmission and distribution projects have very limited environmental impacts.

Exhibit 10: CORE International's Recommendations Summary

PROPOSED ACTIVITY	PROPOSED GRANT AMOUNT	PROPOSED GRANTEE
POWER SECTOR PROJECTS RECOMMENDED IN GHANA		
1	Project 1: Feasibility Study of Distribution Automation, Business Process Reengineering, and Capacity Building in Power Distribution for the Electricity Company of Ghana	<p style="text-align: center;">\$645,700.00</p> <p>“Grantee”: Electricity Company of Ghana</p>

- All four projects would result in both improved power distribution and new power Tx and Dx projects. Accordingly, they would directly support the governments’ commitment to increasing access of reliable and affordable electricity to consumers through Ghana and Nigeria. Availability of reliable and affordable power would directly result in economic and development benefits in terms of increase economic activity, income generation, employment creation, and human and institutional capacity building in the power sectors in Ghana and Nigeria.

11 Detailed Terms of Reference for the Recommended Activities

{Redacted}

12 Detailed Budgets for the Recommended Activities

Annex 3 includes detailed budgets for the four activities recommend as part of this DM in USTDA format.

Annex 1: List of Contacts

{Redacted}

Annex 2: Terms of Reference for the Recommended Activities

{Redacted}

PROJECT 1: FEASIBILITY STUDY OF DISTRIBUTION AUTOMATION, BUSINESS PROCESS REENGINEERING, AND CAPACITY BUILDING FOR THE ELECTRICITY COMPANY OF GHANA

1. Project Background

Electricity Company of Ghana (ECG) is responsible for electricity distribution in the Southern part of Ghana, which also has the greater concentration of customers. Specific areas of service of ECG include Ashanti, Central Ghana, Greater Accra, and Eastern and Volta Regions of the country.

As a result of restructuring and unbundling of the power sector in Ghana, ECG now buys electricity from the national transmission company (GRIDCo) and distributes it to its service area. The customers in the Northern part of the country are served by the Northern Electricity Distribution Company (NEDCo), which has been recently established as a company. Currently, NEDCo operates as a subsidiary of Volta River Authority (VRA). However, the plans are for NEDCo to become fully financially and operationally independent of VRA. ECG has grown and transformed to a more effective distributor largely as a result of foreign technical and financial assistance, which has enabled the firm to invest in various areas to improve the quality of the network. ECG has focused on building several distribution lines and the installation of prepaid metering. The company is also focusing on becoming a regional power trader to grow the company.

Given the continuous increase in demand as well as the need for increasing access of electricity to peri-urban and rural areas, ECG, in 2009, announced a number of projects to improve services, combat unplanned outages, and increase electricity access. Specifically, the ECG is currently implementing the following key projects:

- At Accra East, the company plans to create a new feeder from the Legon substation to link at Trinity College. This, according to ECG, is to create flexibility and redundancies in the power supply arrangements to customers around East Legon, Nmai Djorn, Mpeasem and surrounding areas.
- The company also plans to undertake similar projects in other parts of Accra East to enable its customers at GIMPA, Teshie, Burma Camp, Spintex Road and Kisseman Junction among others to enjoy uninterrupted power supply.
- The projects in Accra West include upgrading of weak and multi-jointed cables from industrial area substation to D121 feeder to improve supply reliability to customers around North Kaneshie and industrial area. The Dansoman substation would also be upgraded to improve supply reliability to customers around Bubuashie, Dansoman, Gbegbese, Glepe and its surrounding areas.
- ECG also intends to create two new feeders from Nsawam to create flexibility and redundancies in power supply arrangements to customers at Adeiso and Dorkorchiwa.
- In Ashanti West and East ECG will create additional feeders, replace weak and undersized paper insulated cables and interconnect Ejisu and Effiduase feeders to improve power supply reliability in the area. In the Western Region the company will upgrade conductors on the Agona-Kadadwen 33 kV HT line, re-insulate the CO8 feeder and replace strain insulators on circuit 4 to prevent breakdown.
- Projects to be undertaken in the Volta Region include replacement of HV woodpole on the Amedzofe 33 kV feeder with steel pylons to prevent the incidence of damage of wood poles by bush fires.

Many of these projects have been completed and others are currently underway.

In order to facilitate the reform and unbundling in the power sector, the Government of Ghana, in partnership with the World Bank began the implementation of the Ghana Energy Development and Access Project (GEDAP). GEDAP's development objective is to improve the reliability of electricity supply and increase the population's access to electricity. The project has four components: sector and institutional development; transmission improvement; distribution improvement; and access expansion. ECG is responsible for the implementation of the distribution component and the 'Intensification' sub-component of the Access component under the project. GEDAP I was approved by the World Bank in 2007 for a total of \$90 million. In June 2010, the World Bank approved GEDAP II for an additional amount of \$70 million. Discussions are underway for additional funding by the World Bank for GEDAP III. Bulk of the GEDAP is allocated for the transmission and distribution infrastructure projects being implemented by ECG and GRIDCo.

The distribution component will support investments that aim at improving the distribution business of ECG. Specifically, the ECG's goals under this part of the GEDAP are as follows:

- Network upgrade for reliable supply to be measured by better voltage and reduced outage times
- Reduction in distribution losses (both technical and non-technical losses)

-
- Improvement in the commercial performance of the company by cutting costs and increasing revenues through improved collections
 - Improvement in the quality of supply and service and enhanced customer relations management
 - Implementation of targeted capacity building to transform ECG to a modern well-managed distribution company in terms of technical, commercial and personnel systems and capabilities.

Despite the support from the GEDAP and other donor support, the ECG still faces high distribution losses. Currently these losses are comprised of (i) 10.2% in technical losses, (ii) 18% in non-technical losses, and (iii) 13% in collections. Together, these losses amount to 41.2%. The quality of supply and service provided by ECG is also below industry standards; although reliable estimates of quality of supply and service are not difficult to obtain. In addition, the company continues to struggle as it attempts to reengineer its business processes and transform itself to a well-run modern distribution utility.

Although a number of individual projects have been implemented including metering, SCADA in some 11 kV feeders, a CIS system funded under the GEDAP, etc., ECG's goal is to reach almost complete automation in its distribution management and reengineer its business processes through the use of smart grid and smart meter technologies widely practiced by modern utilities.

Adding to these challenges, ECG needs capacity building and employee training and skills upgrades throughout its operations.

In order to address this requirement, ECG, the proposed "Grantee", is in need of services to conduct a technical and financial feasibility study of smart grid applications for distribution loss reduction and business process reengineering coupled with a training needs assessment and training plan. In addition, ECG is in need of targeted training in the most critical areas of its operations. The Government of Ghana has received funding from the U.S. Trade and Development Agency to finance the proposed feasibility study ("The Study") including investment requirements and a financing plan for the project.

2. Purpose and Objective of the Study ("Study")

The vision of Electricity Company of Ghana (ECG), the proposed "Grantee", is to provide world-class service to its customers by employing an integrated and automated distribution system coupled with a full integration of the company's business processes. The integrated system would allow ECG to tie customer data with supply information in real time, resulting in more cost-effective service and quicker responses to network and system problems. In addition, reengineering of its business processes will transition the company to a commercially operated distribution utility. As part of the integration implementation process, certain evaluation studies need to be carried out prior to selection of equipment, software, and service providers. These Terms of Reference (TORs) will provide the "Grantee" the necessary analysis, evaluation, and planning for this transition. In addition, the feasibility study would include the development of key performance indices (KPIs) for ECG consistent with international best practices in power distribution.

The objective of the proposed feasibility study (the “Study”) is to develop the planning and technical design aspects of a high-level distribution systems integration strategy and recommend a system that will address business process planning and decision- making and fully integrate the company’s distribution management. In addition, the study shall include a training needs assessment and a training plan needed for the implementation of distribution automation and business process reengineering. The “Contractor” shall provide the following services:

- Conduct a strategic evaluation and assessment of the suitability of the current technology, software, and distribution management systems deployed at the ECG for operating a modern power distribution utility;
- Assess the gaps and the development of specific distribution IT systems, integration approaches, smart grid technologies, smart metering technologies, and complete systems integration;
- Develop a high level integration plan/strategy to help inter-link ECG’s numerous databases and information systems;
- Identify key performance indicators (KPIs) and targets around key business processes based on the gap analysis and the integration plan developed under the “Study”;
- Conduct a training needs assessment (TNA) of the entire management and operations of the “Grantee” and develop a training implementation plan;
- Provide two one-week training courses to ECG managers and engineers in targeted areas of priority to be selected by the “Contractor” in consultation with the “Grantee”; and
- Develop an implementation and financing plan for the recommended training program, systems, and technologies including an investment program and financing options.

In addition, the “Contractor” shall carry out other tasks as detailed in these TORs.

3. Scope of Work and Specific Tasks

The scope of the “Study” shall include the entire distribution network of the “Grantee” including all business processes: Geographical Information System (GIS), Customer Information System (CIS), SCADA, Outage Management System (OMS), Work Flow Management System (WMS), Asset Management System (AMS), metering billing and collections, communications systems, business planning, regulatory compliance, investment programming, Customer Relations Management (CRM) and other operations.

The “Contractor” shall conduct the following tasks as part of the “Study”:

{Redacted}

Annex 3: Detailed Budget for the Recommended Studies and Budget Notes

Detailed Budget for Project 1:

Exhibit 11 provides a detailed budget for the proposed feasibility study in the format required by USTDA. Exhibit 12, 13, and 14 provide the distribution of the budget by task and proposed experts and a schedule for the study respectively.

Budget Notes

The following budget notes are provided in the format required by USTDA:

Direct Costs

Direct Labor:

All of the proposed experts for the “Study” are senior professionals with graduate degrees and more than 15 years of professional experience in their respective fields. The average base salary rate for professionals with this level of qualification and experience is \$80 per hour. The fringe benefit is assumed to be 40% of the base salary rate. The overhead rate is assumed to be an average of 75% and is applied on the sum of the base salary and fringe. Based on these assumptions, the hourly billing rate of the proposed professionals is calculated as follows:

Hourly Billing Rate = base hourly rate + fringe benefit + {(base hourly rate + fringe) x overhead}

$$= \$80 + \$32 + \{\$112 \times 0.75\}$$

$$= \$112 + 84 = \$196$$

Profit = \$4.00

Hourly Billing Rate with Profit = \$200.00. This rate comes to a daily billing rate of \$1,600.00 for an 8-hour day.

The total number of work days for the experts proposed as part of the budget are estimated based on the level of effort needed to complete their respective assignments. These estimates are as follows:

- Project Manager/Power Distribution Expert and Training Expert: 85 work days
- Distribution IT and Smart Grid/Smart Meter Expert: 80 work days
- Economic and Financial Analysis Expert: 60 work days
- Development Impact Expert/Environmental Expert: 22 work days
- A Pool of Distribution Systems/Capacity Building and IT Experts: 88

In addition, a total of 65 work days are estimated for local Ghanaian experts who would work with the U.S. team and support most of the tasks. The total daily rate for these experts

including the “Contractor’s” administrative costs and fees is estimated at \$500 per day based on the prevailing rate of Ghanaian Experts for similar assignments.

Other Direct Labor:

No independent consultants are proposed.

Other Direct Costs

Purchased Services/Contracts

No purchased services are anticipated.

International Travel

All of the proposed experts will travel to Ghana at various times as indicated in the Terms of Reference. Specifically the following international trips are planned for the completion of all work required under the “Study”:

Project Kick-off Trip (3 Person Trips)

Project Manager, and two other experts will travel to Ghana for three weeks to develop the work plan, meet with key government, regulatory, and utility officials and collect relevant data.

- Three Person Trips from the U.S. to Ghana @ \$2,800 refundable economy class airfare amounting to a total of \$8,400.00 (Task 1).

Two Data Gathering and Site Visit Trips (4 Person Trips)

- The Project Manager, and three other experts would need to travel to Ghana for three weeks to collect additional data. This would require 4 trips at an average airfare of \$2,800.00 for the trip (Task 2). The total comes to \$11,200.00

First Presentation Trip (1 Person Trip)

- At a time to be agreed to with the “Grantee”, the Project Manager will travel to Ghana for one week to make an interim presentation. This would add \$2,800.00 to the cost of international travel.

Second Presentation Trip (2 Person Trips)

- At a time to be agreed to with the “Grantee”, the Project Manager and one other team member will travel to Ghana for two weeks to make an interim presentation. This would add \$5,600.00 to the cost of international travel.

This allows for a total of 10 international trips.

Domestic Travel to various Sites

Various members of the team will visit a number of distribution sites. The precise locations of the sites will be determined in discussions with key officials in Ghana. We have allowed for a

total of \$3,000.00 for visits to at least 10 sites by two people. Some of the sites will be accessible through driving and air travel may be needed in a few sites.

Other Expenses

The following other expenses are estimated for the completion of the proposed “Study”:

Reproduction of the Final Report

Reproduction costs are estimated based on 10 separate deliverables including the final report and appropriate number of copies. A total of 10,000 pages are estimated at a cost of \$0.25 per page. The total cost comes to \$2,500.00.

Courier Services

Five large courier packages containing key deliverables and the final report will be shipped from the U.S. to Accra, Ghana. This cost is estimated based on quotes from Fedex at \$120.00 per shipment, amounting a total cost of \$720.00

Visa

Visa costs are estimated at \$100 per visa for 5 visas, amounting to a total of \$500.00

Communications

Communications costs are estimated at the rate of \$125.00 per month for 8 months, amounting to a total cost of \$1,000.00.

Exhibit 12: Distribution of Labor Among Various Tasks

PROJECT 1: FEASIBILITY STUDY OF DISTRIBUTION AUTOMATION, BUSINESS PROCESS REENGINEERING AND CAPACITY BUILDING FOR THE ELECTRICITY COMPANY OF GHANA

TOTAL LABOR PART OF THE BUDGET FOR THE STUDY	100%	\$539,200.00
Task	Percent of Labor Budget	Amount
Task 1: Technical Assessment: Conduct a Review of the Existing System and Training Needs, Develop a Work Plan, and Submit Inception Report	16.3%	\$88,000.00
Task 2: Technical Assessment: Conduct a Technical Analysis and Identify Gaps and Requirements	28.2%	\$152,000.00
Task 3: Develop Cost Estimates and Investment Needed for the Identified System Requirements to Meet the Gaps	15.8%	\$80,000.00
Task 4: Conduct an Economic and Financial Analysis of Recommended Investments in Capacity Building and Smart Grid Applications	5.9%	\$32,000.00
Task 5: Develop a Blue Print for Financing the Investments Needed in Phase I and Phase II	7.4%	\$40,000.00
Task 6: Conduct a Review of Regulatory Issues Related to the Project	4.5%	\$24,000.00
Task 7: Conduct an Appropriate Environmental and Social Impact Analysis of the Project	4.5%	\$24,000.00
Task 8: Conduct an Analysis of the Key Host Country Development Impacts	3.6%	\$19,200.00
Task 9: Develop a Five-Year Project Implementation Plan and Budget	7.4%	\$40,000.00
Task 10: Conduct an Assessment of U.S. Sources of Supply	1.5%	\$8,000.00
Task 11: Final Report	5.9%	\$32,000.00
TOTAL EXPAT LABOR BUDGET	100%	\$539,200.00

Exhibit 13: Distribution of Labor Days Among Various Tasks and Experts

PROJECT 1: FEASIBILITY STUDY OF DISTRIBUTION AUTOMATION, BUSINESS PROCESS REENGINEERING AND CAPACITY BUILDING FOR THE ELECTRICITY COMPANY OF GHANA

	PROPOSED EXPERTS	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7	TASK 8	TASK 9	TASK 10	TASK 11	TOTAL DAYS
1.	Project Manager/Power Distribution Expert and Training Expert	20	25	10	0	5	5	5	2	5	5	5	85
2.	Distribution IT and Smart Grid/Smart Meter Expert	20	30	15	0	0	5	0	0	5	0	5	80
3.	Economist/Financial Analyst	0	0	5	20	20	5	0	0	5	0	5	60
4.	Development Impact Expert/Environmental Expert	0	0	0	0	0	0	10	10	0	0	2	22
5.	Pool of Distribution Systems, Capacity Building, and IT Experts	15	40	20	0	0	0	0	0	10	0	3	88
	TOTAL DAYS	55	95	50	20	25	15	15	12	25	5	20	337

Exhibit 14: Proposed Schedule

PROJECT 1: FEASIBILITY STUDY OF DISTRIBUTION AUTOMATION, BUSINESS PROCESS REENGINEERING AND CAPACITY BUILDING FOR THE ELECTRICITY COMPANY OF GHANA

	TASKS									
		1	2	3	4	5	6	7	8	
1.	Task 1: Technical Assessment: Conduct a Review of the Existing System and Training Needs, Develop a Work Plan, and Submit Inception Report	████████████████████								
2.	Task 2: Technical Assessment: Conduct a Technical Analysis and Identify Gaps and Requirements	████████████████████								
3.	Task 3: Develop Cost Estimates and Investment Needed for the Identified System Requirements to Meet the Gaps			████████████████████						
4.	Task 4: Conduct an Economic and Financial Analysis of Recommended Investments in Capacity Building and Smart Grid Applications				████████████████████					
5.	Task 5: Develop a Blue Print for financing the Investments Needed in Phase I and Phase II				████████████████████					
6.	Task 6: Conduct a Review of Regulatory Issues Related to the Project				████████████████████					
7.	Task 7: Conduct an Appropriate Environmental and Social Impact Analysis of the Project					████████████████████				
8.	Task 8: Conduct an Analysis of the Key Host Country Development Impacts					████████████████████				
9.	Task 9: Develop a Five-Year Project Implementation Plan and Budget					████████████████████				
10.	Task 10: Conduct an Assessment of U.S. Sources of Supply					████████████████████				
11.	Task 11: Final Report				████████████████████					

ANNEX 3



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

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

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

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

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

NATIONALITY:

1) Rule

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

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

2) Application

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

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

3) Definitions

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

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

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

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

SOURCE AND ORIGIN:

1) Rule

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

2) Application

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

3) Definitions

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

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

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

ANNEX 4



GRANT AGREEMENT

This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA"), and the Electricity Company of Ghana Limited ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Grant Agreement US\$646,000 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed ECG Smart Grid Applications ("Project") in the Republic of Ghana ("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. In the event that only one signature is dated, such date shall constitute the Effective Date.

8. Study Schedule

(A) Study Completion Date

The completion date for the Study, which is January 1, 2014, 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 Director of Engineering. 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: Electricity Company of Ghana Limited
Electro-Volta House
P.O. Box GP 521
Accra, Ghana

Phone: (233) 302 676719
Fax: (233) 302 676718
E-Mail: d.eng@ecggh.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
Africa@ustda.gov

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

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

Appropriation No.: 11 13/14 1001
Activity No.: 2013-11002A
Reservation No.: 2013045
Grant No.: GH201311045

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.

22. Governing Law

This Grant Agreement shall be governed by, and construed in accordance with, the applicable laws of the United States of America. In the absence of federal law, the laws of the State of New York shall apply.

23. Counterparts

This Grant Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same agreement. Counterparts may be delivered via electronic mail or other transmission method and any counterpart so delivered shall be deemed to be valid and effective for all purposes.

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the Government of the United States of America and the Electricity Company of Ghana 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

For the
Electricity Company of Ghana Limited

By: Paul A. Mani

By: [Signature]



Date: 06 DEB 2012

Date: 06/12/2012

Witnessed:

Witnessed:

By: [Signature]

By: [Signature]

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

Annex I

Terms of Reference

The purpose of this Study is to develop the planning and technical design aspects of a high-level distribution systems integration strategy, recommend a system that shall address business process planning and decision-making, and fully integrate the Grantee's distribution management systems. In addition, the Study shall include a training needs assessment and a training plan needed for the implementation of distribution automation and business process reengineering.

The scope of the Study shall include the entire distribution network of the Grantee including all business processes: Geographical Information System (GIS), Customer Information System (CIS), Supervisory Control And Data Acquisition (SCADA), Outage Management System (OMS), Work Flow Management System (WMS), Asset Management System (AMS), metering billing and collections, communications systems, business planning, regulatory compliance, investment programming, Customer Relations Management (CRM) and other operations. The Study shall focus both on distribution automation and business process reengineering.

The Contractor shall perform the following Tasks:

Task 1: Technical Assessment: Conduct a Review of the Existing Power Distribution System and Training Needs, Develop a Work Plan, and Submit Inception Report

Subtask 1.1: Conduct a Kick-Off Meeting: The Contractor shall organize a kick-off meeting with the Grantee and other relevant stakeholders. The Grantee shall coordinate with the Contractor to identify appropriate personnel and other relevant stakeholders to participate in the kick-off meeting. During the kick-off meeting, the Contractor shall introduce the Contractor's Study team; review the tasks to be performed under these Terms of Reference; review the Work Plan; and gather input from the Grantee regarding the Grantee's goals for the Study, salient issues surrounding the Grantee's plans for the Project, and the Grantee's requests for changes in the Work Plan, if any.

For the kick-off meeting, the Contractor shall coordinate with the Grantee to select appropriate meeting content; prepare an agenda, handouts, and presentation materials, as needed, for all meeting attendees; conduct the meeting and facilitate discussion; draft a report of the meeting and distribute the meeting report to meeting attendees and other relevant stakeholders as identified by the Grantee; and maintain meeting records, including the agenda, any handouts and presentation materials, a list of all meeting participants, and the meeting report.

Subtask 1.2: Conduct a Thorough Review of Available Documents, Information, Laws, and Regulations to Define the Context of the Study: At the start of the Study and following the project kick-off meeting, the Contractor shall conduct a thorough review of the following:

- Available forecasts for electricity demand in the Grantee's service area and Grantee's plans to meet the demand;
- The Grantee's current and projected electricity purchase and electricity sales tariffs;
- Current laws, regulations, standards, and institutions that would impact project implementation – rural and peri-urban connections rules, quality of supply and service standards issued by the Energy Commission of Ghana (the technical regulator), performance benchmarks, licensing, and tariff filing regulation issued by the Public Utility Regulatory Commission (PURC – the economic regulator);
- Existing studies, analyses, implementation plans, and other available information relevant to the Study (the Grantee's priorities, business plan, etc.);
- Currently planned investment projects and discussions with donors; and
- Any current interest from the private sector in various aspects of the Grantee's distribution business.

Subtask 1.3: Review Current Distribution System Management Practices and IT Applications: The Contractor shall visit the Grantee for a field mission and discussions, as well as to conduct an initial review of the Grantee's existing processes and systems. The Contractor's review shall include the Grantee's following systems and processes, as well as overall operations:

- GIS Planning and Design
- Enterprise Resource Program (ERP)
- CIS
- OMS
- AMS
- Metering, Billing, and Collections
- CRM and Customer Database
- SCADA Transmission/Distribution Management and AutoCad for Design of SCADA Data
- Mobile Communications Inter-link needed for a two-way communications between the control center and work crew (a common practice in utilities for work flow management)
- Business Case Analysis – Financial Management, Investment Planning, Regulatory Compliance, Human Resource Management, and Related Business Processes
- Power System Analysis Tool (PSAT) for power flow analyses needed to ensure that the distribution lines and substations operate smoothly without being stressed and risking failure
- Communications System for Distribution Automation
- Vehicle Monitoring to monitor vehicle movements
- Automated Meter Reading (AMR) Systems and Smart Meter Systems
- Problems faced by the Grantee and the other Study stakeholders with the implementation of pre-paid meters
- Other areas as identified by the Grantee

In addition, the Contractor shall review the following operations:

- The Contractor shall meet with the transmission staff of the Ghana Grid Company Limited (“GRIDCo”), Ghana’s national electricity transmission company, to better understand how the Grantee interacts with GRIDCo at the transmission level. The Contractor shall also assess the future needs and integration requirements that will allow for better management of the Grantee’s distribution system and link to the national transmission system. Specifically, the Contractor shall review the Grantee’s procedures, systems, and operations records to assess the transmission/distribution interface between GRIDCo and the Grantee.
- The Contractor shall also meet with the Energy Commission of Ghana to ensure that any technology recommendations resulting from the Study are consistent with the technical regulations and requirements of the Commission.

The Contractor shall review Ghana’s currently available distribution operation and management data (power flows, voltages, outages, customer complaints, connections procedures, etc.) and assess future needs under an integrated distribution system. The Contractor shall review all databases and data collection systems currently in use at the Grantee’s facility and identify any redundant processes and means for improving data quality and availability to facilitate timely management decisions.

Subtask 1.4: Conduct a Training Needs Assessment: The Contractor shall conduct a training needs assessment (TNA) that would assess and document the training and capacity building needs at all levels of the Grantee’s operations, including upper management, linemen, and customer service personnel. In addition, the TNA shall focus on all business processes including the current human resource management at the Grantee’s facilities and document the full range of training and capacity building requirements in various functional areas of the Grantee’s operations. Based on this assessment the Contractor shall develop specific recommendations for the type of training needed to improve the Grantee’s management and operations. The list of training activities documented by the Contractor shall include training activities that could be continued by the Grantee beyond this Study and the specific training to be provided as part of this Study under Task 2.

Subtask 1.5: Develop and Finalize the Inception Report and Work Plan: As part of this subtask and based on the previous subtasks, the Contractor shall develop an Inception Report for completing the Terms of Reference, incorporate any comments from the Grantee, and finalize the Work Plan. Specifically, the Inception Report shall include, any clarifications agreed to during the meetings, a list of the sites visited and key findings, a list of meetings held and summary of discussions, a detailed schedule of activities under the remainder of the Study, a list of data requirements, and a finalized Work Plan including proposed field trips under the various tasks. This Work Plan shall be the guiding document for the completion of the TA and submission of all deliverables.

Task 1 Deliverable: The Contractor shall prepare a report including all work performed under Task 1. The Task 1 Deliverable shall be included in the Final Report.

Task 2: Technical Assessment: Conduct a Technical Analysis and Identify Gaps and Requirements

Subtask 2.1: Conduct a Technical Analysis of the Existing Power Distribution System: The Contractor shall closely work with the Grantee's engineers and managers to conduct a detailed technical analysis of the distribution systems and business processes including the review of documents, technical specifications, records, and visits to at least fifteen (15) sites, such as the various control centers and substations to be selected in consultation with the Grantee. The Contractor's technical analysis shall also include a documentation of current performance on relevant performance indicators, training requirements, and system requirements for moving forward with the Grantee's plans to implement an integrated and automated distribution system and capacity building for its workforce. The Contractor shall document areas where training would be required for the Grantee's managers and engineers and develop at least ten (10) course curricula for one-day, three-day, and five-day training programs. The training from this subtask is independent of the training outlined in subtask 2.4.

Subtask 2.2: Conduct a Gap Analysis: Building on the work conducted under Task 1 and Subtask 2.1, the Contractor shall define and describe the gaps in the Grantee's current distribution management systems, including human resources management and training. These gaps shall include all factors and issues that stand between the present state of the Grantee's distribution system and a technologically mature distribution operating company employing state-of-the-art information technology (IT) systems and smart grid distribution system solutions. The factors and issues that the Contractor shall cover in the gap analysis shall include, but not be limited to, the following:

- An evaluation of the interdependence of each system and ways to increase efficient information flow for different distribution operations;
- Presentation of current operational process and work flows;
- Gaps assessment in all technical and IT systems;
- Gaps in meeting quality of supply and service standards, performance standards, SCADA, outage management, and overall customer service;
- A review and evaluation of current human resources to determine future human resource needs; and
- Provide transfer of knowledge/information to the Grantee regarding best practices and lessons learned regarding the application of smart grid solutions for electricity distribution networks in other developed and developing countries.

Based on the activities conducted above, the Contractor shall prepare a gap analysis for each of the distribution processes and distribution management practices at the Grantee's facilities. The Contractor shall also compile quantitative data and potential key performance indicators (KPIs) to document the Grantee's current performance in key

performance areas under review. The Contractor shall also identify any significant data gaps or concerns with data quality.

Subtask 2.3: Develop Recommendations to Address the Identified System Gaps: Based on the results of Subtask 2.2, the Contractor shall develop a set of detailed written recommendations for the Grantee which adhere to industry proven practices that would enhance the Grantee's distribution system management, customer service, regulatory compliance, system maintenance, and investment programming. The Contractor shall identify and propose annual targets for key performance metrics in order to ensure accountability for results and objective monitoring of performance improvements resulting from the recommended actions.

The Contractor shall also develop detailed performance-based specifications for the recommended investments and practices that fill the identified system gaps and facilitate full Project implementation, including, at a minimum, the following:

- AMR systems;
- Accuracy and timeliness of data collection;
- Ability to collect data for introduction of various advanced tariffs, such as time-of-use and interruptible tariffs;
- Integration of smart meters into the Grantee's existing and planned electricity distribution and customer information systems;
- Active and reactive energy control and distribution loss reduction;
- Protection and control systems with automatic system reconfiguration in response to faults;
- Distribution transformer monitoring;
- Automated line devices and switches;
- Reactive power control systems;
- Combating electricity theft;
- Customer load control;
- Customer-side electrical safety, such as overload protection, overheating, and electrical shock;
- Customer options, including electricity budgeting; and
- Energy efficiency measures.

The specifications shall comply with Host Country standards for distribution management and operations requirements.

In developing the IT systems and smart grid requirements to address the gaps, the Contractor shall review the current and planned regulatory standards requirements and statutes put forth by the Energy Commission of Ghana and ensure that any plans for integration comply with these requirements and statutes. Specifically, the Contractor shall ensure that the systems and technologies recommended for the Grantee meet the following criteria and requirements, among others, as identified by the Grantee and Contractor:

- All technical (including system interface and information exchange) requirements for integrating the Project into the Grantee's existing and planned electricity distribution and customer information systems;
- Step-by-step recommendations for carrying out the integration strategy;
- Cost estimates for implementing the integration strategy, including costs of required upgrades to existing systems;
- Clear descriptions of the changes that would occur in the Grantee's electricity distribution network as a result of the integration strategy; and
- Justifications for the investment requirements of the integration strategy based on a cost-benefit analysis.

The requirements developed by the Contractor shall take into account the emerging technologies and smart grid solutions for distribution systems that impact all regulatory reliability and operational initiatives.

Subtask 2.4: Provide Training to the Grantee's Managers and Technical Personnel:

Based on subtasks 2.1 – 2.3, the Contractor, in consultation with the Grantee, shall select two high priority capacity building and training subjects from the TNA developed under Task 1. The Contractor shall develop and deliver two one-week training programs to Grantee personnel in these two priority areas selected by the Grantee. Potential areas of training may include methods to mitigate high distribution losses and poor collections. The training program shall include the following:

- A detailed definition of the subject areas and training contents;
- A detailed training book with a day-by-day agenda for in-class course delivery;
- Lab exercises and site visits developed in consultation with the Grantee to integrate field work with in-class training;
- At least two case studies of two utilities in the United States, to demonstrate the applicability of the recommended technologies and systems to the Grantee's distribution operations;
- Frequent question and answer (Q&A) sessions to ensure comprehension of the subject matter by the participants; and
- A training course evaluation survey at the end of the five-day course.

In addition to the two five-day courses, the Contractor shall provide on-the-job training to the Grantee's managers and engineers during all field missions by working side-by-side with them and involving them in all site visits and simulation exercises. This on-the-job training shall include work sessions with the Grantee personnel on the specific analyses included in the remainder of the tasks in the Study.

Task 2 Deliverable: The Contractor shall prepare a report including all work performed under Task 2. The Task 2 Deliverable shall be included in the Final Report.

Task 3: Develop Cost Estimates and Investment Needed for the Identified System Requirements to Meet the Gaps

Based on the system requirements developed under Task 2 to address the gaps in the Grantee's distribution system and management practices, the Contractor shall develop detailed cost estimates for the implementation of the training plan, various equipment, hardware, software, licenses, and training needed for the next stage program implementation. The cost estimates shall be based on industry quotes for the various items as well as all material and installation costs based on prevailing local costs in Ghana. The Contractor shall closely work with the Grantee in developing the cost estimates.

Based on the cost estimates, the Contractor shall develop an investment program for the Grantee, including capital costs, equipment costs, licensing fees, system operations and maintenance costs, and any costs associated with staff and engineer training in order to implement the recommended solutions. The Contractor shall perform a life cycle cost analysis of the proposed equipment and systems for the Project when developing the investment program.

In consultation with the Grantee, the Contractor shall organize the investment program into two phases. Phase I shall focus on the highest priority investments (the first two-to-three years of implementation) and Phase II shall include medium- to long-term investment requirements. The Contractor shall structure this approach in a way to assist the Grantee in its internal budgeting process and in seeking financing from the Millennium Challenge Corporation (MCC), the World Bank, the African Development Bank, and any other relevant investors as determined by the Contractor and Grantee for the Project.

In developing the cost estimates for various systems, technology, and components, the Contractor shall deploy state-of-the-art systems for, but not limited to, the following:

- CIS
- GIS
- PSAT
- OMS – including devices and sensors required to effectively monitor and control outages in addition to the central management system
- AMS
- WMS
- CRM
- Distribution IT Integration Systems and Bus Bars

The investment program shall also identify KPIs, their baselines, and propose annual targets that align with the gap analysis and recommendations. If there are data gaps or significant problems with data quality, the Contractor shall develop recommendations on ways to improve data quality and availability and cost them out in the investment

program in order to ensure accountability for results and objective monitoring of performance.

Task 3 Deliverable: The Contractor shall prepare a report including all work performed under Task 3. The Task 3 Deliverable shall be included in the Final Report.

Task 4: Conduct an Economic and Financial Analysis of Recommended Investments in Capacity Building and Smart Grid Applications

Based on the total investment requirements for Phase I and Phase II and life cycle cost analysis of equipment and systems, the Contractor shall conduct detailed economic and financial analyses of the proposed investments using an internationally acceptable methodology for such analyses. The Contractor's financial analyses of the Project shall be based on a standard methodology used by donors, such as MCC, the World Bank, the African Development Bank, and any other relevant investors as determined by the Contractor and Grantee for appraising investment projects. The Contractor shall consult with potential donors when developing the analysis. The Contractor shall calculate both the economic and financial internal rates of return for the recommended investments under a variety of different assumptions such as different interest rates, depreciation, licensing fees, import duties, etc.

In addition, the Contractor shall conduct a sensitivity analysis of the return on investment for two-to-three practical financial packages for financing the investments. The Contractor's sensitivity analysis shall account for the cost recovery indicators based on different assumptions for key project variables, such as electricity tariffs, sales volumes, capital and operating cost estimates, and interest rates and investment requirements.

As the first step under this task, the Contractor shall acquire and compile historical and projected energy and capacity information in Ghana for use in assessing the market for the Project. In addition to the capital costs, the Contractor shall provide an estimate of projected operating expenses, including a detailed breakdown of the general, administrative, operating, and maintenance costs for the Project. As part of the financial and economic analysis, the Contractor shall take into consideration the escalation of the costs over a two (2) to five (5) year period.

The Contractor shall estimate the projected savings of the Project. In addition, the Contractor shall develop a cash balance *pro forma* that presents the net cash savings from the proposed investments determined by netting revenue against costs.

The Contractor shall prepare a financial analysis and model of the project, considering alternative methods and sources of financing, including grants and concessionary financing, and debt. The financial model shall be a tool for defining the terms and conditions of the financing structure and testing the volatility of the Project's ability to service its debt.

Following discussions with the Grantee, the Contractor shall select an “optimum,” “minimum,” and “most likely” economic/financial scenario for which to develop financial documentation that may be used by the Grantee for presentation to its financial officials. The Contractor shall also rank the investments in terms of their financial viability and likely investor interest. This Contractor shall include this documentation in the Final Report.

The Contractor shall also provide a working seminar to the Grantee’s economists and financial analysts as selected by the Grantee and train them on the use of the model developed under this task. The Contractor shall deliver the economic/financial model to the Grantee and install it on the Grantee’s computers for use by the Grantee’s personnel.

Task 4 Deliverable: The Contractor shall prepare a report including all work performed under Task 4. The Task 4 Deliverable shall be included in the Final Report.

Task 5: Develop a Blue Print for Financing the Investments Needed in Phase I and Phase II

The Contractor shall develop two options for financing the projects – one for Phase I and the other for Phase II investments. The Contractor shall identify project risk factors and develop a risk avoidance/reduction plan for each factor by means of insurance and bonding or other means, adequate to the requirements of the funding sources, including host country sources, multilateral financiers, and others.

Specifically, the Contractor shall identify and analyze the following potential sources for financing the Project in both Phase I and Phase II:

- Internal funds from the Grantee’s resources or the Government of Ghana’s budget
- Combination of internal budget funds and development financing from international financial institutions
- Combination of the above and export credit financing from the U.S. Export-Import Bank
- Blended financing from debt and equity from a variety of donors
- Potential grant funding from MCC and other U.S. government donor agencies

Task 5 Deliverable: The Contractor shall prepare a report including all work performed under Task 5. The Task 5 Deliverable shall be included in the Final Report.

Task 6: Conduct a Review of Regulatory Issues Related to the Project

The Contractor shall conduct an analysis of the anticipated Ghanaian laws, standards, and institutions, which could impact the Project’s implementation. In addition, the Contractor shall identify and assess any regulatory barriers that may impede the development,

financing, and implementation of the Project in the Grantee's distribution operations in Ghana.

Specifically, the Contractor shall analyze all regulatory issues that could impact the implementation of the proposed technologies and systems for distribution automation and business process reengineering at the Grantee. The Contractor's analysis shall include all pertinent documents that deal with import taxes, duties and fees, corporate and personal income taxes, and property and other taxes related to the implementation of the Project. The Contractor's analysis shall also include all permitting requirements, foreign participation regulations, regulations that impact environmental requirements, and any other regulatory issues that will have a significant impact on the Project, as well as reporting on the quality of service and supply standards required by the regulators.

The Contractor shall recommend remedial actions to mitigate any regulatory barriers. In addition, the Contractor shall recommend actions to comply with all regulatory requirements.

The Contractor shall deliver a stand-alone report to the Grantee on the regulatory assessment related to implementing the Project both in the immediate time frame (Phase I) and in the medium- to long-term (Phase II). The Contractor shall share these findings of this task with all relevant Ghanaian stakeholders including the Energy Commission of Ghana and Ghana's Northern Electricity Distribution Company (NEDCo).

Task 6 Deliverable: The Contractor shall prepare a report including all work performed under Task 6. The Task 6 Deliverable shall be included in the Final Report.

Task 7: Conduct Preliminary Environmental and Social Impact Assessments

The Contractor shall evaluate and report on the expected environmental impacts of the proposed project with reference to local, national and international laws and regulations, including those of international finance institutions, such as the World Bank, the African Development Bank, the International Finance Corporation (IFC), MCC (MCC uses the same standards as the IFC) and private banks. Some of the Contractor's analysis shall be a part of Task 1 and Task 2, so that any cost impacts can be captured for the economic and financial analysis.

The Contractor's review shall identify potential negative impacts, discuss the extent to which they can be mitigated, and develop plans for a full environmental impact assessment if and when the project moves forward to the implementation stage. The Contractor's assessment shall include the identification of the steps that the Grantee will need to undertake subsequent to the Study's completion and prior to Project implementation.

In addition, the Contractor shall conduct an analysis of the likely social impacts of the proposed distribution projects. Specifically, the Contractor shall estimate the following types of impacts:

- Impact on social changes as a result of electricity access such as rural-urban trade and integration, impact on the quality of education and health services, etc.
- Impact on any local economic activity such as the creation of local small businesses and income generation
- Any other impacts in social behavior and social discourse

Task 7 Deliverable: The Contractor shall prepare a report including all work performed under Task 7. The Task 7 Deliverable shall be included in the Final Report.

Task 8: Conduct an Analysis of the Key Host Country Development Impacts

The Contractor shall conduct a development impact assessment of the Project. The purpose of the development impact assessment is to provide the Project's decision makers and interested parties with a broader view of the Project's potential effects on Ghana. The Contractor's analysis shall focus on what development impact is likely if the project is implemented according to the Study's recommendations. While specific focus shall be paid to the immediate impact of the Project, the Contractor's analysis shall include any additional development benefits that may result from the Project's implementation, including spin-off and demonstration effects. The Contractor's development impact assessment shall identify the anticipated impacts of the Project in the following categories:

- **Infrastructure:** The Contractor shall identify the anticipated infrastructure impacts of the Project, giving a brief synopsis and concrete examples of infrastructure impacts. Examples of infrastructure impacts related to implementation of the Project may include the installation of smart meters, as well as associated communication infrastructure and other related hardware and software systems. The Contractor shall provide specific information about the anticipated infrastructure impacts of the Project, such as the anticipated number smart grid technology to be installed, details regarding anticipated improvements in the Grantee's communication infrastructure and other related hardware and software systems, and the impact of the Project on the Grantee's existing and planned electricity distribution and customer information systems.
- **Human Capacity Building:** The Contractor shall identify the anticipated number and types of local jobs that would be created or retained as a result of the Project. The Contractor shall also identify the number of local people who would receive training and the types of training programs required to implement and sustain the Project. The Contractor shall not include training performed under these Terms of Reference in the development impact assessment.

- Technology Transfer and Productivity Enhancement: The Contractor shall identify the anticipated advanced technologies that would be utilized for the Project. The Contractor shall also identify anticipated efficiencies that would be gained as a result of the Project. Examples of efficiencies related to implementation of the Project may include higher output per resource use, lower costs, or other common measures of efficiency used in the electricity distribution industry.
- Market Oriented Reforms: The Contractor shall provide a description of any regulations, laws, standards, or institutional changes that are recommended pursuant to these Terms Of Reference and the effect they would have if implemented.
- Other: The Contractor shall identify any other anticipated development impacts or benefits that would result from the Project, such as improved financial revenue flows to the Grantee and other stakeholders, improvements in Ghana's energy security, reduced emissions of greenhouse gases and other harmful pollutants, positive spin-off effects on other economic sectors, etc.

The Contractor shall develop a methodology for assessing these impacts over time, and shall identify where to obtain this information in the future.

Task 8 Deliverable: The Contractor shall prepare a report including all work performed under Task 8. The Task 8 Deliverable shall be included in the Final Report.

Task 9: Develop a Five-Year Project Implementation Plan and Budget

Based on the activities conducted under Tasks 1 through 8, and specifically the gaps identified in the Grantee's distribution system and management practices, the Contractor shall develop a detailed five-year implementation plan and budget (Implementation Plan) for the Project based on the final agreed-upon capacity building and training requirements, IT systems and smart grid systems as recommended by the Contractor and adopted by the Grantee. The Contractor's Implementation Plan shall provide the Grantee with a detailed description of the gaps and the options to mitigate each of them, coupled with a cost/benefit breakdown for each option. The Contractor's Implementation Plan shall also identify KPIs, their baselines, and propose annual targets that align with regulatory and business plan targets. If there are data gaps or significant problems with data quality, the Contractor shall identify recommendations on how to improve data quality and availability in order to ensure accountability for results and objective monitoring of performance at the Grantee.

The Contractor shall make a clear distinction for the high priority investments planned during Phase I (the first two-to-three years following the Study's completion) and Phase II (medium- to long-term).

The Contractor shall provided the Grantee with the following items which are relevant to the Implementation Plan:

- A recommended schedule for Project implementation, including recommendations for phasing, milestones, and prioritization of investments
- An outline of all the steps the Grantee will need to take subsequent to the Study's completion and prior to project implementation, such as:
 - Environmental and social impact assessments that comply with local environmental and social requirements and those of multilateral lending agencies such as MCC, the World Bank and the African Development Bank;
 - Licensing, permitting, and other relevant legal and regulatory requirements;
 - Financial arrangements;
 - Procurements of goods and services;
 - Systems integration;
 - Operations and maintenance; and
 - Short- and long-term training requirements.
- An assessment of how the implementation of the Project will impact the Grantee's operations.
- Scope of work, including training requirements
- Annual budget requirement
- Cost/benefit analysis
- Technical and training needs to implement each change
- An overall change management plan to implement the system upgrades

Task 9 Deliverable: The Contractor shall prepare a report including all work performed under Task 9. The Task 9 Deliverable shall be included in the Final Report.

Task 10: Conduct an Assessment of U.S. Sources of Supply

The Contractor shall conduct an assessment of the availability of potential U.S. sources of supply of equipment, systems, and services required for the implementation of the Project. For each source identified, the Contractor shall provide the contact name and titles and all contact information including telephone number, fax number, physical address, and e-mail address.

Task 10 Deliverable: The Contractor shall prepare a report including all work performed under Task 10. The Task 10 Deliverable shall be included in the Final Report.

Task 11: 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.

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 Electricity Company of Ghana Limited ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the ECG Smart Grid Applications project ("Project") in the Republic of Ghana ("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 the 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, I, 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 hereto, subject to written USTDA approval.

L. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is January 1, 2014, 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.:	11 13/14 1001
Activity No.:	2013-11002A
Reservation No.:	2013045
Grant No.:	GH201311045

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:
Title:
Phone:
Fax:
E-Mail:

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.

ANNEX 5

Terms of Reference

The purpose of this Study is to develop the planning and technical design aspects of a high-level distribution systems integration strategy, recommend a system that shall address business process planning and decision-making, and fully integrate the Grantee's distribution management systems. In addition, the Study shall include a training needs assessment and a training plan needed for the implementation of distribution automation and business process reengineering.

The scope of the Study shall include the entire distribution network of the Grantee including all business processes: Geographical Information System (GIS), Customer Information System (CIS), Supervisory Control And Data Acquisition (SCADA), Outage Management System (OMS), Work Flow Management System (WMS), Asset Management System (AMS), metering billing and collections, communications systems, business planning, regulatory compliance, investment programming, Customer Relations Management (CRM) and other operations. The Study shall focus both on distribution automation and business process reengineering.

The Contractor shall perform the following Tasks:

Task 1: Technical Assessment: Conduct a Review of the Existing Power Distribution System and Training Needs, Develop a Work Plan, and Submit Inception Report

Subtask 1.1: Conduct a Kick-Off Meeting: The Contractor shall organize a kick-off meeting with the Grantee and other relevant stakeholders. The Grantee shall coordinate with the Contractor to identify appropriate personnel and other relevant stakeholders to participate in the kick-off meeting. During the kick-off meeting, the Contractor shall introduce the Contractor's Study team; review the tasks to be performed under these Terms of Reference; review the Work Plan; and gather input from the Grantee regarding the Grantee's goals for the Study, salient issues surrounding the Grantee's plans for the Project, and the Grantee's requests for changes in the Work Plan, if any.

For the kick-off meeting, the Contractor shall coordinate with the Grantee to select appropriate meeting content; prepare an agenda, handouts, and presentation materials, as needed, for all meeting attendees; conduct the meeting and facilitate discussion; draft a report of the meeting and distribute the meeting report to meeting attendees and other relevant stakeholders as identified by the Grantee; and maintain meeting records, including the agenda, any handouts and presentation materials, a list of all meeting participants, and the meeting report.

Subtask 1.2: Conduct a Thorough Review of Available Documents, Information, Laws, and Regulations to Define the Context of the Study: At the start of the Study and following the project kick-off meeting, the Contractor shall conduct a thorough review of the following:

- Available forecasts for electricity demand in the Grantee's service area and Grantee's plans to meet the demand;
- The Grantee's current and projected electricity purchase and electricity sales tariffs;
- Current laws, regulations, standards, and institutions that would impact project implementation – rural and peri-urban connections rules, quality of supply and service standards issued by the Energy Commission of Ghana (the technical regulator),

performance benchmarks, licensing, and tariff filing regulation issued by the Public Utility Regulatory Commission (PURC – the economic regulator);

- Existing studies, analyses, implementation plans, and other available information relevant to the Study (the Grantee’s priorities, business plan, etc.);
- Currently planned investment projects and discussions with donors; and
- Any current interest from the private sector in various aspects of the Grantee’s distribution business.

Subtask 1.3: Review Current Distribution System Management Practices and IT Applications:

The Contractor shall visit the Grantee for a field mission and discussions, as well as to conduct an initial review of the Grantee’s existing processes and systems. The Contractor’s review shall include the Grantee’s following systems and processes, as well as overall operations:

- GIS Planning and Design
- Enterprise Resource Program (ERP)
- CIS
- OMS
- AMS
- Metering, Billing, and Collections
- CRM and Customer Database
- SCADA Transmission/Distribution Management and AutoCad for Design of SCADA Data
- Mobile Communications Inter-link needed for a two-way communications between the control center and work crew (a common practice in utilities for work flow management)
- Business Case Analysis – Financial Management, Investment Planning, Regulatory Compliance, Human Resource Management, and Related Business Processes
- Power System Analysis Tool (PSAT) for power flow analyses needed to ensure that the distribution lines and substations operate smoothly without being stressed and risking failure
- Communications System for Distribution Automation
- Vehicle Monitoring to monitor vehicle movements
- Automated Meter Reading (AMR) Systems and Smart Meter Systems
- Problems faced by the Grantee and the other Study stakeholders with the implementation of pre-paid meters
- Other areas as identified by the Grantee

In addition, the Contractor shall review the following operations:

- The Contractor shall meet with the transmission staff of the Ghana Grid Company Limited (“GRIDCo”), Ghana’s national electricity transmission company, to better understand how the Grantee interacts with GRIDCo at the transmission level. The Contractor shall also assess the future needs and integration requirements that will allow for better management of the Grantee’s distribution system and link to the national transmission system. Specifically, the Contractor shall review the Grantee’s procedures,

systems, and operations records to assess the transmission/distribution interface between GRIDCo and the Grantee.

- The Contractor shall also meet with the Energy Commission of Ghana to ensure that any technology recommendations resulting from the Study are consistent with the technical regulations and requirements of the Commission.

The Contractor shall review Ghana's currently available distribution operation and management data (power flows, voltages, outages, customer complaints, connections procedures, etc.) and assess future needs under an integrated distribution system. The Contractor shall review all databases and data collection systems currently in use at the Grantee's facility and identify any redundant processes and means for improving data quality and availability to facilitate timely management decisions.

Subtask 1.4: Conduct a Training Needs Assessment: The Contractor shall conduct a training needs assessment (TNA) that would assess and document the training and capacity building needs at all levels of the Grantee's operations, including upper management, linemen, and customer service personnel. In addition, the TNA shall focus on all business processes including the current human resource management at the Grantee's facilities and document the full range of training and capacity building requirements in various functional areas of the Grantee's operations. Based on this assessment the Contractor shall develop specific recommendations for the type of training needed to improve the Grantee's management and operations. The list of training activities documented by the Contractor shall include training activities that could be continued by the Grantee beyond this Study and the specific training to be provided as part of this Study under Task 2.

Subtask 1.5: Develop and Finalize the Inception Report and Work Plan: As part of this subtask and based on the previous subtasks, the Contractor shall develop an Inception Report for completing the Terms of Reference, incorporate any comments from the Grantee, and finalize the Work Plan. Specifically, the Inception Report shall include, any clarifications agreed to during the meetings, a list of the sites visited and key findings, a list of meetings held and summary of discussions, a detailed schedule of activities under the remainder of the Study, a list of data requirements, and a finalized Work Plan including proposed field trips under the various tasks. This Work Plan shall be the guiding document for the completion of the TA and submission of all deliverables.

Task 1 Deliverable: The Contractor shall prepare a report including all work performed under Task 1. The Task 1 Deliverable shall be included in the Final Report.

Task 2: Technical Assessment: Conduct a Technical Analysis and Identify Gaps and Requirements

Subtask 2.1: Conduct a Technical Analysis of the Existing Power Distribution System: The Contractor shall closely work with the Grantee's engineers and managers to conduct a detailed technical analysis of the distribution systems and business processes including the review of

documents, technical specifications, records, and visits to at least fifteen (15) sites, such as the various control centers and substations to be selected in consultation with the Grantee. The Contractor's technical analysis shall also include a documentation of current performance on relevant performance indicators, training requirements, and system requirements for moving forward with the Grantee's plans to implement an integrated and automated distribution system and capacity building for its workforce. The Contractor shall document areas where training would be required for the Grantee's managers and engineers and develop at least ten (10) course curricula for one-day, three-day, and five-day training programs. The training from this subtask is independent of the training outlined in subtask 2.4.

Subtask 2.2: Conduct a Gap Analysis: Building on the work conducted under Task 1 and Subtask 2.1, the Contractor shall define and describe the gaps in the Grantee's current distribution management systems, including human resources management and training. These gaps shall include all factors and issues that stand between the present state of the Grantee's distribution system and a technologically mature distribution operating company employing state-of-the-art information technology (IT) systems and smart grid distribution system solutions. The factors and issues that the Contractor shall cover in the gap analysis shall include, but not be limited to, the following:

- An evaluation of the interdependence of each system and ways to increase efficient information flow for different distribution operations;
- Presentation of current operational process and work flows;
- Gaps assessment in all technical and IT systems;
- Gaps in meeting quality of supply and service standards, performance standards, SCADA, outage management, and overall customer service;
- A review and evaluation of current human resources to determine future human resource needs; and
- Provide transfer of knowledge/information to the Grantee regarding best practices and lessons learned regarding the application of smart grid solutions for electricity distribution networks in other developed and developing countries.

Based on the activities conducted above, the Contractor shall prepare a gap analysis for each of the distribution processes and distribution management practices at the Grantee's facilities. The Contractor shall also compile quantitative data and potential key performance indicators (KPIs) to document the Grantee's current performance in key performance areas under review. The Contractor shall also identify any significant data gaps or concerns with data quality.

Subtask 2.3: Develop Recommendations to Address the Identified System Gaps: Based on the results of Subtask 2.2, the Contractor shall develop a set of detailed written recommendations for the Grantee which adhere to industry proven practices that would enhance the Grantee's distribution system management, customer service, regulatory compliance, system maintenance, and investment programming. The Contractor shall identify and propose annual targets for key performance metrics in order to ensure accountability for results and objective monitoring of performance improvements resulting from the recommended actions.

The Contractor shall also develop detailed performance-based specifications for the recommended investments and practices that fill the identified system gaps and facilitate full Project implementation, including, at a minimum, the following:

- AMR systems;
- Accuracy and timeliness of data collection;
- Ability to collect data for introduction of various advanced tariffs, such as time-of-use and interruptible tariffs;
- Integration of smart meters into the Grantee's existing and planned electricity distribution and customer information systems;
- Active and reactive energy control and distribution loss reduction;
- Protection and control systems with automatic system reconfiguration in response to faults;
- Distribution transformer monitoring;
- Automated line devices and switches;
- Reactive power control systems;
- Combating electricity theft;
- Customer load control;
- Customer-side electrical safety, such as overload protection, overheating, and electrical shock;
- Customer options, including electricity budgeting; and
- Energy efficiency measures.

The specifications shall comply with Host Country standards for distribution management and operations requirements.

In developing the IT systems and smart grid requirements to address the gaps, the Contractor shall review the current and planned regulatory standards requirements and statutes put forth by the Energy Commission of Ghana and ensure that any plans for integration comply with these requirements and statutes. Specifically, the Contractor shall ensure that the systems and technologies recommended for the Grantee meet the following criteria and requirements, among others, as identified by the Grantee and Contractor:

- All technical (including system interface and information exchange) requirements for integrating the Project into the Grantee's existing and planned electricity distribution and customer information systems;
- Step-by-step recommendations for carrying out the integration strategy;
- Cost estimates for implementing the integration strategy, including costs of required upgrades to existing systems;
- Clear descriptions of the changes that would occur in the Grantee's electricity distribution network as a result of the integration strategy; and
- Justifications for the investment requirements of the integration strategy based on a cost-benefit analysis.

The requirements developed by the Contractor shall take into account the emerging technologies and smart grid solutions for distribution systems that impact all regulatory reliability and operational initiatives.

Subtask 2.4: Provide Training to the Grantee's Managers and Technical Personnel:

Based on subtasks 2.1 – 2.3, the Contractor, in consultation with the Grantee, shall select two high priority capacity building and training subjects from the TNA developed under Task 1. The Contractor shall develop and deliver two one-week training programs to Grantee personnel in these two priority areas selected by the Grantee. Potential areas of training may include methods to mitigate high distribution losses and poor collections. The training program shall include the following:

- A detailed definition of the subject areas and training contents;
- A detailed training book with a day-by-day agenda for in-class course delivery;
- Lab exercises and site visits developed in consultation with the Grantee to integrate field work with in-class training;
- At least two case studies of two utilities in the United States, to demonstrate the applicability of the recommended technologies and systems to the Grantee's distribution operations;
- Frequent question and answer (Q&A) sessions to ensure comprehension of the subject matter by the participants; and
- A training course evaluation survey at the end of the five-day course.

In addition to the two five-day courses, the Contractor shall provide on-the-job training to the Grantee's managers and engineers during all field missions by working side-by-side with them and involving them in all site visits and simulation exercises. This on-the-job training shall include work sessions with the Grantee personnel on the specific analyses included in the remainder of the tasks in the Study.

Task 2 Deliverable: The Contractor shall prepare a report including all work performed under Task 2. The Task 2 Deliverable shall be included in the Final Report.

Task 3: Develop Cost Estimates and Investment Needed for the Identified System Requirements to Meet the Gaps

Based on the system requirements developed under Task 2 to address the gaps in the Grantee's distribution system and management practices, the Contractor shall develop detailed cost estimates for the implementation of the training plan, various equipment, hardware, software, licenses, and training needed for the next stage program implementation. The cost estimates shall be based on industry quotes for the various items as well as all material and installation costs based on prevailing local costs in Ghana. The Contractor shall closely work with the Grantee in developing the cost estimates.

Based on the cost estimates, the Contractor shall develop an investment program for the Grantee, including capital costs, equipment costs, licensing fees, system operations and maintenance costs, and any costs associated with staff and engineer training in order to implement the recommended solutions. The Contractor shall perform a life cycle cost analysis of the proposed equipment and systems for the Project when developing the investment program.

In consultation with the Grantee, the Contractor shall organize the investment program into two phases. Phase I shall focus on the highest priority investments (the first two-to-three years of implementation) and Phase II shall include medium- to long-term investment requirements. The Contractor shall structure this approach in a way to assist the Grantee in its internal budgeting process and in seeking financing from the Millennium Challenge Corporation (MCC), the World Bank, the African Development Bank, and any other relevant investors as determined by the Contractor and Grantee for the Project.

In developing the cost estimates for various systems, technology, and components, the Contractor shall deploy state-of-the-art systems for, but not limited to, the following:

- CIS
- GIS
- PSAT
- OMS – including devices and sensors required to effectively monitor and control outages in addition to the central management system
- AMS
- WMS
- CRM
- Distribution IT Integration Systems and Bus Bars

The investment program shall also identify KPIs, their baselines, and propose annual targets that align with the gap analysis and recommendations. If there are data gaps or significant problems with data quality, the Contractor shall develop recommendations on ways to improve data quality and availability and cost them out in the investment program in order to ensure accountability for results and objective monitoring of performance.

Task 3 Deliverable: The Contractor shall prepare a report including all work performed under Task 3. The Task 3 Deliverable shall be included in the Final Report.

Task 4: Conduct an Economic and Financial Analysis of Recommended Investments in Capacity Building and Smart Grid Applications

Based on the total investment requirements for Phase I and Phase II and life cycle cost analysis of equipment and systems, the Contractor shall conduct detailed economic and financial analyses of the proposed investments using an internationally acceptable methodology for such analyses. The Contractor's financial analyses of the Project shall be based on a standard methodology used by donors, such as MCC, the World Bank, the African Development Bank, and any other relevant investors as determined by the Contractor and Grantee for appraising investment

projects. The Contractor shall consult with potential donors when developing the analysis. The Contractor shall calculate both the economic and financial internal rates of return for the recommended investments under a variety of different assumptions such as different interest rates, depreciation, licensing fees, import duties, etc.

In addition, the Contractor shall conduct a sensitivity analysis of the return on investment for two-to-three practical financial packages for financing the investments. The Contractor's sensitivity analysis shall account for the cost recovery indicators based on different assumptions for key project variables, such as electricity tariffs, sales volumes, capital and operating cost estimates, and interest rates and investment requirements.

As the first step under this task, the Contractor shall acquire and compile historical and projected energy and capacity information in Ghana for use in assessing the market for the Project. In addition to the capital costs, the Contractor shall provide an estimate of projected operating expenses, including a detailed breakdown of the general, administrative, operating, and maintenance costs for the Project. As part of the financial and economic analysis, the Contractor shall take into consideration the escalation of the costs over a two (2) to five (5) year period.

The Contractor shall estimate the projected savings of the Project. In addition, the Contractor shall develop a cash balance *pro forma* that presents the net cash savings from the proposed investments determined by netting revenue against costs.

The Contractor shall prepare a financial analysis and model of the project, considering alternative methods and sources of financing, including grants and concessionary financing, and debt. The financial model shall be a tool for defining the terms and conditions of the financing structure and testing the volatility of the Project's ability to service its debt.

Following discussions with the Grantee, the Contractor shall select an "optimum," "minimum," and "most likely" economic/financial scenario for which to develop financial documentation that may be used by the Grantee for presentation to its financial officials. The Contractor shall also rank the investments in terms of their financial viability and likely investor interest. This Contractor shall include this documentation in the Final Report.

The Contractor shall also provide a working seminar to the Grantee's economists and financial analysts as selected by the Grantee and train them on the use of the model developed under this task. The Contractor shall deliver the economic/financial model to the Grantee and install it on the Grantee's computers for use by the Grantee's personnel.

Task 4 Deliverable: The Contractor shall prepare a report including all work performed under Task 4. The Task 4 Deliverable shall be included in the Final Report.

Task 5: Develop a Blue Print for Financing the Investments Needed in Phase I and Phase II

The Contractor shall develop two options for financing the projects – one for Phase I and the other for Phase II investments. The Contractor shall identify project risk factors and develop a risk avoidance/reduction plan for each factor by means of insurance and bonding or other means, adequate to the requirements of the funding sources, including host country sources, multilateral financiers, and others.

Specifically, the Contractor shall identify and analyze the following potential sources for financing the Project in both Phase I and Phase II:

- Internal funds from the Grantee's resources or the Government of Ghana's budget
- Combination of internal budget funds and development financing from international financial institutions
- Combination of the above and export credit financing from the U.S. Export-Import Bank
- Blended financing from debt and equity from a variety of donors
- Potential grant funding from MCC and other U.S. government donor agencies

Task 5 Deliverable: The Contractor shall prepare a report including all work performed under Task 5. The Task 5 Deliverable shall be included in the Final Report.

Task 6: Conduct a Review of Regulatory Issues Related to the Project

The Contractor shall conduct an analysis of the anticipated Ghanaian laws, standards, and institutions, which could impact the Project's implementation. In addition, the Contractor shall identify and assess any regulatory barriers that may impede the development, financing, and implementation of the Project in the Grantee's distribution operations in Ghana.

Specifically, the Contractor shall analyze all regulatory issues that could impact the implementation of the proposed technologies and systems for distribution automation and business process reengineering at the Grantee. The Contractor's analysis shall include all pertinent documents that deal with import taxes, duties and fees, corporate and personal income taxes, and property and other taxes related to the implementation of the Project. The Contractor's analysis shall also include all permitting requirements, foreign participation regulations, regulations that impact environmental requirements, and any other regulatory issues that will have a significant impact on the Project, as well as reporting on the quality of service and supply standards required by the regulators.

The Contractor shall recommend remedial actions to mitigate any regulatory barriers. In addition, the Contractor shall recommend actions to comply with all regulatory requirements.

The Contractor shall deliver a stand-alone report to the Grantee on the regulatory assessment related to implementing the Project both in the immediate time frame (Phase I) and in the medium- to long-term (Phase II). The Contractor shall share these findings of this task with all relevant Ghanaian stakeholders including the Energy Commission of Ghana and Ghana's Northern Electricity Distribution Company (NEDCo).

Task 6 Deliverable: The Contractor shall prepare a report including all work performed under Task 6. The Task 6 Deliverable shall be included in the Final Report.

Task 7: Conduct Preliminary Environmental and Social Impact Assessments

The Contractor shall evaluate and report on the expected environmental impacts of the proposed project with reference to local, national and international laws and regulations, including those of international finance institutions, such as the World Bank, the African Development Bank, the International Finance Corporation (IFC), MCC (MCC uses the same standards as the IFC) and private banks. Some of the Contractor's analysis shall be a part of Task 1 and Task 2, so that any cost impacts can be captured for the economic and financial analysis.

The Contractor's review shall identify potential negative impacts, discuss the extent to which they can be mitigated, and develop plans for a full environmental impact assessment if and when the project moves forward to the implementation stage. The Contractor's assessment shall include the identification of the steps that the Grantee will need to undertake subsequent to the Study's completion and prior to Project implementation.

In addition, the Contractor shall conduct an analysis of the likely social impacts of the proposed distribution projects. Specifically, the Contractor shall estimate the following types of impacts:

- Impact on social changes as a result of electricity access such as rural-urban trade and integration, impact on the quality of education and health services, etc.
- Impact on any local economic activity such as the creation of local small businesses and income generation
- Any other impacts in social behavior and social discourse

Task 7 Deliverable: The Contractor shall prepare a report including all work performed under Task 7. The Task 7 Deliverable shall be included in the Final Report.

Task 8: Conduct an Analysis of the Key Host Country Development Impacts

The Contractor shall conduct a development impact assessment of the Project. The purpose of the development impact assessment is to provide the Project's decision makers and interested parties with a broader view of the Project's potential effects on Ghana. The Contractor's analysis shall focus on what development impact is likely if the project is implemented according to the Study's recommendations. While specific focus shall be paid to the immediate impact of the Project, the Contractor's analysis shall include any additional development benefits that may result from the Project's implementation, including spin-off and demonstration effects. The Contractor's development impact assessment shall identify the anticipated impacts of the Project in the following categories:

- Infrastructure: The Contractor shall identify the anticipated infrastructure impacts of the Project, giving a brief synopsis and concrete examples of infrastructure impacts.

Examples of infrastructure impacts related to implementation of the Project may include the installation of smart meters, as well as associated communication infrastructure and other related hardware and software systems. The Contractor shall provide specific information about the anticipated infrastructure impacts of the Project, such as the anticipated number smart grid technology to be installed, details regarding anticipated improvements in the Grantee's communication infrastructure and other related hardware and software systems, and the impact of the Project on the Grantee's existing and planned electricity distribution and customer information systems.

- Human Capacity Building: The Contractor shall identify the anticipated number and types of local jobs that would be created or retained as a result of the Project. The Contractor shall also identify the number of local people who would receive training and the types of training programs required to implement and sustain the Project. The Contractor shall not include training performed under these Terms of Reference in the development impact assessment.
- Technology Transfer and Productivity Enhancement: The Contractor shall identify the anticipated advanced technologies that would be utilized for the Project. The Contractor shall also identify anticipated efficiencies that would be gained as a result of the Project. Examples of efficiencies related to implementation of the Project may include higher output per resource use, lower costs, or other common measures of efficiency used in the electricity distribution industry.
- Market Oriented Reforms: The Contractor shall provide a description of any regulations, laws, standards, or institutional changes that are recommended pursuant to these Terms Of Reference and the effect they would have if implemented.
- Other: The Contractor shall identify any other anticipated development impacts or benefits that would result from the Project, such as improved financial revenue flows to the Grantee and other stakeholders, improvements in Ghana's energy security, reduced emissions of greenhouse gases and other harmful pollutants, positive spin-off effects on other economic sectors, etc.

The Contractor shall develop a methodology for assessing these impacts over time, and shall identify where to obtain this information in the future.

Task 8 Deliverable: The Contractor shall prepare a report including all work performed under Task 8. The Task 8 Deliverable shall be included in the Final Report.

Task 9: Develop a Five-Year Project Implementation Plan and Budget

Based on the activities conducted under Tasks 1 through 8, and specifically the gaps identified in the Grantee's distribution system and management practices, the Contractor shall develop a detailed five-year implementation plan and budget (Implementation Plan) for the Project based on the final agreed-upon capacity building and training requirements, IT systems and smart grid systems as recommended by the Contractor and adopted by the Grantee. The Contractor's

Implementation Plan shall provide the Grantee with a detailed description of the gaps and the options to mitigate each of them, coupled with a cost/benefit breakdown for each option. The Contractor's Implementation Plan shall also identify KPIs, their baselines, and propose annual targets that align with regulatory and business plan targets. If there are data gaps or significant problems with data quality, the Contractor shall identify recommendations on how to improve data quality and availability in order to ensure accountability for results and objective monitoring of performance at the Grantee.

The Contractor shall make a clear distinction for the high priority investments planned during Phase I (the first two-to-three years following the Study's completion) and Phase II (medium- to long-term).

The Contractor shall provided the Grantee with the following items which are relevant to the Implementation Plan:

- A recommended schedule for Project implementation, including recommendations for phasing, milestones, and prioritization of investments
- An outline of all the steps the Grantee will need to take subsequent to the Study's completion and prior to project implementation, such as:
 - Environmental and social impact assessments that comply with local environmental and social requirements and those of multilateral lending agencies such as MCC, the World Bank and the African Development Bank;
 - Licensing, permitting, and other relevant legal and regulatory requirements;
 - Financial arrangements;
 - Procurements of goods and services;
 - Systems integration;
 - Operations and maintenance; and
 - Short- and long-term training requirements.
- An assessment of how the implementation of the Project will impact the Grantee's operations.
- Scope of work, including training requirements
- Annual budget requirement
- Cost/benefit analysis
- Technical and training needs to implement each change
- An overall change management plan to implement the system upgrades

Task 9 Deliverable: The Contractor shall prepare a report including all work performed under Task 9. The Task 9 Deliverable shall be included in the Final Report.

Task 10: Conduct an Assessment of U.S. Sources of Supply

The Contractor shall conduct an assessment of the availability of potential U.S. sources of supply of equipment, systems, and services required for the implementation of the Project. For each source identified, the Contractor shall provide the contact name and titles and all contact information including telephone number, fax number, physical address, and e-mail address.

Task 10 Deliverable: The Contractor shall prepare a report including all work performed under Task 10. The Task 10 Deliverable shall be included in the Final Report.

Task 11: 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.

ANNEX 6



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>	<input type="checkbox"/> Feasibility Study	<input type="checkbox"/> Technical Assistance	<input type="checkbox"/> Other (specify)
---	--	---	--

Activity Title *[To be completed by USTDA]*

Full Legal Name of U.S. Firm

Business Address (street address only)

Telephone	Fax	Website
-----------	-----	---------

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

Type of Ownership	<input type="checkbox"/> Publicly Traded Company
	<input type="checkbox"/> Private Company
	<input type="checkbox"/> 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?	<input type="checkbox"/> Yes
	<input type="checkbox"/> No

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?	<input type="checkbox"/> Yes
	<input type="checkbox"/> No

If yes, U.S. Firm shall complete Attachment C for each subcontractor. Attached?	<input type="checkbox"/> Yes
	<input type="checkbox"/> Not applicable

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 <i>[To be completed by USTDA]</i>	
---	--

Activity Title <i>[To be completed by USTDA]</i>	
--	--

Full Legal Name of U.S. Firm	
------------------------------	--

Full Legal Name of Shareholder	
--------------------------------	--

Business Address of Shareholder (street address only)	
---	--

Telephone number		Fax Number	
------------------	--	------------	--

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

Country of Shareholder's Principal Place of Business	
--	--

Please provide a list of directors and principal officers as detailed in Attachment A. Attached?	Yes
--	-----

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.	
---	--

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.	
--	--

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 [To be completed by USTDA]	
--	--

Activity Title [To be completed by USTDA]	
---	--

Full Legal Name of Prime Contractor U.S. Firm ("U.S. Firm")	
---	--

Full Legal Name of Subcontractor	
----------------------------------	--

Business Address of Subcontractor (street address only)	
---	--

Telephone Number	
------------------	--

Fax Number	
------------	--

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

Subcontractor Point of Contact

Name	Surname	
	Given Name	

Address	
---------	--

Telephone	
-----------	--

Fax	
-----	--

Email	
-------	--

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
--	--------------------------------------	------------------------------	--------------------------------------	--	--------------------------------

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	

ANNEX 7



U.S. TRADE AND DEVELOPMENT AGENCY

MODEL CONTRACT FOR USTDA-FUNDED FEASIBILITY STUDY

This is a model contract, designed only to facilitate the drafting of a Contract between the Grantee and the U. S. Contractor with respect to the performance of a USTDA-funded feasibility study. It is important to note that USTDA is not a party to the contract. All contracts for USTDA-funded studies must contain the following:

- 1) USTDA Mandatory Clauses, which are set forth as Annex II to the Grant Agreement that funds this study;*
- 2) Terms of Reference for the study, which is set forth in Annex I to the Grant Agreement (The Contract's Terms of Reference must be identical to the Grant Agreement's or a separate written explanation must be provided to USTDA for approval by the Client and the Contractor at the time of Contract review);*
- 3) Payment provisions that conform with the requirements set forth in USTDA Mandatory Clause I (Clauses 3 and 4 of this model contract may be used as an example);*
- and 4) In the event that the contract is executed in two languages, a contract provision which states that English must be the controlling language.*

Otherwise, the Grantee and the Contractor are free to use all, some, or none of this model as the basis of their negotiations and final agreement. The information in italics is intended to provide guidance and should not be included in the text of the final contract.

Either the Contractor or the Grantee may submit a copy of the signed contract or a final negotiated draft version to USTDA for review and approval. USTDA's approval may be contingent upon certain modifications being made to the contract if USTDA determines such modifications are required to ensure that the text of the contract is consistent with the terms and objectives of the Grant Agreement and USTDA policy.

USTDA Grant funds will not be disbursed until USTDA receives a signed copy of the contract, containing any required USTDA modifications, and issues the parties a written approval letter.

CONTRACT FOR _____ [STUDY TITLE]

This Contract is made and entered into by and between _____ (hereinafter referred to as the "Client") and _____, a United States firm incorporated in _____ with its principal offices located at _____ in the State of _____ (hereinafter referred to as the "Contractor").

WHEREAS, the Client has requested the Contractor to prepare a feasibility study on the project (the "Study"), and the Contractor has agreed to prepare the Study in accordance with the terms and conditions set forth in this Contract;

NOW, THEREFORE, in consideration of the mutual terms and conditions set forth in this Contract, the parties hereto agree as follows:

1. Appointment

The Contractor shall perform the Study in accordance with the terms and conditions set forth in this Contract and the following annexes which are hereby incorporated by reference into this Contract. *[Additional Annexes, such as those set forth in Annexes IV and V below, may be added in appropriate cases]*

- | | |
|------------------|--|
| Annex I: | Terms of Reference <i>[must be identical to the Grant Agreement Terms of Reference or a separate written explanation must be provided to USTDA for approval by the Client and the Contractor at the time of Contract review]</i> |
| Annex II: | USTDA Mandatory Clauses |
| Annex III: | Personnel |
| <i>[Annex IV</i> | <i>Schedule of Events]</i> |
| <i>[Annex V:</i> | <i>Counterpart Client Personnel, Assigned Specialists, Equipment, and Facilities to be Provided by the Client]</i> |

2. Effective Date of the Contract

This Contract shall be effective upon signature by both parties.

[The Contract's effective date should not precede the effective date of the Grant Agreement. Contracts, and any amendments, including assignments and changes to the Terms of Reference, must be agreed to in writing by USTDA in order to be effective with respect to the expenditure of USTDA Grant funds.]

3. Payment Schedule

The U.S. Trade and Development Agency ("USTDA") has made a Grant of _____ *[spell out amount]* United States Dollars (U.S.\$ _____) available to the Client for the Study ("Grant Funds") pursuant to the Grant Agreement between USTDA and the Client, dated _____ ("Grant Agreement"). In consideration for the Contractor's performance of the Study, the Client shall arrange for the Grant Funds to be disbursed by USTDA directly to the Contractor as follows:

- (1) US\$ _____, a mobilization payment, upon signature of the contract and approval by USTDA *[not to exceed 20 % of the total Grant Funds]*.
- (2) US\$ _____ upon completion of _____. *[milestone]*
- (3) US\$ _____ upon completion of _____. *[milestone]*
- (4) US\$ _____ *[this amount should not be less than 15% of the total USTDA Grant Funds]* upon receipt by USTDA of the Final Report in accordance with the specifications and quantities set forth in the USTDA Mandatory Clauses. *[If the Contractor is making a Cost Share contribution to this study, add the following additional sentence.]* In addition, a financial officer of the Contractor must provide the Cost Share certification contained in the USTDA Mandatory Clauses.

[The above payment schedule should be based upon completion of performance milestones rather than automatic chronological installments. For example, these milestones could be based upon completion of tasks set out in the Annex I Terms of Reference or in the Annex IV Schedule of Events.]

4. Method of Payment

In accordance with the payment schedule set forth in Clause 3 above, the Contractor shall submit invoices, containing the certification set forth in Clause [I] of the USTDA Mandatory Clauses, to the Client for approval. The Client shall approve, in accordance with the disbursement procedures in Clause [I] of the USTDA Mandatory Clauses, or disapprove each invoice within ___ *[15]* ___ days of its receipt. If the Client disapproves an invoice, the Client shall so inform the Contractor in writing, setting out the reasons for disapproval in order to enable the Contractor to take appropriate corrective measures. After the Client approves an invoice and the invoice is received by USTDA, USTDA shall make its respective disbursement of the Grant Funds directly to the Contractor in the United States.

5. Supply of Personnel

The Study shall be carried out by the personnel specified in Annex III for the respective periods of time covered by this Contract. Curriculum Vitae should be attached to this Annex for each person listed and must be signed by the individual assuring their availability to the Contractor and their commitment to the Study. The Contractor hereby agrees that the personnel listed in this Annex will be utilized to perform the Study.

6. Procedures for Substitution of Personnel

Except as the Client may otherwise agree, no changes shall be made in the personnel specified in Annex III. If, for any reason beyond the reasonable control of the Contractor, it becomes necessary to replace any person specified in Annex III, the Contractor shall provide a replacement of equivalent or superior qualifications. Any additional costs incurred by reason of such substitution shall be at the expense of the Contractor. In the event any person specified in Annex III is found by the Client to be unsuitable or incompetent in discharging his assigned responsibilities, the Client may request the Contractor to provide a replacement within a reasonable period of time. Any additional costs incurred by reason of such replacement shall be at the expense of the Contractor.

7. Permits and Approvals

The Client shall facilitate the timely granting to the Contractor, its authorized subcontractors, and affiliates, and, where applicable, their dependents, of visas, licenses, permits, and customs clearance for entry and exit, and the privilege of bringing into the host country reasonable amounts of foreign currency for the purpose of carrying out the Contract.

8. Force Majeure

If either of the parties to this Contract is prevented from performing any of its obligations under the Contract by events of Force Majeure, such as war, fire, flood, earthquake, or any other event beyond the reasonable control of such party, the time period for performance of such obligations shall be extended by a period equal to the delay caused by such event, and the parties hereto shall conduct friendly negotiations as soon as possible to find a mutually satisfactory solution to the problems caused by such events.

[Please note that any extensions, changes, modifications, etc. resulting from Force Majeure would be subject to written USTDA approval as set forth in the USTDA Mandatory Clauses.]

9. Suspension and Termination of the Contract

(a) Suspension of the Contract

If any of the following events shall have happened and be continuing, either party may, by written notice to the other party and USTDA, suspend in whole or in part this contract:

(1) USTDA shall have suspended disbursements from the Grant Agreement covering this contract; or

(2) A default shall have occurred in the performance of any obligation of the other Party under this contract.

(b) Termination of the Contract

If any of the following events shall have happened and be continuing, either party may, by written notice to the other party, terminate the Contract:

(1) Any of the conditions referred to in Paragraph (a) above shall continue for a period of thirty (30) days after the Party shall have given written notice to the other party of the suspension of the Contract; or

(2) The Grant Agreement between USTDA and the Client shall have been terminated.

In any event, either Party may terminate the Contract at any time by giving not less than sixty (60) days written notice to the other party and USTDA.

(c) Termination Procedures

Upon termination of the Contract, the Contractor shall take immediate steps to terminate the performance of the Study in a prompt and orderly manner and to reduce losses and to keep further expenditures to a minimum.

10. Business Practices

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

11. Standards of Conduct

The Contractor shall exercise all reasonable skill, care, and diligence in the performance of the Study under this Contract and shall carry out its responsibilities in accordance with recognized professional standards. The Contractor and its employees, agents, and subcontractors, if any, shall respect and abide by all applicable laws and regulations of the host country.

12. Liability

The Contractor and any subcontractor shall be liable to the Client for performance of the Study in accordance with the provisions of this Contract and for any loss suffered by the Client as a result of a default of the Contractor in such performance, subject to the following limitations:

(a) the Contractor shall not be liable for any damage or injury caused by or arising out of the act, neglect, default or omission of any persons other than the Contractor, its Subcontractors or the personnel of either of them; and

(b) the Contractor shall not be liable for any loss or damage caused by or arising out of circumstances over which the Contractor had no control.

13. Amendment Procedures

All changes, modifications, and amendments to this Contract, including its Annexes, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

14. Dispute Resolution

(a) All disputes between the parties hereto arising in connection with this Contract shall be settled if possible through friendly negotiations between the parties hereto. In case no settlement can be reached within ninety (90) days after a dispute arises, either party may request that the dispute be submitted for arbitration.

(b) The arbitration shall take place in _____ and be conducted by _____ [arbitration organization] in accordance with the procedural rules of [arbitral rules, e.g., UNCITRAL]. The arbitration shall be conducted in the _____ language, and _____ [state and/or country] substantive law shall be applied. The decision of the arbitrators shall be final and binding upon both parties.

15. Succession

This Contract is binding upon the Parties' successors.

16. Addresses of Record

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

(a) For the Client: _____

(b) For the Contractor: _____

[It may be useful to also list the title of the person responsible for the day-to-day management of the Contract]

All such communications between the parties shall be in the _____ language. Any communications between either of the parties and USTDA shall be in the English language.

[The Contract and all subcontracts, invoices, final reports, and other documents directed to USTDA must be in English]

17. Language

This Contract has been executed in the English language, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

18. Entire Agreement

This Contract, including its annexes, contains all covenants, stipulations and provisions agreed by the Parties hereto. No agent or representative of either party has authority to make, and the parties shall not be bound by or be liable for, any statement, representation, promise or agreement not set forth herein.

IN WITNESS WHEREOF, the parties hereto, each acting through its duly authorized representative, have caused this Contract to be signed.

For *[CLIENT]*

For *[CONTRACTOR]*

By: _____
[name and title]

By: _____
[name and title]

Date: _____

Date: _____

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses *[This Annex must contain the actual text from the corresponding USTDA Grant Agreement, normally found in Annex II thereto]*

[Other Annexes listed]

[Please remember to attach all Annexes]

(2/28/08 version)