REQUEST FOR PROPOSALS

FEASIBILITY STUDY FOR THE

ZACATECAS LANDFILL GAS PILOT PROJECT IN MEXICO

Submission Deadline: **4:00 PM**

LOCAL TIME (ZACATECAS, MEXICO)

DECEMBER 16, 2011

Submission Place: **Arnoldo Rodríguez Reyes**
Presidente Municipal
Gobierno Municipal de Zacatecas
Calzada Héroes de Chapultepec 1110
Colonia Lázaro Cárdenas, C.P. 98040
Municipio de Zacatecas, Zacatecas
Mexico
Phone: (52-492) 923-9421

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

SECTION 1: INTRODUCTION

The U.S. Trade and Development Agency ("USTDA") has provided a grant in the amount of US$278,000 to the Municipal Government of Zacatecas (Gobierno Municipal de Zacatecas) (the "Grantee") of Mexico (the "Host Country") in accordance with a grant agreement dated June 29, 2011 (the "Grant Agreement") to fund a feasibility study ("Feasibility Study") for the Zacatecas Landfill Gas Pilot Project (the "Project"). This Feasibility Study will provide the Grantee with recommendations to enable the development of a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas. The Grant Agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to perform the Feasibility Study.

1.1 BACKGROUND SUMMARY

The Municipal Government of Zacatecas is committed to diversifying its energy resources to meet its growing demand for energy through the use of renewable energy sources. Meanwhile, at a national level, Mexico has recently taken steps to encourage the use of renewable energy, including a regulatory policy that allows states, municipalities, and private companies to develop their own renewable energy sources. Under this regulatory policy, the Grantee is planning to develop a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas.

The Feasibility Study will allow the Grantee to assess recoverable landfill gas resources, conduct a preliminary conceptual design of the Project, and draft legal documents and agreements. The Municipal Government of Zacatecas is cooperating with three neighboring municipalities on a new 25-hectare landfill that would host the Project. The Project is expected to lead to the development of additional landfill gas recovery projects in municipalities throughout Mexico.

The Project supports the Energy and Climate Partnership of the Americas, the U.S.-Mexico Bilateral Framework on Clean Energy and Climate Change, and Mexico's National Infrastructure Program.

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

1.2 OBJECTIVE

The objective of the Zacatecas Landfill Gas Pilot Project Feasibility Study is to enable the development of a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas.

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$278,000. **The USTDA grant of US$278,000 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$278,000 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 the "Zacatecas Landfill Gas Pilot Project."

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$278,000.

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 Spanish.

2.13 PROPOSAL SUBMISSION REQUIREMENTS

The Cover Letter in the proposal must be addressed to:

Arnoldo Rodríguez Reyes
Presidente Municipal
Gobierno Municipal de Zacatecas
Calzada Héroes de Chapultepec 1110
Colonia Lázaro Cárdenas, C.P. 98040
Municipio de Zacatecas, Zacatecas
Mexico
Phone: (52-492) 923-9421

An original in English, an original in Spanish, one (1) copy in English, and three (3) copies in Spanish of your proposal must be received at the above address no later than 4:00 PM, on December 16, 2011.

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

Each 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 in English, the original in Spanish, one (1) copy in English, and three (3) copies in Spanish 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 the 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, technical assistance, 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$278,000 which is a fixed amount.

Offerors shall submit one (1) original in English, one (1) original in Spanish, one (1) copy in English, and three (3) copies in Spanish of the proposal. Proposals received by fax cannot be accepted.

Each proposal must include the following:

Transmittal Letter,
Cover/Title Page,
Table of Contents,
Executive Summary,
Firm Background Information,
Completed U.S. Firm Information Form,
Organizational Structure, Management Plan, and Key Personnel,
Technical Approach and Work Plan, and
Experience and Qualifications.

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

3.1 EXECUTIVE SUMMARY

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

3.2 U.S. FIRM INFORMATION

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

3.3 ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL

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

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

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

3.4 TECHNICAL APPROACH AND WORK PLAN

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

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

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

3.5 EXPERIENCE AND QUALIFICATIONS

Provide a discussion of the Offeror's experience and qualifications that are relevant to the objectives and TOR for the Feasibility Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project.

The Offeror shall provide information with respect to relevant experience and qualifications of key staff proposed. The Offeror shall include letters of commitment from the individuals proposed confirming their availability for contract performance.

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

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

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

SECTION 4: AWARD CRITERIA

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

The selection of the Contractor will be based on the following criteria and their corresponding assigned weights:

1. Offeror's experience with landfill gas recovery project design and development and experience of key personnel in the following areas (25%):
   - Project management of international energy projects
   - Conducting field assessments for landfill gas recovery projects
   - Financing international energy projects

2. Offeror's experience conducting similar feasibility studies for international landfill gas recovery projects (25%)

3. Adequacy, soundness, and thoroughness of the Technical Approach and Work Plan (20%)

4. Offeror's experience with regulatory and environmental issues related to landfill gas recovery projects (15%)

5. Offeror's experience in Mexico (10%)

6. Offeror's experience and ability to work in the Spanish language (5%)

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

Price will not be a factor in Contractor selection.

ANNEX 1

FEDBIZOPPS ANNOUNCEMENT

Arnoldo Rodríguez Reyes, Presidente Municipal, Gobierno Municipal de Zacatecas, Calzada Héroes de Chapultepec 1110, Colonia Lázaro Cárdenas, C.P. 98040, Municipio de Zacatecas, Zacatecas, Mexico, Phone: (52-492) 923-9421

B – Mexico: Zacatecas Landfill Gas Pilot Project Feasibility Study

POC: Robin Yavuz, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Zacatecas Landfill Gas Pilot Project Feasibility Study, Mexico.

The Grantee (the Municipal Government of Zacatecas) 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 conduct a Feasibility Study for the Zacatecas Landfill Gas Pilot Project.

The solicitation for this Feasibility Study was originally posted on August 8, 2011, and was suspended on September 28, 2011. Please note that several modifications have been made to the original solicitation.

The objective of the Zacatecas Landfill Gas Pilot Project Feasibility Study is to enable the development of a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas. The Feasibility Study will allow the Grantee to assess recoverable landfill gas resources, conduct a preliminary conceptual design, and draft legal documents and agreements.

The Terms of Reference ("TOR") for the Feasibility include the following tasks: 1) Kick-Off Meeting and Inception Report; 2) Technical Analysis; 3) Preliminary Conceptual Design and Technical Configuration; 4) Financial Analysis; 5) Economic Analysis; 6) Financing Plan; 7) Preliminary Environmental Impact Assessment; 8) Regulatory Review; 9) Development Impact Assessment; 10) U.S. Sources of Supply; 11) Implementation Plan; and 12) Final Report.

The U.S. firm selected will be paid in U.S. dollars from a $278,000 grant to the Grantee from the U.S. Trade and Development Agency ("USTDA").

A detailed Request for Proposals ("RFP"), which includes requirements for the Proposal, the Terms of Reference, and portions of a background Definitional Mission report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to:

https://www.ustda.gov/businessopps/rfpform.asp.

Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want

USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

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

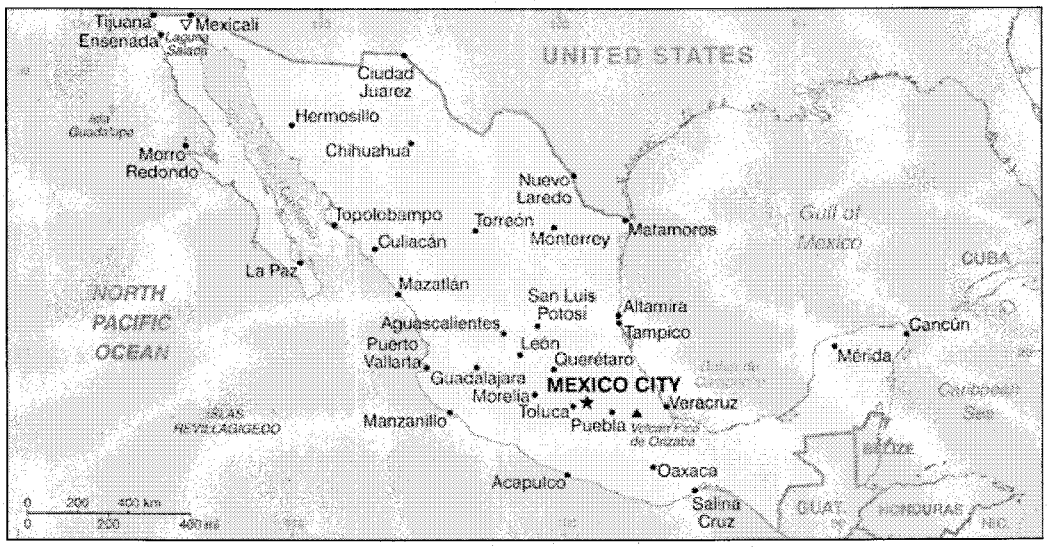
Interested U.S. firms should submit their Proposal in English and Spanish directly to the Grantee by 4:00 PM (local time in Zacatecas, Mexico), December 16, 2011, at the above address. Evaluation criteria for the Proposal are included in the RFP. Price will not be a factor in Contractor selection, and 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

PORTIONS OF BACKGROUND DEFINITIONAL MISSION REPORT

EMG
ENERGY MARKETS GROUP

Definitional Mission Report
Mexico Renewable Energy Projects



May 31, 2011

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

The U.S. Trade and Development Agency

The U.S. Trade and Development Agency helps companies create U.S. jobs through the export of U.S. goods and services for priority development projects in emerging economies. USTDA links U.S. businesses to export opportunities by funding project planning activities, pilot projects, and reverse trade missions while creating sustainable infrastructure and economic growth in partner countries.

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

EXECUTIVE SUMMARY

Mexico, a friend, neighbor, and trading partner of the United States, is changing its planning process to depend less on fossil fuels, and more on renewable energy for electricity generation. Mexico has a population of over 112 million with a GDP of $1.467 trillion dollars, the 12th largest economy in the world.

Mexico now has a petroleum-based economy: its generating capacity is now fired primarily by oil (60%) or natural gas (25%). However, oil and gas production is decreasing and Mexico must develop other energy sources. As alternatives, the national utility company, Comisión Federal de Electricidad, or CFE, is planning new coal and nuclear plants as well as renewable energy projects. CFE and the government have also begun to encourage Independent Power Producers, IPPs, in renewable energy.

The nation has set an ambitious goal of 15% renewable energy by 2020. This goal is certainly attainable, and it can be exceeded in some scenarios. Mexico has huge undeveloped resources for wind, geothermal, solar, and biomass energy.

USTDA desires to find ways to provide assistance to specific renewable energy project opportunities that serve the energy needs of Mexico, that have potential to use U.S. vendors and services, and that qualify for USTDA assistance. Assistance may take the form of feasibility studies to support international bidding and financing, technical assistance and capacity development to improve the enabling environment, or assistance arranging contact with U.S. vendors and financial institutions.

USTDA contracted Energy Markets Group (EMG) to complete a Definitional Mission of the Mexico electricity sector. EMG was charged to identify at least 4 energy projects for which USTDA assistance would be pivotal, valuable, and timely. EMG assembled a team of its energy experts comprised of Ahmad Ghamarian, Brenda Quiroz Maday, Michael Gembol, and James Sullivan to conduct the Mission and following analysis and reports.

During preparations and during a 2-week fact-finding visit to Mexico, June 25 to July 8, 2010, EMG held 24 meetings with individuals, corporations, and government agencies. These meetings identified 28 active projects that qualify in some respect for USTDA assistance. They represent over 1,920 MW of immediate projects, with potential to be replicated or "rolled out" to over 73,000 MW, roughly the same size as Mexico's present electricity generating capacity.

In discussions with USTDA, this list was narrowed down to the 6 projects shown on the following page. Their project descriptions are attached. On further analysis, 3 projects were selected for USTDA support. For these 3 projects, EMG completed Terms of Reference to support the process by which USTDA will select vendors of the services to be supported by USTDA.

The three selected projects will provide a total of 173 MW of renewable energy generating capacity. Total capital cost of the projects is approximately $415 million. Potential value of trade with U.S. vendors is approximately $298 million. A summary table is shown on the following page.

The project selections are weighed heavily for feasibility: the Definitional Mission considered capabilities of sponsors, the policy framework of the Government of Mexico, environmental issues, and both financial and economic viability of the proposals. In each case, USTDA assistance can reduce delays, improve the focus of the project, and increase probability of successful financial closing.

Among the 24 projects not selected for USTDA assistance, there are many good, viable, and important projects. USTDA may later find resources to support some of these projects; other agencies may as well assign resources to some.

List of Abbreviations

CFE	Comisión Federal de Electricidad
DISCOs	Distribution Companies
EoI	Expression of Interest
FDI	Foreign Direct Investment
GDP	Gross Development Product
GENCO	Generation Company
GoM	Government of Mexico
GWh	Giga Watt hour
IPP	Independent Power Producer
kV	KiloVolt
kW	Kilowatt (standard unit for electrical power)
kWh	kilowatt hour (one thousand Watt hours) (standard unit for electric energy)
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MMCFD	Million Cubic Feet per Day
MTDF	Medium Term Development Framework
MTOE	Million metric Tons Oil Equivalent
MW	Megawatt (one million Watt hours)
PPA	Power Purchase Agreement
PV	Photovoltaic
TCF	Trillion Cubic Feet
TOE	Tons of Oil Equivalent
TWh	Terawatt-hour (one trillion Watt hours)
USAID	United States Agency for International Development
USTDA	United States Trade and Development Agency
WVO	Waste Vegetable Oil

1.0 PROJECT DESCRIPTION: DEFINITIONAL MISSION FOR MEXICO RENEWABLE ENERGY PROJECTS

On March 23, 2010, USTDA awarded a contract to EMG to perform a Definitional Mission for Mexico Renewable Energy Projects. The objective of the DM is to review and assess the current electricity industry of Mexico and identify and develop the TOR for USTDA funding consideration for at least four feasibility studies, technical assistance or other capacity building projects which would help Mexico develop its renewable energy resources.

EMG formed a team for the project consisting of Ahmad Ghamarian, team leader; Brenda Quiroz Maday, country energy expert; Michael Gembol, project development specialist; and James Sullivan, development specialist.

USTDA provided a briefing to clarify the Scope of Work and provided current information on known projects. They emphasized renewable energy projects such as wind, biomass, solar, geothermal, and hydro. Viable possibilities might include new plants or repowering existing fossil-fueled plants to use renewable fuels. Capacity building might be included, along with Technical Assistance if it is an instrument for enabling project execution such as advisory services for Power Purchase Agreement negotiation and Financial Package structuring. USTDA requested the DM Team to explore projects for potential cost sharing and coordination with other agencies such as USAID. The studies and/or technical assistance activities recommended by EMG should target the substantial implementation financing from OPIC and U.S. Ex-Im Bank as well as multilaterals such as the World Bank and IDB. USTDA prefers that the nominated projects be from the private sector but will accept projects sponsored by CFE or municipalities. USTDA provided relevant background information and extracts from specific project documents.

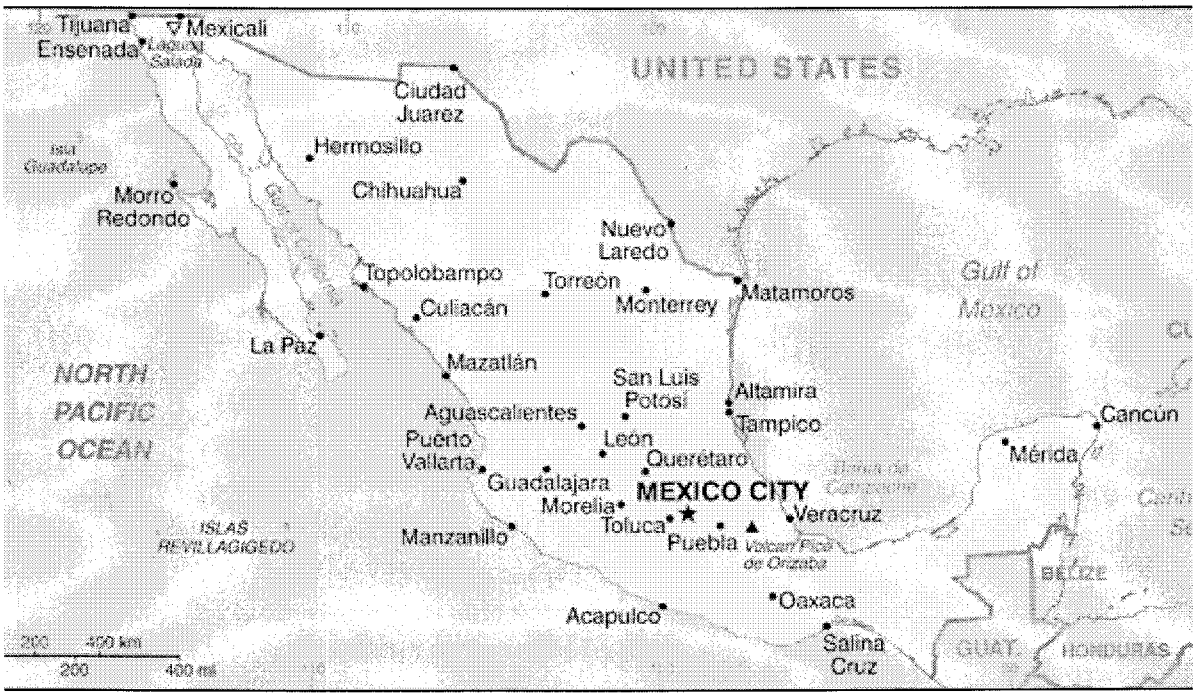
In preparation, EMG initiated a series of meetings with knowledgeable and interested U.S. parties, including USAID and DOE. These led to arrangements for follow-on meetings with their field offices and counterparts in Mexico.

With the help of USTDA and the U.S. parties, and using EMG's own resources in the industry and within Mexico, EMG prepared a detailed itinerary and schedule of meetings for a 2-week visit, proceeding to Mexico City, Guadalajara, Zacatecas, and Tijuana, concluding the trip in San Diego. EMG arranged meetings with Mexico government agencies and officials and private sector managers.

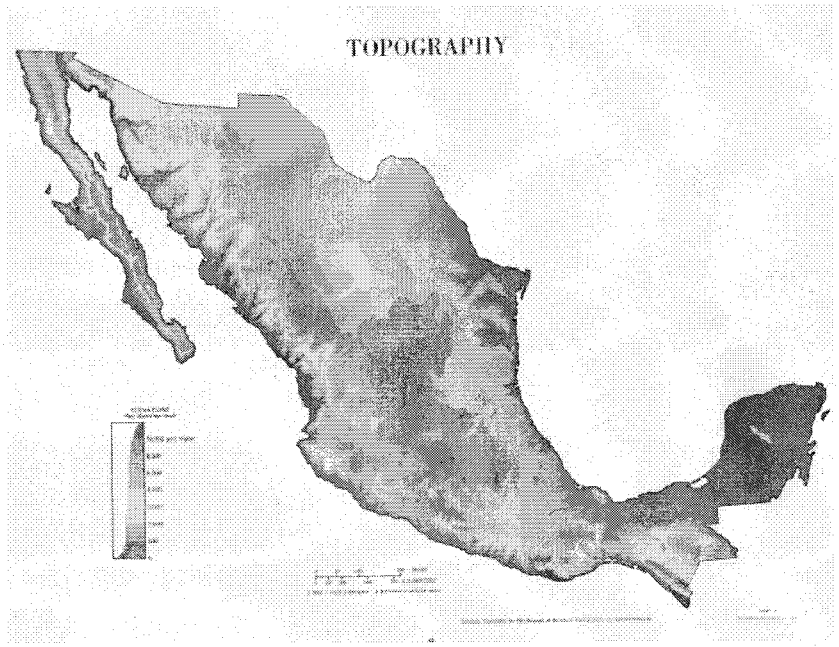
To introduce the Definitional Mission to counterparts, EMG prepared a Letter of Introduction describing the DM and requesting specific information on projects they may propose.

2.0 MEXICO'S GEOGRAPHY AND ECONOMY

Geography: Mexico is contiguous with the U.S., sharing a 1,969-mile border. It also borders Belize (251 miles) and Guatemala (541 miles).



The dominant feature of Mexico's topography is a central plateau rising to over 6000 feet in the south at Mexico City. Due to the high elevation, temperatures are stable in the 70's year round at the most heavily populated urban area around the nation's capital. As a result, there is very little air conditioning or heating required for much of Mexico's service territory, and only the extreme northern and southern areas, Baja California, and the coasts experience strong daily peaks.



Economy: Mexico's total population in July, 2010, is estimated at 112.5 million, 11th largest in the world, with about 77% of its population living in urban areas. Population growth rate was estimated at 1.118% per annum. Mexico has a relatively young population, with a median age of 26.7.

The total GDP of Mexico during 2009 was $1.482 trillion. It fell 9% in 2009, but is expected to resume positive growth in 2010. The contribution to GDP from the agricultural sector was 4.3%; from the industrial sector, 32.9%; and 62.8% from service sectors. Per capita income is $13,500, but income distribution is unequal.

Mexico's economy is increasingly dominated by the private sector. An energy reform bill was passed in 2008. Regulatory policy changes over the course of 2010 provide strong incentives for Independent Power Producers, private ownership, cogeneration, and renewable energy projects.

Significant to note, Mexico has considerable public and private wealth. Under the right circumstances, there is no shortage of investment funds for worthy infrastructure projects. There is, however, a shortage of the human infrastructure necessary to effect successful renewable energy projects: entrepreneurs, developers, energy engineers, progressive financial institutions, and environmentally aware citizens.

3.0 ENERGY SECTOR OF MEXICO

In Mexico, generation, transmission, supply, and distribution of the electricity system are state monopolies. Prior to October 2009, there were two government companies responsible for these functions: the Federal Electricity Board (CFE) and Central Power and Light (LFC). CFE was responsible for 80% of the national electricity system and LFC served the central region of the country and was responsible for 20% of it power distribution. At the end of 2009, Mexico's president, Felipe Calderon, issued an executive order to stop LFC's operations and its services were taken over by CFE. The Mexican electrical system is coordinated by the Secretary for Energy (SENER), the Regulatory Board for Energy (CRE), and the National Board for the Efficient Use of Energy (CONUEE). SENER is in charge of coordinating the national energy policy. The function of CRE is to regulate private participation in the electrical and natural gas sectors. CONUEE has the goal of fostering energy saving and efficiency and of promoting renewable energies.

Changes to Mexican law in 1992 opened the generation sector to private participation. Any company seeking to establish private electricity generating capacity or to begin importing/exporting electric power must attain a permit from CRE. By 2008, private generators held about 22,700 megawatts (MW) of generating capacity, mostly consisting of combined-cycle, gas-fired turbines (CCGT). CFE also operates Mexico's national transmission grid, which consists of 27,000 miles of high voltage lines, 28,000 miles of medium voltage lines, and 370,000 miles of low voltage distribution lines. According to CFE, the infrastructure to generate electric power is made up of 177 generating plants having an installed capacity of 50,238 megawatts (MW). 22.81% of CFE's installed capacity stems from 21 plants that were built using private capital by Independent Power Producers (IPP).

Although the amendment to allow IPPs was passed in 1992, the first IPP permit was not awarded until 1997, when the U.S. energy company AES won a contract to build, own, and operate the 532-MW Merida III plant. The IPP model was provided a fresh impetus in 2001 by President Vicente Fox of the Partido Acción Nacional. As of December 2009, IPPs operated around 11,450 MW of capacity at 22 plants, and 2009 was the first year in which private investment in energy exceeded public investment.

Different market configuration, regulation, infrastructure, and technology, combined with different cultural, operational, financial, and environmental conditions add levels of complexity towards achieving interconnected markets between Mexico and the United States.

3.1 ENERGY SUPPLY AND CONSUMPTION

3.1.1 Growth Scenarios

As mentioned in the section on Mexico's geography, the mild climate of central Mexico results in fairly low heating and air conditioning demand across the most heavily populated urban areas. Residential power consumption is modest. Consequently, despite strong economic growth and increasing affluence, CFE's demand growth scenarios are modest, at only 2.5-4.8% per year.

CFE Una empresa de clase mundial Subdirección de Desarrollo de Proyectos

Growth scenarios

National GDP (%)	Scenario		
	Low	Medium	High
Estimate 2007-2017	2.6	3.6	4.3
Estimate 2008-2018*	1.8	2.3	3.5

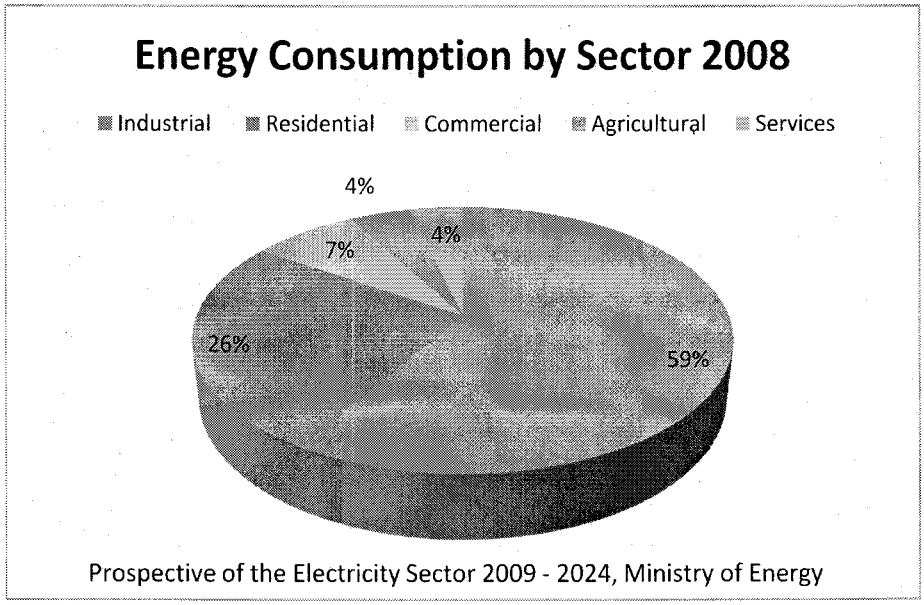
** For the base scenario the 2008 and 2009 GDP growth is 2% and 1.8%, respectively.*

Electrical Power Consumption (%)	Scenario		
	Low	Medium	High
Estimate 2007-2017	3.6	4.8	5.4
Estimate 2008-2018	2.5	3.3	4.8

Works and Infrastructure Program of the Electrical Sector = *Programa de Obras e Inversiones del Sector Eléctrico 2009-2018*

3.1.2 Energy Consumption by Sector

The other major effect of climate is that the industrial sector dominates energy consumption, with 59% of the total demand. This is significant in several respects. The industrial sector, more than any other sector, has the technical and financial capability to participate in cogeneration and energy efficiency projects, depending on their process requirements. The sector has room to improve its energy utilization if circumstances compel it to improve. Second, the industrial sector is able to participate heavily in self-supply renewable energy projects, especially those that involve wheeling resources through CFE transmission systems at the new rate of 3 cents/kwh (about 2.5 cent/kwh) for high tension customers. Note that, theoretically, a plant in northern Mexico could wheel power to its parent company in southern Mexico at considerably less than the cost of transmission losses. Finally, there has been a very large unaccounted loss of power in serving industrial customers, and programs to correct this problem may improve the financial condition of CFE and provide additional incentive for energy efficiency, cogeneration, and renewable self-supply projects.



Primary energy supply (ktoe)		Final energy consumption (ktoe)		Power generation (GWh)	
Indigenous production	251 288	Industry sector	32 704	Total	230 927
Net imports and other	–76 774	Transport sector	51 554	Thermal	185 812
Total PES	173 257	Other sectors	31 096	Hydro	27 042
Coal	9 121	Total FEC	115 355	Nuclear	10 421
Oil	76 279	Coal	1 106	Geothermal	7 404
Gas	68 659	Oil	75 985	Other	248
Hydro power	6 405	Gas	13 398		
Nuclear power	2 734	Electricity and other	23 759		
Geothermal	1 753				
Other	8 304				

Source: Balance Nacional de Energía 2008, Sener, Mexico (www.energia.gob.mx), and Energy and Data Modelling Centre, Institute of Energy Economics, Japan (2009) (www.ieej.or.jp/egeda/database/database-top.html).

3.1.3 Ownership of Generating Capacity

Total installed capacity in 2010 will exceed 60,000 MW. This estimate is approximate because it may include plants with permits but not yet in service.

Ownership	Number of permits	Total capacity (MW)	Percentage of total national capacity (%)
CFE		37,831	64.5%
Independent Power Production (IPP)	22	11,447	19.5
Autogeneration	589	6,102	10.4%

Cogeneration	57	3,255	5.5%
Small Generation	19	3	0.005%

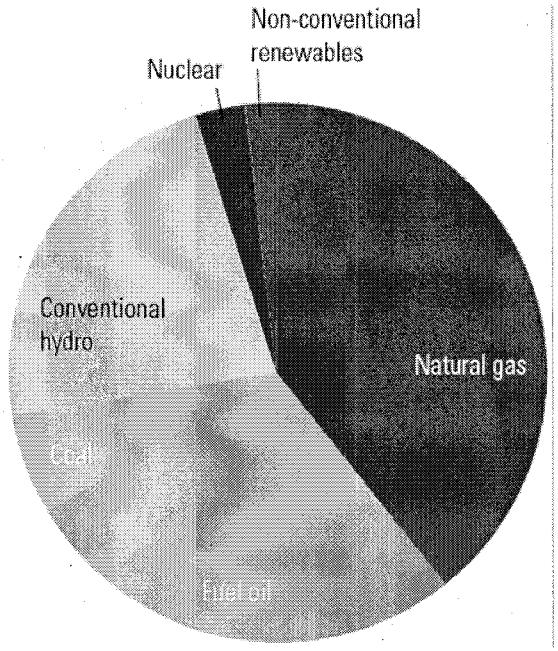
The IPP category consists of plants selling power to CFE. The category has grown rapidly since the first IPP startup in 1995. These are mostly gas-fired combined cycle plants, but they include a growing block of wind generation.

As discussed in Section 3.7, CRE is changing regulatory policies to promote renewable energy and qualifying, efficient cogeneration. These incentives are expected to greatly increase the autogeneration, cogeneration, and small generation categories in the future.

3.2 CONVENTIONAL GENERATING CAPACITY

3.2.1 Oil and Gas-Fueled Generating Capacity

Mexico's domestic resources of oil and natural gas are in decline and the transportation sector now consumes all available oil production and imports more.



Many oil-fired plants have been converted to natural gas. Two LNG import terminals are in service, a third is under construction, and three more are planned on the Pacific Coast. CFE's POISE resource plan restricts the use of natural gas to no more than 40% of total capacity.

3.2.2 Coal-Fueled Generating Capacity

Mexico has no significant coal reserves; coal is imported from South American and Australia. Coal-fired generating stations now represent only 7.31% of CFE's generating mix, equivalent to 2,600 MW installed capacity from 8 generation units located in Nava Coahuila. However, CFE plans to add 1,961 MW of coal generation over the next 10 years, increasing to over 9% of the total.

3.3.3 Nuclear Generating Capacity

Mexico has one operating nuclear station, CFE's two-unit Laguna Verde, on the east coast. Originally designed for 1365 MW, it is being upgraded another 255 MW in 2010.
CFE is evaluating options to build new nuclear plants in the face of declining oil and gas availability; estimates range from 6 years to 20 years for the approvals, financing, and construction time. The decision to build nuclear plants is being driven both by the need to import fossil fuels and by environmental concerns.

Nuclear is not a preferred option due to its long lead times, high capital expense, waste disposal problem, and safety concerns. The CRE has set regulatory incentives for renewable energy projects partly in hope that successful development of Mexico's enormous renewable energy reserves can forestall commitments to nuclear power.

3.3 RENEWABLE ENERGY

Renewable energy in Mexico is provided by hydro, geothermal, wind, nuclear, and biomass (sugarcane and wood). Natural resources such as hydro, geothermal, wind, and nuclear are used for electricity generation, while biomass is used for heating purposes. The total installed capacity of renewables was 13,750 MW in 2008, the same as in 2007. Of the total installed renewable capacity, hydro made up 82.4% (SENER 2008a).

3.3.1 Mexico's Renewable Energy Goals

In November 2008, Mexico's Secretaria de Energia (SENER), published the Law for the Use of Renewable Energy and Financing Energy Transition, followed by regulation and implementation programs. Of particular interest is the Special Program for the Use of Renewable Energy that establishes specific renewable energy targets as follows:

Mexico: Renewable Energy Goals Indicator	Goal	Targeted Year	Status (2008)
Installed renewable electricity capacity	7.6 %	2012	3.3 %
Power Generated by Renewable Sources	4.5 – 6.6 %	2012	3.9 %

3.3.2 United States Renewable Energy Goals

Mexico's use of renewable energy is closely tied to renewable energy issues in the United States. According to the Federal Energy Regulatory Commission, 30 states have adopted

Renewable Energy Portfolio Standards (RPS), including all the bordering states: California, Arizona, New Mexico, and Texas.

Renewable Energy Portfolio Standards Set by Contiguous U.S. States

State	Targeted Power Generated from Renewable Sources	Targeted Year	Status (2009)
Arizona	15%	2025	10.73%
California	33%	2020	24.71%
New Mexico	20%	2020	8.58%
Texas	5,880 MW (10 – 14%)	2015	10.05%

Source: Status: EIA - State Total Electric Power Industry Net Summer Capacity

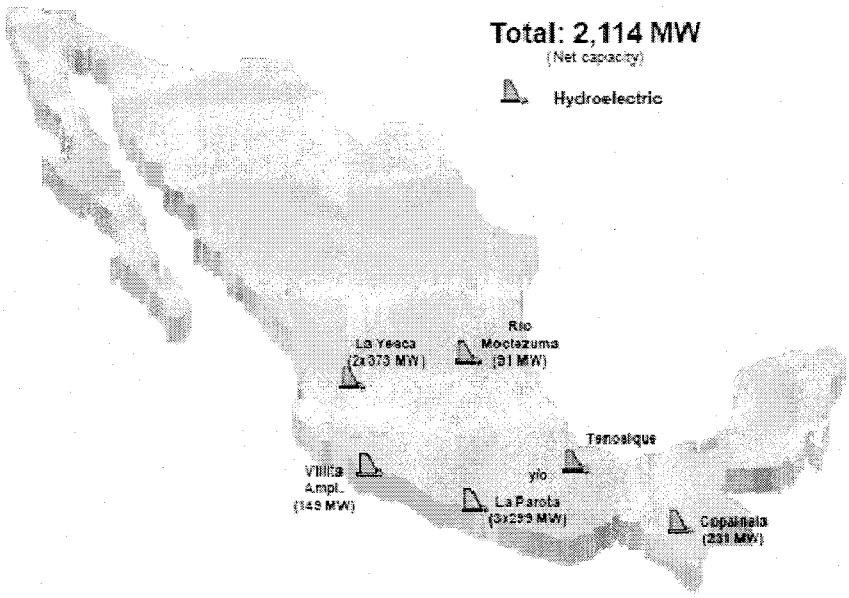
These strong commitments are significant to Mexico because the U.S. states have comparatively greater difficulty obtaining permits for new power plant and transmission line projects, and it is apparent that some states, particularly California, will not meet their commitments with new generating capacity sited within their own borders. (See note on comparative wind resources in Baja California, Sierra Juarez.) Mexico's great areas of undeveloped land, reserves of low-cost labor, and enormous renewable resources offer opportunities for developers trying to meet U.S. commitments.

3.3.3 Large Hydroelectric

Southern Mexico has very strong large hydroelectric resources, generating 20% of Mexico's overall energy supply. These dams provide most of the flexible peak capacity of the Mexican power system, as well as large amounts of inexpensive baseload capacity. Since they provide so much peaking capacity, the hydro dams produce only about 16.6% of the total generation. Peaking is an important function, as it relieves the fossil-fueled units of the need to absorb peaks and operate at reduced, inefficient load levels. Mexico's hydro resource is so strong that

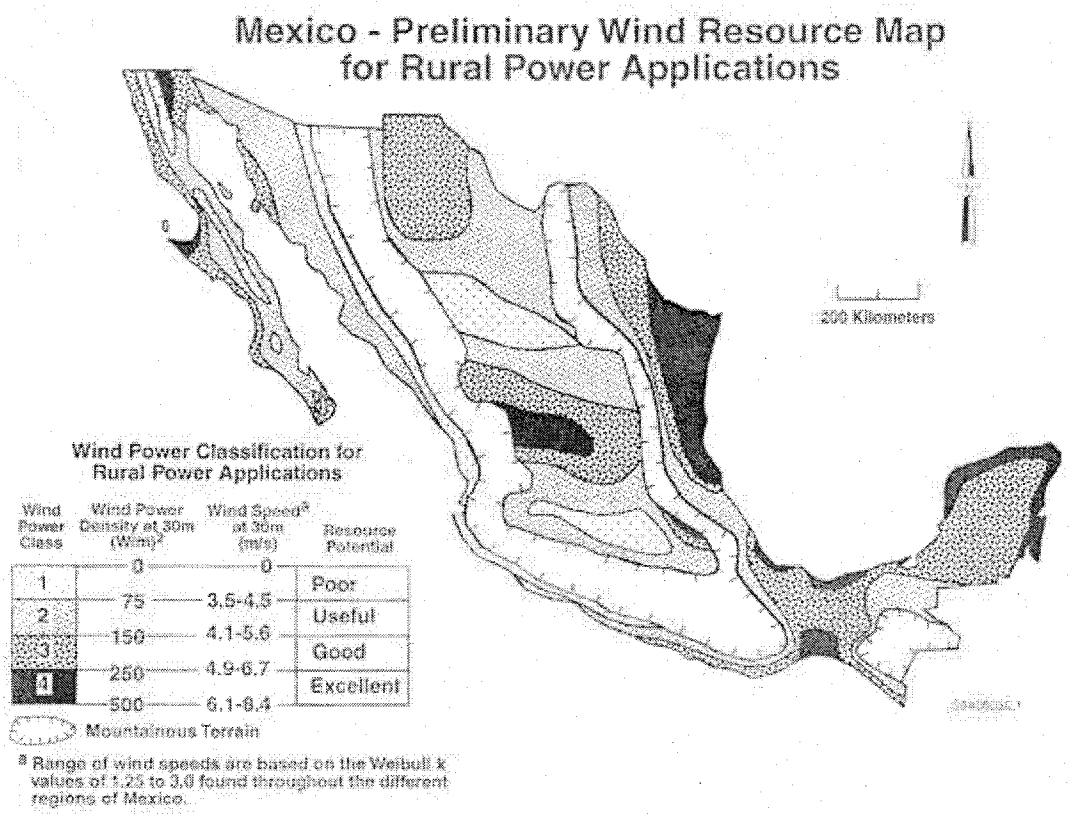
CFE has built transmission lines to interchange power, mostly surplus hydro power, with neighboring Guatemala.
CFE plans 2,114 MW of new large hydroelectric capacity at six sites by 2018.

New Power Generation Infrastructure 2008-2018



3.3.4 Wind

Significant wind resources exist in many parts of the Mexico, with Class 4 resources in the Sierra Juarez mountains east of Tijuana, the Oaxaca area at the Isthmus of Tehuantepec (the isthmus west of Yucatan), the Caribbean coast of northern Yucatan, and the highlands around Zacatecas.



Total wind resources adequate for commercial development are estimated at 120,000 MW of electrical capacity. CFE is initiating several large wind projects, with 572 MW included in the POISE resource plan.

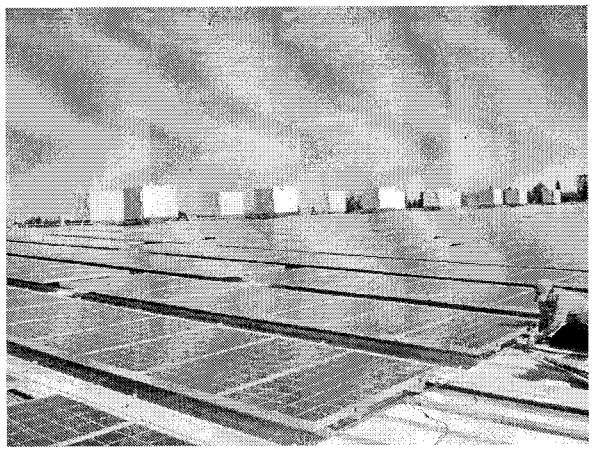
Wind Power

Project	Contract type	Range per unit capacity (MW)	Total capacity (MW)	Year
LA VENTA II	OPF	0.85	83	2006
LA VENTA III	IPP	0.85-2.5	99	2010
OAXACA I	IPP	0.85-2.5	100	2010
OAXACA II	IPP	0.85-2.5	100	2011
OAXACA III	IPP	0.85-2.5	100	2011
OAXACA IV	IPP	0.85-2.5	100	2011
		TOTAL	582	

3.3.5 Solar Energy

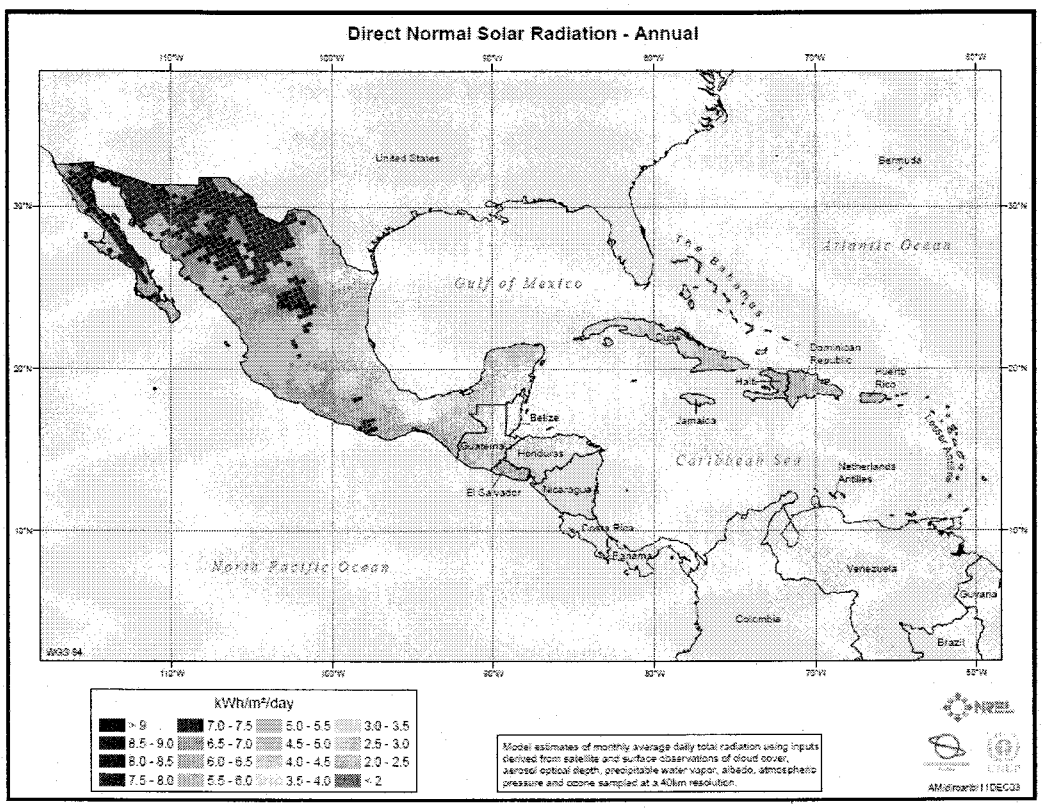
Mexico has one of the best solar resources in the world, with large areas of northern Mexico receiving 7.5-8.0 kWh/m^2/day. Cloud cover is minimal, and much of the central plateau is over 5,000 feet of elevation, reducing atmospheric absorption. Total solar resources now adequate for commercial development are estimated at 45,000 MW of electrical capacity. The average insulation of Mexico is over 5.0 kWh/m^2/day, so the total solar potential is over 50 times the present installed capacity, giving Mexico the third highest solar potential in the world.

Mexico has no grid-connected solar power plants. In 2006, the World Bank announced the funding of a $50 million grant for a Hybrid Solar Thermal Power Plant Project at Agua Prieta, in sponsored by the government of Sonora. The project will integrate a parabolic-trough solar field with a 535 MW conventional combined-cycle gas turbine capacity. The steam produced by the solar field is added to the steam produced in the heat recovery steam generators of the CCGT plant, increasing the steam turbine capacity by 12-15 MW. With this hybrid concept, the solar thermal plant does not need a complete new steam and electrical system, reducing the capital costs markedly. The project was initially approved in 1999 with the construction contract expected to be awarded in 2010.



New regulatory policies allow renewable plants to wheel power through the CFE transmission system at a very reasonable "postage stamp" rate. Theoretically, a commercial developer could install a large solar plant in northern Mexico and wheel power to its commercial facilities anywhere in Mexico. In 2009, Wal-Mart Mexico launched what was the largest solar array in Latin America at the time, a 174-kW array of solar panels on top of its roof in Aquascalientes, about 100 km south of Zacatecas and 500 km northwest of Mexico City.

Roughly 60,000 to 80,000 solar PV systems operate across rural Mexico, after the government identified the technology as one of the most cost-effective ways to provide power to rural Mexicans without access to electricity.

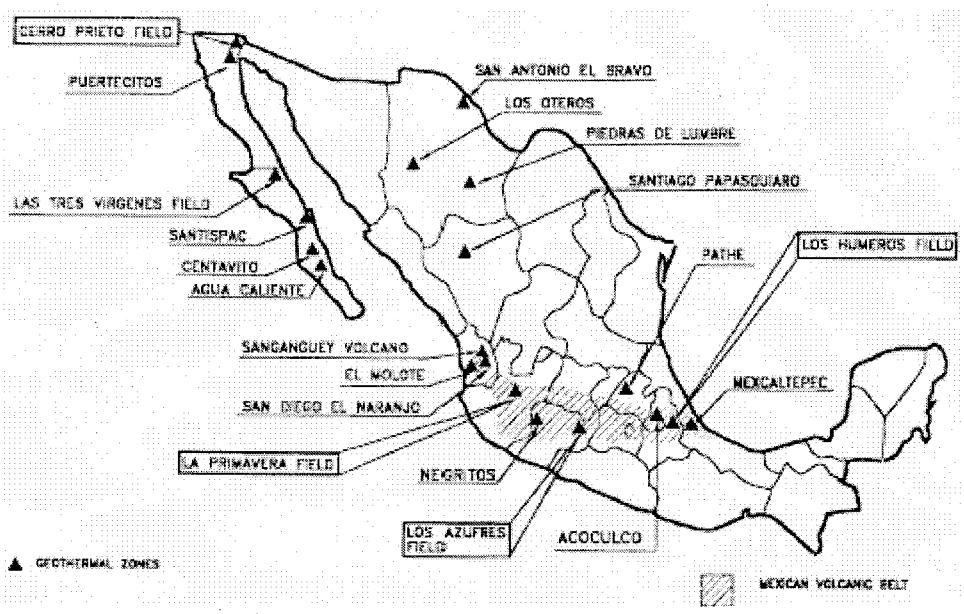


3.3.6 Small Hydroelectric

The total potential of small hydro power plants in Mexico is estimated at about 3,250 MW, including both run-of-river and irrigation canals. About 83 MW are in operation, with 105 MW under development; over 3,000 MW appears commercially feasible for development but is not yet addressed.

3.3.7 Geothermal

Mexico has about 8,000 MW of commercially viable geothermal resources for generating stations.



There are primarily 3 active sites producing electricity using geothermal resources:
Cerro Prieto – 720 MWe
Los Humeros – 42 MWe
Los Azufres – 188 MWe

These areas are divided into the volcanic belt stretching across the middle of the country and the Cerro Prieto which is part of the Imperial Valley/Salton Sea production zones working in the US today.

Currently, around 950 MWe are online producing some 6.6 GWh of electricity for Mexico, or about 3.1% of their annual electricity consumption. By the end of 2010, it is expected that an addition 220 MWe will be available (100 MW at Cerro Prieto, 45 MW at Los Humeros, and 75 MW at Cerritos Colorados.)

One difficulty pointed out to the DM is that CFE has a virtual monopoly on geothermal resources. There is no legal basis in Mexico for franchising geothermal resources. That means a developer can spend millions of dollars assessing and developing a geothermal resource, but another developer or CFE can then put in wells in adjacent area and deplete the resource. This is an unacceptable risk to most developers and investors.

Mexico also has a very large low-temperature geothermal resource suitable for ground-source heat pumps, greenhouses, fish farms, and desalination. UNAM has conducted research showing that essentially the entire eastern shore of Baja California on the Sea of Cortez has

sufficient geothermal resource to operate desalinate seawater in triple-effect evaporators. Communities down this coast have to import fresh water by barge at considerable expense. This project has been taken up by the Punta Brava Resort, now under construction near Ensenada, on the Pacific Coast, but can be replicated by hundreds of resorts and municipalities on the eastern Baja coast, as well.

Mexico also has significant geothermal resources in the form of high-temperature subsea vents, but no currently feasible or environmentally acceptable technology is available to exploit them.

3.3.8 Biomass

Biomass is an enormous, undeveloped energy resource for Mexico. Some agricultural industries use crop waste for process heat; few cogenerate electricity.

Crop Biomass

At present, no crop is grown exclusively for biomass, and there are no know industrial plants burning agricultural wastes. The one crop with the largest biomass potential appears to be agave. Agave is grown now for three purposes: tequila liquor, sisal rope fiber, and pulque, a beer-like beverage. None of these industries now uses agave waste, or agave bagasse, as fuel for process heat or cogeneration. An independent research group, the Agave Project, points out that agave can grow on arid land not suitable for other agriculture, requires no irrigation and little fertilizer, actually fixes nitrogen and beneficiates the soil, and yields as much as 7 times the yield of other crops grown for biomass energy.

Due to downturns in the tequila and sisal industries, some 95% of the existing agave cropland is lying fallow. Existing crops are not being harvested. In addition to that land, there are vast areas that could be readily converted to agave biomass agriculture. Some estimates suggest that agave biomass potential could exceed 100,000 MW, more than enough to replace all existing fossil generation and meet demand growth for the next 20 years. Agave agriculture is labor-intensive. Some sources have predicted that global climate change will cause a loss of 5 million agricultural jobs in Mexico by 2030. Agave crops could create 5 million new jobs to compensate.

Ethanol

A $231 million factory is being built in Tamaulipas to produce 150 million liters/year of transportation ethanol from sorghum; the International Development Bank is providing part of the funding.

Municipal Solid Waste

The federal government agency, SEMARNAT, is responsible for designing the Mexican technical landfill standards (NORM 083) and provides municipalities with technical assistance and resources to comply.

Another federal government agency, SEDESOL, provides technical assistance for the implementation of landfill gas recovery projects across Mexico. SEDESOL used EPA's guidelines to estimate the amount of gas that could be recovered from landfills; they soon noticed that this calculation needed to be adjusted due to the different waste composition. Mexico's waste contains a higher percentage of organic material resulting in about 30% higher gas production. They received technical assistance from the USEPA in order to adapt the model to Mexico's waste stream compositions.

The SEDESOL projects are designed for gas recovery from inception. Gathering systems are laid on long berm landfills. Initial gas collection is flared until sufficient volume is produced to support electricity generation. Then internal combustion engines of about 1 MW are installed. Gas collection increases as the landfill approaches full capacity. When landfilling stops, gas collection decays exponentially over a period of about 40 years. Where physical space allows, a second long berm may be laid out parallel to the first and continue gas supplies to the generators.

The first landfill gas recovery plant has been implemented at Monterey, where it is generating 15 MW of renewable energy. They have completed about 6, and have another 12 projects lined up as feasible projects.

SEDESOL's priorities naturally start with the largest landfills service the largest cities. The next tier of smaller cities have no landfill gas recovery projects, but the Municipality of Zacatecas has acted on its own initiative to establish a consortium with three adjacent municipalities to form a new, conforming landfill, which is funded and will start construction in 2010. Zacatecas has requested assistance from USTDA to perform a feasibility study to determine whether this smaller landfill can also generate power from landfill gas recovery. This project would provide proof of concept for dozens of medium-sized cities to produce power on a self-supply basis.

Municipal Sewage Sludge

Across Mexico, municipalities are installing sewage treatment systems. There are viable technologies for gasification or direct combustion of sewage sludge. The Economic Development Agency of Baja California expressed interest to the DM.

Animal Wastes

Manure waste from cattle farms, pig farms, and chicken ranches is another important source of energy. There are a several large cattle colonies near large cities which produce commercially exploitable cattle waste. Studies are being undertaken to prepare projects of power generation utilizing this important source of biomass.

Typical animal waste projects include modular biogas digesters providing gas to 2-MW spark ignition diesel generators. Single modules can be installed on small farms; large agricultural projects or municipal feedlots might require dozens of modules. Digester plants also produce salable fertilizer.

The University of Guadalajara expressed interest to the DM in setting up a pig farm biodigester project capable of producing 5-15 MW of power by pooling waste from several nearby pig farms and poultry ranches.

Biodiesel/Vegetable Oil

Several entrepreneurs have set up small businesses to collect waste vegetable oil (WVO) available from restaurants and hotels, etc., for processing into diesel fuel. Commercial sources generally re-use WVO until it is exhausted, too contaminated for further use, resulting in a fairly low quality biodiesel feedstock requiring extra filtration and acid neutralization. Households, however, generally dump WVO into kitchen drains after one use, where it drains into sanitary sewer systems. (By contrast, oil from automobiles generally drains into storm sewer systems.) As more Mexican municipalities install sewage treatment plants, they find that oils interfere with biological degradation of the wastes. It is possible that oil traps installed at sewage plants could collect much greater volumes of WVO than commercial sources provide.

Mexico has considerable capacity to grow biodiesel crops. Jatropha grows well there, and a native shrub, higuerilla, also produces an oil suitable for processing into biodiesel.
The DM was introduced to an entrepreneur processing WVO from restaurants in Tijuana. We explored the possibility of setting up a biodiesel treatment facility with modern tankage, pumps, instrumentation, and handling systems, and with capacity to process waste oil from a variety of sources, including restaurant WVO, WVO collected in sewage system oil traps, and various biodiesel crops. The facility could engage regular laborers and analysts, maintain a vehicle fleet for collections, establish a biodiesel filling station, negotiate favorable terms for bulk consumables, and lease processing time to several entrepreneurs. The concept is promising and may be referred to other assistance organizations.

3.3.9 Other Renewable Energy Sources

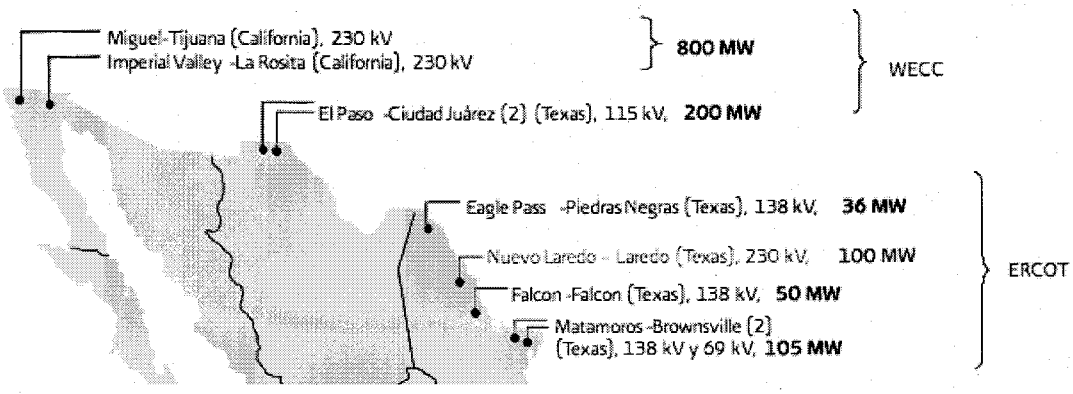
UNAM has performed studies and developed designs showing the feasibility of installing ocean current generators in the relatively narrow straits between Yucatan and Cuba. The resource is enormous; the technical difficulty is in anchoring and collecting power from large numbers of water turbines, then transmitting the power significant distances to shore-based substations. In a situation where there is still a large undeveloped hydroelectric resource in Yucatan, the ocean current concept is not likely to be competitive.

UNAM has also studied the concept of installing retention dams across bays in the northern extremes of the Sea of Cortez, which have a high tidal range. The environmental implications are very challenging, probably prohibitive, as the shallows of the Sea of Cortez are one of the most prolific breeding grounds in the world for fish, whales, and other sealife.

3.4 CROSS-BORDER POWER INTERCONNECTIONS AND COMMERCE

There are nine power interconnections between the U.S. and Mexico shown in the following map. Each one of them varies in terms of its voltage and load capacity. Five of those interconnections (ERCOT) operate only in emergency situations.

Electric Interconnections in the Border Region, 2008



Source: Adapted from: "Perspectiva del Sector Electrico 2009 - 2024 ," SENER 2010

Electricity commercialization between the U.S. and Mexico is more active between the California - Baja California region, with 1,537 GWh traded between the regions.

Table V. Electric Trade (GWh), 1998 - 2008

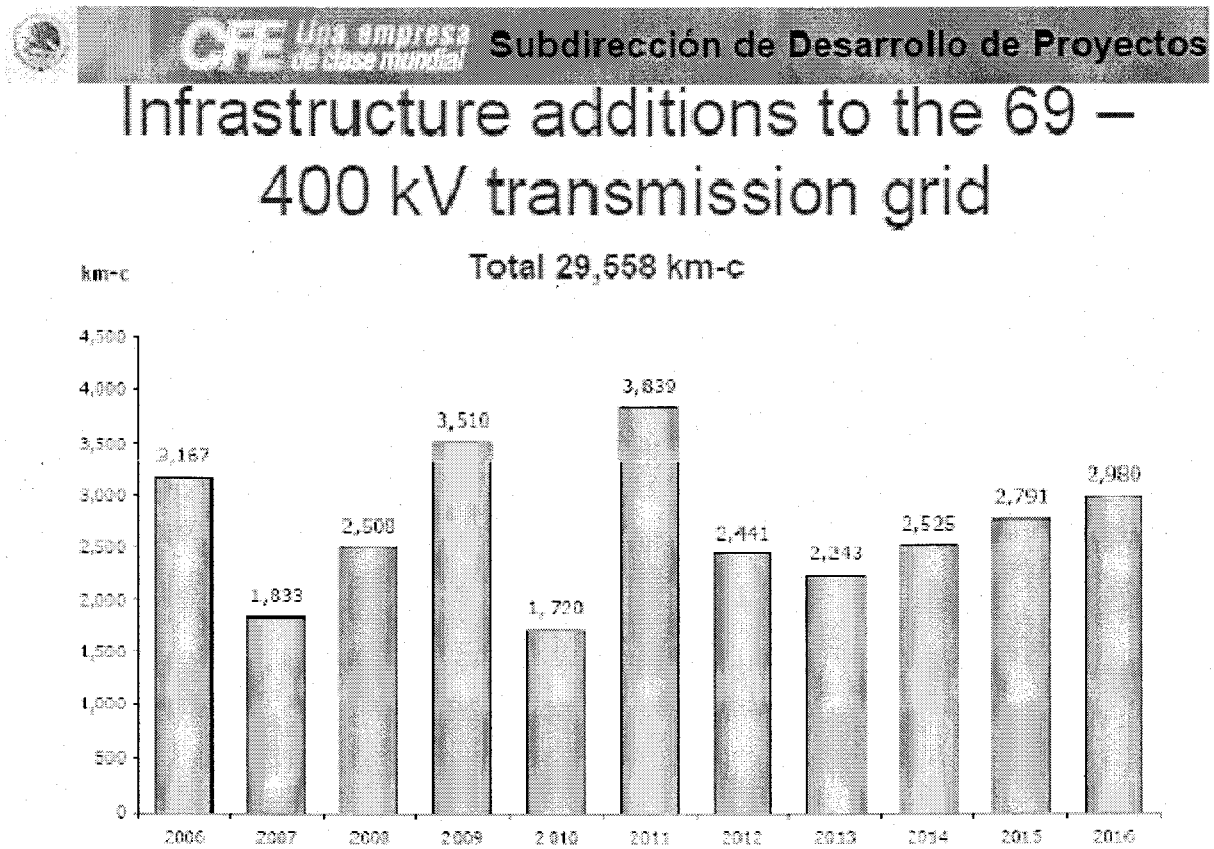
Entidad federativa	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Exportaciones											
Chiapas[1]	-	-	-	-	-	-	-	1	2	2	3
Baja California[2]	45	31	66	112	164	765	770	1,037	1,072	1,211	1,197
Tamaulipas[3]	-	-	2	1	-	-	-	-	16	13	4
Quintana Roo[4]	31	100	127	158	180	188	236	253	209	225	248
Total	**76**	**131**	**195**	**271**	**344**	**953**	**1,006**	**1,291**	**1,299**	**1,451**	**1,452**
Importaciones											
Baja California[2]	480	646	927	82	311	45	39	75	514	266	340
Sonora[5]	3	4	4	4	5	5	6	6	6	6	6
Chihuahua[6]	1,022	7	129	235	189	21	2	6	3	3	3
Tamaulipas[3]	2	2	9	6	26	-	-	-	1	3	3
Total	**1,507**	**659**	**1,069**	**327**	**531**	**71**	**47**	**87**	**523**	**277**	**351**
Balance neto exportación-importación	-1,431	-528	-874	-56	-187	882	959	1,204	776	1,174	1,102

[1] Guatemala.
[2] Coral Power L. L. C., San Diego Gas & Electric y Sempra Energy Solutions.
[3] Central Power & Light (CPL) (EUA).
[4] Belize Electricity Board (Belice).
[5] Sasabe Trico Electric Cooperative y Santa Cruz (UNS Electric) (EUA).
[6] Rio Grande Cooperative Inc. y American Electric Power (EUA).
Fuente: CFE.

Source: "Perspectiva del Sector Electrico 2009 - 2024 ," SENER 2010

3.5 TRANSMISSION

CFE plans an average of 3,000 km of transmission lines per year to handle new plant capacity and changes in urban demand patterns. Specific projects in southern Mexico support a large number of wind projects planned in Oaxaca.



3.6 DISTRIBUTION

CFE is in the process of taking over the distribution system of Mexico City, which was in disrepair and burdened with high technical and non-technical losses. Rebuilding the Mexico City grid is an opportunity to incorporate Smart Grid features, but this is not now CFE's main priority.

It will also spend over 3 billion pesos per year in routine maintenance and expansion of distribution systems.

3.7 REGULATION

CRE has 7 regulators, each serving a 5-year term. One regulator must change every year. The commission is relatively independent, but has not yet assumed tariff authority, which is still held by SENER. CRE is preparing by performing cost of service studies to rationalize tariffs.

The Regulatory Commission is concerned by climate change, supportive of renewable energy projects, and pushing for favorable environmental legislation. Under present law, they do have

some flexibility in setting favorable tariffs for renewable energy projects if CFE initiates a request, as in a pilot project for a new technology.

CRE is changing regulatory policies to promote efficient cogeneration and for renewables. For cogeneration, there will be efficiency and minimum process steam requirements, similar to the EU's policy (which derives from the U.S. PURPA.)

They are trying to support both the public utilities and the local self-supply generation projects, which is a balancing act. Wind projects can now sell to the CFE grid at local TOU retail tariffs, and power from intermittent sources can be banked on the grid. They expect to have a capacity tariff by EOY 2010 for 90% of avoided cost. One very favorable feature for wind is the ability to use monthly average output in determining demand charges for self-supply ventures, instead of using the minimum, which is usually zero for a wind plant.

CRE has put in place a postage stamp rate for renewables: they can now wheel power to other users, their own facilities, or even foreign purchasers from anywhere in Mexico for a reasonable fixed fee. The fee is 0.03 pesos (about 0.25 U.S. cents) for customers at transmission voltage, another 0.06 pesos for medium-voltage customers, and another 0.06 pesos for residential voltage. That totals about one U.S. cent, illustrating that a wind project could interconnect to CFE and use the existing distribution systems to supply power to industrial, commercial, and residential consumers.

Small solar PV installations like homes can run their meters backwards, exporting power to the grid, and thereby reduce their energy and demand charges, but they cannot receive payment for excess generation. Central Mexico, being on a high plateau, has very little daily or seasonal temperature variation, but Mexicali, for example, in Baja California, has a high daily air conditioning peak, and CRE is encouraging customers to put in solar PV up to ½ kw.

The National Plan calls for 30% "clean energy" by 2025. Renewables have these options:
1. CFE can competitively bid on energy cost and capacity charge basis with no size limit.
2. For IPP renewables up to 30 MW and for cogen up to 20 MW, CFE will pay only energy cost, not capacity charge. However, CFE is expecting to implement a full avoided cost capacity charge.
3. If CFE needs an incentive tariff on a case basis, CFE can issue a special tariff on an ROE basis.
CRE is concerned that CFE has dwindling gas supplies. No new oil plants will be permitted, so they must turn to renewable, coal, or nuclear. There are two operating LNG terminals, each with 500 mmcf/day capacity, and a 1 bcf/day plant is under construction in Ensenada.

Domestic tariffs are very high, but often not paid. Small commercial customers receive about 6-7 billion pesos subsidy, and there is a big subsidy for large agriculture. There is a huge amount of non-payment in Mexico City and Acapulco. CFE has now taken over the Mexico City franchise area and is cleaning up the payments and theft problems. 59% of Mexico's power production is for industrial customers, and there is massive theft in that sector.

CFE has de facto monopoly power on geothermal. There is no franchise protection for resources. It takes a lot of time and money to develop an underground resource, and a competitor can then come in and build a plant that takes away some of the heat, depleting the resource. The risk is too high for a private developer.

CRE is concerned that most developers still do not know the present tariff options for renewables, and more improvements are in process.

3.8 GENERATION PLANNING

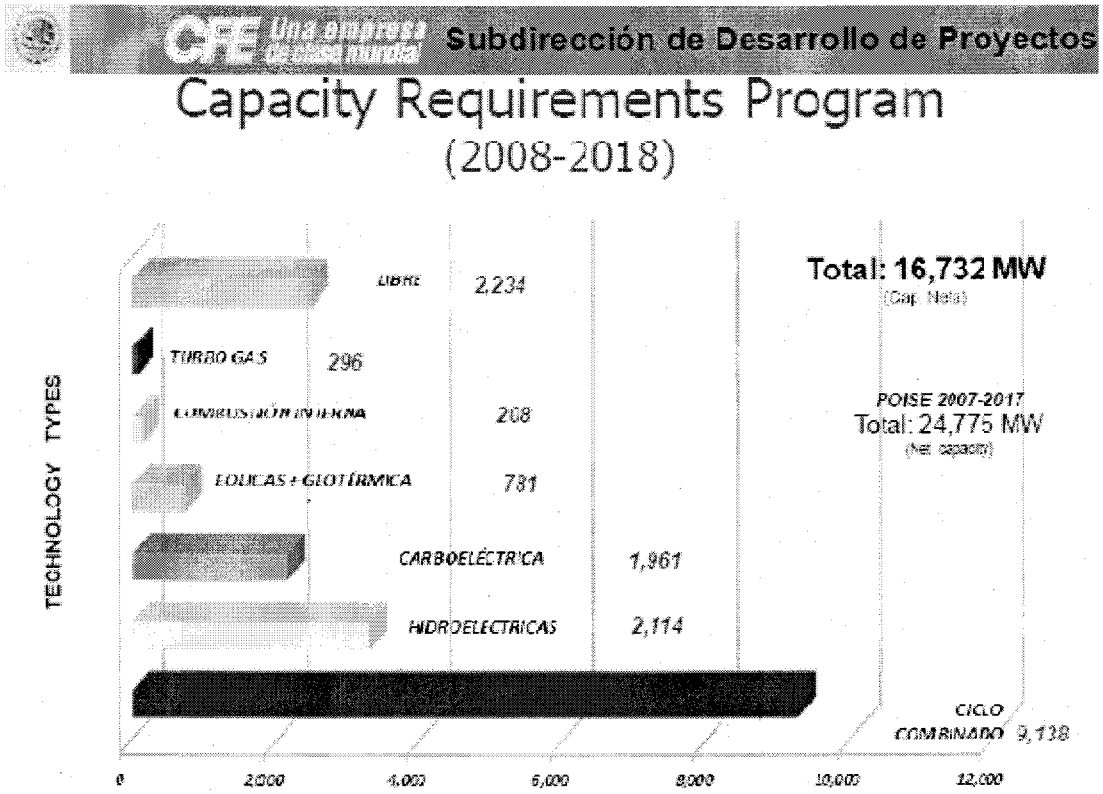
CFE's POISE Resource Plan, 2008-2018, is summarized:

1. In order to meet the next ten years' electricity demand, CFE plants to install over 17,000 MW of new capacity.

2. Energy source diversity is desired. The POISE 2008-2018 will try to restrict the use of natural gas to only 40% of the electrical capacity, seeking to encourage the energy source diversity and renewable energy projects.

3. The generating power capacity to be installed in this period will be:

9,138 MW of gas-fired combined cycle
2,114 MW hydroelectric plants
1,961 MW coal plants
781 MW wind power and geothermal plants
2,234 MW technology to be defined on trends



3.9 ISSUES

Some issues have been briefly discussed in the foregoing description of the energy sector. Following is the summary of major issues confronting the sector.

3.9.1 Cross-Border Interconnection with the U.S.

On the Mexican side, CFE and the SENER have concentrated decision authority, with only a few major parties involved in the process. Across the border, in the U.S., their direct counterparts are not necessarily the lead parties in the decision process. Instead, there are hundreds of state and federal government agencies, individual utilities, independent power developers, industry associations, financial institutions, research groups, consumer groups, and energy market entities, all holding partial keys to the decision process.

3.9.2 Regulatory Incentives for Renewable Energy Projects

To date, there has been very little renewable project development. New regulatory policies appear to be very favorable to industrial and municipal users and to independent power developers. CRE expects that policies recently promulgated and new policies due for release

before the end of 2010 will create great numbers of financially viable projects. The issue may be that a great numbers of independent projects could cause financial impacts on CFE or create chokepoints or instabilities in the transmission system.

4.0 PROJECT TERMS OF REFERENCE STUDIES

4.1 Project Selection Process

Selection criteria were determined in discussions with USTDA before the start of the Definitional Mission. The project opportunities selected by the Definitional Mission must have value in one of the following Value Criteria or in combinations, and must meet all the Compliance Criteria.

Value Criteria

A. Support renewable energy development in Mexico by increasing biomass, wind, geothermal, and solar generating capacity, or providing renewable fuel to present or future generating projects, or
B. Have potential for replication of the project concept, once demonstrated, in larger quantities, or
C. Improve the enabling environment of policy, regulation, institutional capacity, and investor confidence in order to facilitate and accelerate investment, both domestic and foreign, in the energy sector.

Compliance Criteria

A. Have minimum feasible adverse impact on the environment and on the general population of Mexico.
B. Have a high degree of certainty of completion through economic and financial and technical feasibility; reasonable cooperation of all involved parties; compliance with laws, policies and regulations governing the energy sector; and the commitment and resources of the sponsors.
C. Exhibit diversity with the intent of opening doors in many technologies, financing methods, locations, fuel types, involved industries, and agencies.
D. Have potential for greater than $10 million of U.S.-sourced equipment or services.
E. Require assistance of a nature which USTDA is able to provide: U.S. consultant services to conduct feasibility studies costing in the range of $300,000 to $1,000,000 (with cost sharing where available); Technical Assistance for analyzing specific problems or helping

to complete financing packages; or Capacity Development services to provide training to government officials.

The members of the Definitional Mission acted as a panel of experts in applying these criteria subjectively during the course of meetings with sponsors and responsible agencies. In addition to their own experience as energy professionals, they sought and applied the advice of counterparts in Mexico and in the U.S.

4.2 Project Reports Summary

The Definitional Mission met with 28 interested parties, including government agencies, private energy companies, banks and investors, vendors of equipment and services, multilateral Assistance agencies, and project sponsors. These are listed in the Final Itinerary, Appendix B. Meeting Reports are provided in Appendix C.

At most of these meetings, project opportunities were identified. Some of these were conceptual – the counterpart suggested a concept without having in mind a specific sponsor or host agency. In some cases the party was a responsible government agency with intent to implement competitive bidding to identify sponsors or vendors. And some of the parties were themselves sponsors of projects or members of the development consortium of those projects. As a result of the meetings and the development of some concepts during those meetings, the Definitional Mission identified 28 project opportunities. By the estimates of the project sponsors, supplemented by rough estimates from the Definitional Mission, these project opportunities represent about 777 MW of generating capacity (including estimates of generating capacity that could be supported by fuel supply projects.)

In exceedingly rough estimates, some of these projects would lead to extensive replication, leading eventually to a total of 60,700 MW, or almost the existing total generating capacity of Mexico.

The Definitional Mission encouraged sponsors of the most promising projects to submit *pro forma* information about those projects. The Definitional Mission identified 14 project opportunities that best conformed to the criteria of Section 4.1. These are listed in Section 4.3 below.

DEFINITIONAL MISSION STUDY

EXECUTIVE SUMMARY: The Municipality of Zacatecas (population 150,000) has approval and funding for a 25-hectare landfill to be shared with 3 adjacent municipalities, and actually sited in the contiguous state of Guadalupe. SEDESOL is developing landfills at the 18 larger cities in Mexico. The Zacatecas project is the first serving a medium-size municipality. With much greater numbers of such smaller landfills, this project can be a valuable proof of concept leading to hundreds of beneficial projects. The project has concluded agreements with all participants and is in the final stages of obtaining land-use licenses.

The landfill site is a shallow arroyo, or dry gully, located on a gentle hillside about 10 km east of the Zacatecas/Guadalupe urban area. The landfill will be built to international standards, with membrane liners and gas collection. The plan calls for 70 gas vent wells to allow methane to be flared, thereby converting it to carbon dioxide, which has much lower greenhouse effect than the methane (methane is approximately 23 times as effective as carbon dioxide at trapping thermal radiation within the earth's atmosphere.)

The proposed project is to add systems to gather the gas from the vent wells and install gas engines to generate electricity. The site may produce 1-3 MW of generating capacity, depending on rate of fill, organic content, and efficiency of collection and generation. SEDESOL has successfully used a landfill gas production model provided through technical assistance from USAID and USEPA, and Zacatecas has confirmed that model is available for this project.

Power from the plant can be sold under three options:

1. Following a model used by Nissan in Aguas Caliente, local Nissan and Chrysler parts factories can purchase the power directly and claim credit for using green energy in their production processes. The plant will interconnect to the CFE grid and wheel power the factories at the recently approved transmission tariff of 0.06 peso/kwh for high-voltage customers or 0.12 peso/kwh for medium-voltage service. These rates correspond to about 1¢/kwh and 0.5¢/kwh. This is a postage-stamp rate, so the power could theoretically be wheeled to other industrial customers anywhere in Mexico or even exported to the U.S. or Guatemala.
2. Power from the plant can be sold to the participating municipalities. The power would be wheeled to residential clients for 0.15 peso/kwh, or about 1.2¢/kwh. Under pending renewables tariff legislation, the cities would be able to "bank" unused power on the grid on a monthly basis and also to deduct the average generation from their capacity charges.
3. The city may set up an industrial park to encourage ceramic kilns and brick kilns to use clean electric furnaces.

The participating municipalities may invest their own funds or apply for federal funding. They expect the project to qualify for Clean Development Mechanism credits and to be eligible for World Bank and Inter-American Bank financing. In addition, the Municipality has a line of credit with Banobras Bank, this bank was established to provide infrastructure financing at the municipal level.

City officials recently visited a landfill gas recovery and power generating facility at Oxnard, California, and came away very interested in the capability of U.S. companies to provide equipment and technical services for the project. The project might also use significant quantities of enzymes from U.S. producers to increase anaerobic (methane-producing) digestion in the landfill.

Given committed investment in the complying landfill with gas collection features, the incremental cost of electricity generation may be very attractive, especially if CDM credits, tax relief, and interconnect and wheeling charges are favorable.

The organic content of Mexican landfills tends to be very high, but this has not been fully modeled or verified, and the determination is complicated by the issue of separation and recycling. The present practice is to separate recyclable materials (glass, aluminum, copper, steel, plastics, wood, and paper) at the landfill, but large amounts of organic material may also be removed for animal feeds.

PROJECT DESCRIPTION: Zacatecas now uses two non-complying landfills that will be retired when the new landfill begins service. Neither has a drainage liner or methane collection. Trash is sorted manually by about 70 workers at the sites for recycling. [A potential micro-project would be to provide compactors and baling equipment to produce high-density bales. The trucks that transport sacks of plastic bottles burn large amounts of diesel fuel to deliver a few hundred pounds of recyclable material, deeply eroding the economics and logic of recycling. The equipment and methods could be adapted at the new landfill, as well.]

One existing landfill on the southern fringe of Zacatecas covers about 4 hectares to a depth of 80 meters, completely filling in a deep arroyo. It has been in service for decades. Severely contaminated drainage from the landfill flows down through the heart of Zacatecas, eventually finding its way to a river draining to the Gulf of Mexico. The city environmental officials are deeply concerned with the drainage. Zacatecas, it should be noted, is still an active mining city, dealing with centuries of contaminated tailings from silver mining.

The other landfill, located on the northern fringe of the Guadalupe urban area, is a 2½-hectare pyramidal berm-style landfill, also without liner or gas collection. Recycling workers evidently live in huts on the top of the landfill.

4.4.1 Feasibility Study for 1-3 MW Landfill Gas Recovery and Power Generation System

City officials recognize the severity of the problems with methane release, surface runoff, groundwater contamination, windblown trash, inefficient recycling, and social problems. They request USTDA assistance to develop retirement plans for these two landfills. The plans might include bioremediation ponds for surface runoff, other drainage treatment facilities, capping or installing a surface liner to trap and collect methane, and possibly even some generating capacity. [*The Definitional Mission speculates that, if an effective drainage treatment system could be installed, methane gas might be augmented by injecting liquid agricultural wastes, such as agave bagasse. This might extend the methane-producing life of any landfill.]*

The Definitional Mission suggests that the landfill retirement plan might be included within a Feasibility Study sponsored by USTDA for the new landfill on the logic that new facilities, with their financing capacity, should be responsible for restoration of former sites.

PRELIMINARY ANALYSIS AND SETUP: The project emerges as a technical measure aimed at solving the environmental problems generated by 578 ton/day total municipal waste from the Municipalities of Guadalupe which generates 48.5%, Vetagrande generates 1.5%, Morelos generates 1.5% and Zacatecas generates 48.5% of the waste. Legal representatives from each municipality signed an Intermunicipal Partnership Agreement to construct the landfill.

GRANTEE' S CAPABILITY AND COMMITMENT: The intermunicipal agreement identifies the Municipality of Zacatecas as the lead in the syndication of these four municipalities. The project will depend for financial strength on the public funding available through the Municipality in Zacatecas. The newly elected officials from Zacatecas have expressed support to move this project forward. The intermunicipal project group has also conducted the following studies: social, economic, and environmental impact studies. They have also obtained the following permits: use of land by the Municipality of Vetagrande, proof of urban usage by the urban development division of the State Government, satellite analysis for the selected site. A feasibility study is needed to obtain the permits to generate electricity from Mexico's Comision Federal de Electricidad (Federal Electricity Commission).

IMPLEMENTATION FINANCING:

The Contractor must provide a financing plan, including policy research to show the design qualifies for financing from parties that may include the City of Zacatecas and its investors, U.S.-Exlm, various Multilateral Agencies (MLA's) banks, the Inter-American Development Bank, Banobras, various venture capital financiers, and various domestic and international commercial banks. Contractor shall demonstrate that the financing plan meets the policies and requirements of probable lenders to the project and that the debt is within the sector limits of the lenders.

The State of Zacatecas will provide information to the Contractor to indicate funds available to the state for the project to be funded on a self-supply basis.

USTDA's grant funds shall not be used for the purchase of any equipment associated with the Project. The Grantee is responsible for identifying requesting and or securing the financing needed to implement the pilot and Project, outside of the scope of these USTDA funded Terms of Reference.

POTENTIAL OBSTACLES:

Mexico has limited borrowing capacity, especially in the capital-intensive energy sector.

U.S. EXPORT POTENTIAL:

Key technology for this project includes: a recyclable waste separation plant, biogas capture plant, thermal generation plant and miscellaneous equipment.

Typically, key plant components include a staging area for manual or mechanical separation of recyclable materials, gas collection system and backup flare, gas treatment system and an energy recovery system.

The most likely vendor of reciprocating engines include Caterpillar (USA), GE (USA), Deutz, & Waukesha.

CATEGORY	COMPANY	SPECIFIC DETAILS
Equipment	Caterpillar	Reciprocating Engine
Equipment	GE	Reciprocating Engine
Equipment	Deutz	Reciprocating Engine
Equipment	Waukesha	Reciprocating Engine

FOREIGN COMPETITION AND MARKET ENTRY ISSUES: U.S. vendors are well established in Mexican markets; it was evident during the definitional mission that Spanish companies have a strong presence in Mexico.

DEVELOPMENT IMPACT:

Primary Development Benefits

This project helps Mexico achieve its goals for renewable energy implementation and lessens its dependence on fossil fuels, which are now being imported.

Category	Explanation
Infrastructure	This project is significant because it offsets potential development of fossil fuels. With falling prices and increasing environmental pressures, this project may be a model for replication in Mexico's middle-sized municipalities and other multi-municipality modalities.
Market-Oriented Reform	This project will be an early application under the regulatory policies established to encourage industries and municipalities to provide their own power from renewable energy sources.
Human Capacity Building	The municipality of Zacatecas is progressive and environmentally sensitive, as demonstrated by its commitment to develop a conforming landfill. This project will build entrepreneurial skills among civic leaders. During construction, the project will provide approximately 80 jobs to local workers; during operation it is

	probable that local maintenance and operating crews will be employed and given training.
Technology Transfer and Productivity Improvement	This is a decidedly low-technology project comprising little more than pipes, a reciprocating engine, and an electrical generator. It is, however, a demonstration of entrepreneurial initiative that is lacking in Mexico, so potentially a very important example.
Other	The municipality of Zacatecas has recently held elections and the incoming administration has openly committed to maintain progress on the renewable energy projects already initiated by the outgoing government. This is unusual in Mexican politics, and a successful project would reward good democratic citizenship.

Alternatives:

Under the *status quo* arrangement, the municipality of Zacatecas purchases electricity from CFE at a tariff determined by the regional cost of service. This energy is a mix of various types of source energy, but is approximately 80% oil and natural gas.

IMPACT ON THE ENVIRONMENT: The proposed site is undeveloped; it is inherently difficult to site and license landfill projects. There will be major issues for drainage, odor control, transmission line corridors, control of rodents and vermin, odors and noise mitigation, heavy trucking access, and airborne debris, as well as sanitation facilities for many workers accessing the facility.

Overall, though, the environmental impact is positive, as this plant will, in effect, back down a corresponding amount of fossil-fueled generation and will also reduce emissions of a principal climate change gas, methane.

The Feasibility Study Contractor will be tasked to identify and address environmental impacts.

IMPACT ON U.S. LABOR: U.S. vendors of equipment and services are likely to win major contracts from this project. This project will increase the number of U.S. jobs in equipment fabrication, consulting, and engineering design service jobs.

The Contractor will be tasked to define the equipment components with price estimates and to identify competitive U.S. companies.

QUALIFICATIONS: ***Please refer to Section 4 of the RFP.***

JUSTIFICATION:

The Municipality of Zacatecas expressed strong commitment to reduce climate change, diversify the local economy and serve as a "proof of concept" to implement landfill gas recovery / energy generation systems in medium sized municipalities. A unique characteristic of this project is the creation of an intermunicipal agreement between four municipalities working together under the leadership of the Municipality of Zacatecas. As this type of system has not yet been implemented in a medium sized municipality in Mexico, this feasibility study will reduce the Municipality of Zacatecas's financial commitment and their risk of failure in implementing the project.

TERMS OF REFERENCE:

Please refer to Annex 5 of the RFP.

CAPITAL COSTS ESTIMATES:

A properly designed and compliant landfill gas recovery project may cost in the range of $2,500 to $3,000 per kw of generating capacity. The Zacatecas system will cost much less because the landfill and gas recovery wells are covered in the existing landfill project; only the gathering and generating system capital costs are included. However, the project is small and economy of scale will be adverse. The DM estimates the cost at $1,500 per kw, so the total project cost may be in the range of $1.5 million for a 1-MW plant and $4.5 million for a 3-MW plant, as determined by modeling performed in the Feasibility Study. Assuming the plant costs to be $3 million, roughly 25% would be EPC costs (high due to low economy of scale), and about $2 million would comprise the cost of the reciprocating engine, generator, control systems, operating station, transformer, and switchyard.

The Feasibility should require about 6 months for completion. The total cost of the Feasibility Study is estimated at $278,000.

4.1 Feasibility Study for 1-3 MW Landfill Gas Recovery and Power Generation System

STUDY COMPLETION SCHEDULE

Task Completion Schedule

Feasibility Study for Zacatecas 1-3 MW Landfill Gas Recovery Plant

TASK	Months	1	2	3	4	5	6
1.1	Inception Workshop						
1.2	Inception Report						
2.1	Review Existing Documentation						
2.2	Conduct Field Assessments						
2.3	Waste Sampling						
3	Preliminary Conceptual Design						
4.1	Investment Costs						
4.2	Operations and Maintenance Costs						
4.3	Tariff Requirement						
5	Economic Analysis						
6	Financing Plan						
7	Environmental Analysis						
8.1	Permits						
8.2	Tariff Filing						
9	Developmental Impact Assessment						
10	U.S. Sources of Supply						
11	Implementation Plan						
12	Final Report to Grantee and USTDA						

ANNEX 3

USTDA NATIONALITY REQUIREMENTS

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

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

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

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

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

NATIONALITY:

1) Rule

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

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

2) Application

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

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

3) Definitions

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

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

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

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

SOURCE AND ORIGIN:

1) Rule

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

2) Application

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

3) Definitions

"Source" means the country from which shipment is made.

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

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

ANNEX 4

USTDA GRANT AGREEMENT, INCLUDING MANDATORY CONTRACT CLAUSES

Mexico 2011-51022A

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U.S. TRADE AND DEVELOPMENT AGENCY

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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 Municipal Government of Zacatecas (Gobierno Municipal de Zacatecas) ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Grant Agreement US$278,000 ("USTDA Grant") to fund the cost of goods and services required for the preparation of a feasibility study ("Study") on the proposed Zacatecas Landfill Gas Pilot project ("Project") in Mexico ("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 shall also be included in the Contract.

3. Standards of Conduct

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

4. Grantee Responsibilities

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

5. USTDA as Financier

(A) USTDA Approval of Competitive Selection Procedures

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

(B) USTDA Approval of Contractor Selection

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

(C) USTDA Approval of Contract Between Grantee and Contractor

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

(D) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the Contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report (as defined in Clause I of Annex II), 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 be controlling.

6. Disbursement Procedures

(A) USTDA Approval of Contract Required

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Contract.

(B) Contractor Invoice Requirements

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

7. Effective Date

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

8. Study Schedule

(A) Study Completion Date

The completion date for the Study, which is December 31, 2012, is the date by which the parties estimate that the Study will have been completed.

(B) Time Limitation on Disbursement of USTDA Grant Funds

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

9. USTDA Mandatory Clauses

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

10. Use of U.S. Carriers

(A) Air

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

(B) Marine

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

11. Nationality, Source, and Origin

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

12. Taxes

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

13. Cooperation Between Parties and Follow-Up

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report, the Grantee agrees to respond to any reasonable inquiries from USTDA about the status or results of the Project, and upon receipt by the Grantee of the Final Report, will designate (by both title and organization) a point of contact for any such inquiries.

14. Implementation Letters

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

15. Recordkeeping and Audit

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

16. Representation of Parties

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

17. Addresses of Record for Parties

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

To: Municipal President
Gobierno Municipal de Zacatecas
Calzada Héroes de Chapultepec 1110
Colonia Lázaro Cárdenas, C. P. 98040
Municipio de Zacatecas, Zacatecas
MEXICO

Phone: + (52-492) 923-9421
Fax: + (52-492) 923-9421 ext. 1609

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

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

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

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

Appropriation No.:	1111/121001
Activity No.:	2011-51022A
Reservation No.:	2011204
Grant No.:	GH201151204

18. Termination

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

19. Non-waiver of Rights and Remedies

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

20. U.S. Technology and Equipment

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

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

For the Government of the United States of America

By: _____

Date: 6/29/11

Witnessed:

By: _____

For the Municipal Government of Zacatecas

By: _____

Date: 24 - Junio - 2011

Witnessed:

By: _____

Annex I – Terms of Reference

Annex II – USTDA Mandatory Clauses

Annex I

Terms of Reference

Objective

The objective of the feasibility study ("Study") for the Zacatecas Landfill Gas Pilot Project ("Project") in Mexico is to enable the development of a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas. The Study will allow the Municipal Government of Zacatecas (Gobierno Municipal de Zacatecas) ("Grantee") to assess recoverable landfill gas resources, conduct a preliminary conceptual design of the Project, and draft legal documents and agreements for Project implementation.

General Considerations for Deliverables and Documents

The U.S. firm selected by the Grantee to perform the Study ("Contractor") shall undertake a quality control review process, including a technical and editorial review, of all deliverables and documents submitted to the Grantee to ensure readability, accuracy, and consistency. The interim deliverables specified in these Terms of Reference shall serve to keep the Grantee informed about the Contractor's work on the Study and to ensure that the Contractor's findings are acceptable to the Grantee before critical decisions are made on the Study. The Contractor shall submit monthly progress reports to the Grantee. The Contractor shall submit all deliverables and documents to the Grantee in English and Spanish.

Activities

Task 1: Kick-Off Meeting and Inception Report

Subtask 1.1: Kick-Off Meeting
The Contractor shall meet with the Grantee to discuss the details of the technical approach and work plan, including reporting requirements, the methodology for completing the Terms of Reference, and the working relationships between personnel engaged in the Study. The Contractor shall also conduct site inspections, obtain copies of available information, and make arrangements for the collection of additional field data, as needed.

The Grantee shall provide temporary working and meeting facilities to the Contractor. The Grantee shall also provide copies of current Mexican guidelines and policies for tariffs and the licensing of waste-to-energy generating plants.

Subtask 1.2: Inception Report
Following the kick-off meeting, the Contractor shall prepare an inception report that includes a list of attendees, topics discussed, and any agreed-upon refinements in the

technical approach and work plan. As part of the inception report, the Contractor shall perform a gap analysis based on the available information.

Interim Deliverable No. 1:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 1.

Task 2: Technical Analysis

Subtask 2.1: Available Documentation
The Contractor shall review available information and studies regarding the legal, technical, economic, social, and environmental aspects of the Project. The Contractor shall review any preliminary studies developed by the Grantee.

Subtask 2.2: Field Assessments
The Grantee has compiled preliminary data and has conducted preliminary field assessments for the proposed Project site that provide sufficient site information to confirm the environmental and technical safety of the site.

The Contractor shall supplement the preliminary data and field assessments, as needed, by performing the following field assessments:

- Conduct topographic survey (if not already done as part of the preliminary field assessments) to provide for full site mapping to meet the projected needs for at least 20 years of solid waste quantities, with survey mapping drawn at a 1:1,000 scale (or less) and with 2-meter contour intervals.
- Perform test holes to assess the soil conditions, determine soil type using sieve screenings and standard soil classification and characterization tests (such as sieve analysis, standard penetration tests, Atterberg limits, cation exchange capacity, and permeability), and assess the seasonal high ground water levels from mottling, piezometric levels, and other signs of a high water table. Dig at least 1 test hole for every 3 hectares (if not already done as part of the preliminary field assessments).
- Conduct geophysical surveys to determine the overall stratigraphy of soil and weathered rock layers and determine the depth to bedrock. Conduct at least 1 ground conductivity survey by electromagnetic transverse lines across each site every 200 meters (if not already done as part of the preliminary field assessments). Perform vertical electrical soundings to determine formation resistivities and thickness in greater detail at key anomalies identified by the electromagnetic surveys, or at a minimum of 3 locations per site (if not already done as part of the preliminary field assessments).
- Conduct borings to the uppermost confined aquifer (or to within 30 meters of the ground surface, whichever is less) to assess soils, geologic and hydrogeologic conditions, take peizometric water levels, take groundwater samples to test for basic parameters of potability, and determine flow directions. There shall be at least 1 boring for every 10 hectares per available site, and no less than 2 boreholes

for each available site (if not already done as part of the preliminary field assessments).

- Assess whether any deep aquifers that are used (or potentially anticipated to be used) for water supply are protected by a confining layer of impermeable rock or soil. Outline all catchment areas and surface waters on base maps at a 1:1,000 scale and delineate groundwater contours at 1-meter intervals.
- Conduct biological field studies to assess whether there are significant species or habitat at the site and identify agricultural activities. Delineate any on-site wetlands by soil type and plant species.
- Gather information from available sources regarding the socioeconomic background of the local population surrounding the site.
- Conduct traffic studies to determine the baseline use of the roads that are anticipated to be used by waste collection trucks when traveling to and from the proposed disposal and transfer sites, as well as the as-constructed adequacy of these roads, bridges, and culverts to support the additional size, weight, and number of anticipated vehicles traveling to and from the landfill.
- Determine wind, rainfall, evaporation, and other conditions that will affect the movement of windblown litter, dust, odor, noise, stack gas emissions, and landfill gases.

Subtask 2.3: Waste Sampling

The Contractor shall assess the available municipal solid waste ("MSW"), biomass, and agricultural waste production; prepare a detailed waste stream composition analysis; and review all reliability, handling, transportation, and other logistics.

The Grantee shall arrange and coordinate any required meetings with national and state regulatory bodies and other authorities, waste generators, and waste transporters.

The Contractor shall provide the Grantee with a clear set of parameters for a defined trial period of sorting and classifying the waste from the targeted waste stream sources in the Municipalities of Zacatecas, Guadalupe, Vetagrande, Morelos, and any other waste stream source in the vicinity. The Contractor shall:

- Collect samples and conduct analysis, as needed, to confirm the quantity and as-received density of solid wastes for which the facilities will be designed, as well as the density after natural consolidation, compaction, or biodegradation;
- Collect solid waste samples and conduct analysis to confirm waste composition, moisture content, and calorific value; and
- Conduct leachate generation tests and concentration studies, as needed, to confirm the quantity and characteristic of leachate for which the sanitary landfill leachate treatment facilities will be designed.

In undertaking the reliability and logistics analysis for the targeted sources, the Contractor shall:

- Analyze current prices, including transportation costs and their trends;
- Analyze transportation infrastructure in terms of its ability to handle the required volumes of waste; and

- Analyze transportation, handling, and storage issues and costs.

Interim Deliverable No. 2:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 2.

Task 3: Preliminary Conceptual Design and Technical Configuration

The Contractor shall investigate and evaluate the technical, environmental, and economic aspects of different Project layouts to determine a viable and appropriate preliminary design of the landfill gas collection and power generation plant, as described below:

- On the basis of the assessment of local infrastructure, waste composition, electricity tariffs, development plans of municipal and regional authorities, and other economic, technical, and environmental factors, the Contractor shall recommend the optimal location for a landfill gas collection and power generation plant on land defined by the Grantee. Siting shall take into account the potential for future plant expansion.
- The Contractor shall recommend the optimum configuration for extraction wells, well installation (vertical, horizontal, or hybrid), and well spacing.
- The Contractor shall determine interface points to connect the plant with the existing power grid. The selection of the interface points shall take into consideration the plans for the overall development of the regional and local power networks.
- The Contractor shall use the data collected to determine waste requirements, heat rejection, and electrical capacity of the plant.
- The recommendations for the selection of the primary recovery system and energy equipment for the plant shall be based upon economic performance, energy efficiency, reduced emissions, and other performance measures. The Contractor shall define all major requirements for the primary energy equipment and shall develop a main technological process flowchart, tome schedules, and procurement plans for the primary energy equipment.
- The Contractor shall develop the electro-mechanical technical configuration of the plant, including requirements for specialized waste and agricultural processing (if applicable).
- The Contractor shall prepare preliminary civil, mechanical, and electrical conceptual designs for all facility systems, including, but not limited to, structures, gas collection, blower and flaring (if applicable), condensate management, leachate management, power generation, biogas treatment, plant safety, communications, automated control, water treatment and water supply systems, sewage, fire prevention, and emission controls.
- Using all analyzed data as a basis, the Contractor shall prepare a general plot plan with preliminary drawings for the buildings and structures for the plant outline and other construction requirements.
- The Contractor shall prepare construction schedules. All designs, drawings, charts, calculations, schedules, and other documentation shall be prepared in compliance with the local, national, and international construction codes, norms,

rules, and environmental requirements, as well as with other requirements stipulated by the applicable Mexican regulations on landfill gas collection and power generation plants.

Interim Deliverable No. 3:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 3.

Task 4: Financial Analysis
The Contractor shall estimate the capital costs for the development of a landfill gas recovery utilization project, estimate the expected annual cost for operation, maintenance, and expansion of the landfill gas collection system, along with recurring costs for expansion of the capacity of a landfill gas blower and flaring station and power plant.

Subtask 4.1: Investment Costs
The Contractor shall develop a detailed budget of the investment costs based on the preliminary design recommended in Task 3, including, but not limiting to, the following:

Landfill Gas Collection and Flaring System:
- Mobilization and project management;
- Gas header collection piping;
- Lateral piping;
- Condensate and leachate management;
- Extraction wells;
- Blowers and flaring equipment;
- Engineering and contingency costs; and
- Up-front Clean Development Mechanism transaction costs (if applicable).

Power Generation (Landfill Gas-Fueled Power Plant):
- Interconnections;
- Plant construction and site work;
- Landfill gas measuring and recording equipment; and
- Engineering and contingency.

Subtask 4.2: Operations and Maintenance Costs
The Contractor shall determine an anticipated operations and maintenance ("O&M") budget, including, but not limiting to, the following:
- Labor, supervision, oversight, and financial management;
- Monitoring equipment;
- Parts and materials;
- Extraction wells and wellheads;
- Lateral and header piping;
- Power plant testing;
- Routine maintenance and repairs;
- Engineering and contingency fees;
- Insurance, taxes, and land-use fees; and

- Maintenance of roads, accesses, and facilities.

Subtask 4.3: Tariff Requirement

The Contractor shall determine the necessary tariff to meet O&M costs, necessary reserves, working capital, taxes, recovery of development costs, debt service, and required return on equity. The Contractor shall provide the calculations and explanations to assist the Grantee with the tariff filing (see Subtask 8.2).

The Contractor shall include a separate carbon credits model for internal rate of return ("IRR") calculations and shall explain the methodology adopted for such calculations.

Task 5: Economic Analysis

Using the "Mexican Model for Biogas" (available from the Environmental Protection Agency at http://www.epa.gov/lmop/international/mexicano.html), the Contractor shall estimate the gas recovery potential from the landfill and shall calibrate the model based on the data collected from the field assessments. The Contractor shall predict the expected generation performance of the Project, maintenance requirements under the expected historical disposal rates, methane content, methane recovery potential, and landfill gas system coverage.

The Contractor shall provide and substantiate estimates of downtime during maintenance and shall clearly define maintenance procedures. The Contractor shall model financial performance of the Project as a function of tariff, including estimations of variability due to precipitation changes, expansion and no-expansion scenarios, and equipment performance.

The Contractor shall conduct a pro forma spreadsheet analysis of the Project, showing the capital costs of the Project, including development expenses and debt and equity funding tranches; annual total generation from the performance analysis; revenues from energy and capacity sales; expenses (including O&M costs, staffing, training, inspections, lease payments, taxes, and the carrying cost of spare part inventories); debt service; and returns to investors. The Contractor's analysis shall show IRR and payback on investment within the financial structure developed in Task 6.

Task 6: Financing Plan

The Contractor shall assist the Grantee in preparing a financing plan consistent with the Grantee's financial resources and borrowing capacity, showing probable sources of equity and debt, and confirming that the Project conforms to the standards and portfolio policies of major multilateral lenders and to the policies for use of funds from the Government of Mexico and the State Government of Zacatecas. The financing plan shall include a proposed financial structure of the Project according to the policies and requirements of the likely financing parties, including the debt-to-equity ratio, debt coverage ratio requirements, recovery of development costs, covenants, term of loans, amortization methods, reserve requirements, closing costs, and other relevant parameters.

Interim Deliverable No. 4:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Tasks 4-6.

Task 7: Preliminary Environmental Impact Assessment

The Contractor shall conduct a preliminary review of the Project's environmental impact and environmental compliance with reference to local requirements and those of multilateral development banks (such as the World Bank and Inter-American Development Bank). This review shall identify potential negative impacts, discuss the extent to which they can be mitigated, and develop plans for a full environmental impact assessment in anticipation of the Project moving forward to the implementation stage. In particular, the Contractor shall identify any steps that the Grantee or other interested parties will need to undertake subsequent to the completion of the Study and prior to Project implementation. Specifically, the Contractor shall ensure that Project specifications conform to international best practices to minimize environmental impacts, as well as the limitations of the current environmental impact statement provided by the Grantee.

Task 8: Regulatory Review

Subtask 8.1: Permits
The Contractor shall confirm that the landfill gas recovery system conforms to the requirements of existing site permits, including land use, water use, waste disposal, highway access, security, wildlife preservation, noise limits, and other criteria as needed. The Contractor shall provide documentation, calculations, and examples to support the Grantee in submitting a filing for waivers, extensions, or new permits (as needed).

Subtask 8.2: Tariff Filing
The Contractor shall assist the Grantee in submitting a filing for a tariff for power by providing documentation and calculations in accordance with Mexico's legal framework and other economic and regulatory requirements. The Contractor shall provide the Grantee with the economic and financial projections developed in Tasks 5 and 6 as a component of the tariff calculation.

Task 9: Development Impact Assessment

For the benefit of those interested in the Project, the Contractor shall assess the development benefits associated with the Project and the methodology for measuring those benefits. The assessment shall include examples of the development benefits that would be expected in the Host Country if the Project is implemented as outlined in the Study. The Contractor shall focus on examples from the categories listed below and shall develop a methodology for assessing these impacts over time. The Contractor shall only list benefits in the categories that are applicable to the Project. The categories to be considered are as follows:

- Infrastructure: The Contractor shall estimate the expected scale of infrastructure development and improvements, such as a landfill gas collection and power generation plant and transmission and interconnection lines.
- Market-Oriented Reforms: The Contractor shall provide a description of any recommended regulations, laws, or institutional changes that would facilitate Project implementation, more transparent regulatory systems, or increased competition.
- Human Capacity Building: The Contractor shall estimate the number and type of jobs that would be created if the Project is implemented. Comment on any prospective training recommended (the training needed after and as a result of the Project), including an estimate of the number of persons to be trained, type of training needed, and the desired outcome of the training.
- Technology Transfer and Productivity Enhancement: The Contractor shall provide a description of any efficiency gains or productivity benefits resulting from Project implementation, as well as the introduction of any new technologies.
- Other: The Contractor shall identify any other developmental benefits of the Project that are not captured in the four categories listed above, including any spin-off or demonstration effects such as enhanced economic growth, increased investment, or indirect job creation.

Task 10: U.S. Sources of Supply

The Contractor shall identify prospective U.S. suppliers of equipment and services for the Project in accordance with Clause I of Annex II of the Grant Agreement. The Contractor shall identify the potential value of U.S. exports of equipment and services and prepare a list of U.S. suppliers that outlines prospective U.S. sources for procurement of goods and services related to Project implementation. The list shall include business name, point of contact, address, telephone and fax numbers, and a general description of products and services that may be procured.

Task 11: Implementation Plan

The Contractor shall develop an implementation plan, including, but not limited to, schedules and timelines for all Project-related activities, contracts, agreements, staffing and training, regulatory consent, financing, and ownership and management decisions. The Contractor shall also prepare a draft power purchase and interconnection agreement, developed in accordance with the policies and requirements of the Comisión Federal de Electricidad and the Grantee. The Contractor shall prepare draft tender documents that the Grantee may use to initiate international competitive bidding in accordance with the Grantee's policies and the laws of Mexico.

The Contractor's scope of responsibility ends with completion of the draft tender documents. If the Grantee requires further services for bid evaluation or subsequent design changes, the Grantee must negotiate separate payment for such services. The Contractor is not responsible for any work associated with publicizing the tender

documents or evaluating proposals under any procurement-related activities for this Project.

Interim Deliverable No. 5:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Tasks 7-11.

Task 12: Final Report

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement. The Final Report shall be prepared in English and Spanish.

Notes:

(1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.

(2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.

(3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.

(4) The Grantee shall be responsible for all procurement-related final decisions.

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 the Municipal Government of Zacatecas (Gobierno Municipal de Zacatecas) ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the Zacatecas Landfill Gas Pilot project ("Project") in Mexico ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

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

(2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility

or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

C. Nationality, Source, and Origin

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

D. Recordkeeping and Audit

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

E. U.S. Carriers

(1) Air

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

(2) Marine

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

F. Workman's Compensation Insurance

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

G. Reporting Requirements

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

H. Disbursement Procedures

(1) USTDA Approval of Contract

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

(2) Payment Schedule Requirements

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

(3) Contractor Invoice Requirements

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

(a) Contractor's Invoice

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

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

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

(ii) For contract performance milestone payments:

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

(iii) For final payment:

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

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

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

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

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

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

> "The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client."

(c) USTDA Address for Disbursement Requests

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

(4) Termination

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

I. USTDA Final Report

(1) Definition

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

(2) Final Report Submission Requirements

The Contractor shall provide the following to USTDA:

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

and

(b) One (1) copy of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

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

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

(3) Final Report Presentation

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

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

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

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

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

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

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

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

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by

the Client to this effect provided on or with the invoice for final payment will meet this requirement.

J. Modifications

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

K. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is December 31, 2012, is the date by which the parties estimate that the Study will have been completed.

(2) Time Limitation on Disbursement of USTDA Grant Funds

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

L. Business Practices

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

M. USTDA Address and Fiscal Data

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

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

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

Fiscal Data:

Appropriation No.:	1111/121001
Activity No.:	2011-51022A
Reservation No.:	2011204
Grant No.:	GH201151204

N. Definitions

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

O. Taxes

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

ANNEX 5

TERMS OF REFERENCE
(FROM USTDA GRANT AGREEMENT)

Annex I

Terms of Reference

Objective

The objective of the feasibility study ("Study") for the Zacatecas Landfill Gas Pilot Project ("Project") in Mexico is to enable the development of a 3 MW landfill gas collection and power generation pilot project in the Municipality of Zacatecas. The Study will allow the Municipal Government of Zacatecas (Gobierno Municipal de Zacatecas) ("Grantee") to assess recoverable landfill gas resources, conduct a preliminary conceptual design of the Project, and draft legal documents and agreements for Project implementation.

General Considerations for Deliverables and Documents

The U.S. firm selected by the Grantee to perform the Study ("Contractor") shall undertake a quality control review process, including a technical and editorial review, of all deliverables and documents submitted to the Grantee to ensure readability, accuracy, and consistency. The interim deliverables specified in these Terms of Reference shall serve to keep the Grantee informed about the Contractor's work on the Study and to ensure that the Contractor's findings are acceptable to the Grantee before critical decisions are made on the Study. The Contractor shall submit monthly progress reports to the Grantee. The Contractor shall submit all deliverables and documents to the Grantee in English and Spanish.

Activities

Task 1: Kick-Off Meeting and Inception Report

Subtask 1.1: Kick-Off Meeting
The Contractor shall meet with the Grantee to discuss the details of the technical approach and work plan, including reporting requirements, the methodology for completing the Terms of Reference, and the working relationships between personnel engaged in the Study. The Contractor shall also conduct site inspections, obtain copies of available information, and make arrangements for the collection of additional field data, as needed.

The Grantee shall provide temporary working and meeting facilities to the Contractor. The Grantee shall also provide copies of current Mexican guidelines and policies for tariffs and the licensing of waste-to-energy generating plants.

Subtask 1.2: Inception Report
Following the kick-off meeting, the Contractor shall prepare an inception report that includes a list of attendees, topics discussed, and any agreed-upon refinements in the

technical approach and work plan. As part of the inception report, the Contractor shall perform a gap analysis based on the available information.

Interim Deliverable No. 1:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 1.

Task 2: Technical Analysis

Subtask 2.1: Available Documentation
The Contractor shall review available information and studies regarding the legal, technical, economic, social, and environmental aspects of the Project. The Contractor shall review any preliminary studies developed by the Grantee.

Subtask 2.2: Field Assessments
The Grantee has compiled preliminary data and has conducted preliminary field assessments for the proposed Project site that provide sufficient site information to confirm the environmental and technical safety of the site.

The Contractor shall supplement the preliminary data and field assessments, as needed, by performing the following field assessments:

- Conduct topographic survey (if not already done as part of the preliminary field assessments) to provide for full site mapping to meet the projected needs for at least 20 years of solid waste quantities, with survey mapping drawn at a 1:1,000 scale (or less) and with 2-meter contour intervals.
- Perform test holes to assess the soil conditions, determine soil type using sieve screenings and standard soil classification and characterization tests (such as sieve analysis, standard penetration tests, Atterberg limits, cation exchange capacity, and permeability), and assess the seasonal high ground water levels from mottling, piezometric levels, and other signs of a high water table. Dig at least 1 test hole for every 3 hectares (if not already done as part of the preliminary field assessments).
- Conduct geophysical surveys to determine the overall stratigraphy of soil and weathered rock layers and determine the depth to bedrock. Conduct at least 1 ground conductivity survey by electromagnetic transverse lines across each site every 200 meters (if not already done as part of the preliminary field assessments). Perform vertical electrical soundings to determine formation resistivities and thickness in greater detail at key anomalies identified by the electromagnetic surveys, or at a minimum of 3 locations per site (if not already done as part of the preliminary field assessments).
- Conduct borings to the uppermost confined aquifer (or to within 30 meters of the ground surface, whichever is less) to assess soils, geologic and hydrogeologic conditions, take peizometric water levels, take groundwater samples to test for basic parameters of potability, and determine flow directions. There shall be at least 1 boring for every 10 hectares per available site, and no less than 2 boreholes

for each available site (if not already done as part of the preliminary field assessments).

- Assess whether any deep aquifers that are used (or potentially anticipated to be used) for water supply are protected by a confining layer of impermeable rock or soil. Outline all catchment areas and surface waters on base maps at a 1:1,000 scale and delineate groundwater contours at 1-meter intervals.
- Conduct biological field studies to assess whether there are significant species or habitat at the site and identify agricultural activities. Delineate any on-site wetlands by soil type and plant species.
- Gather information from available sources regarding the socioeconomic background of the local population surrounding the site.
- Conduct traffic studies to determine the baseline use of the roads that are anticipated to be used by waste collection trucks when traveling to and from the proposed disposal and transfer sites, as well as the as-constructed adequacy of these roads, bridges, and culverts to support the additional size, weight, and number of anticipated vehicles traveling to and from the landfill.
- Determine wind, rainfall, evaporation, and other conditions that will affect the movement of windblown litter, dust, odor, noise, stack gas emissions, and landfill gases.

Subtask 2.3: Waste Sampling

The Contractor shall assess the available municipal solid waste ("MSW"), biomass, and agricultural waste production; prepare a detailed waste stream composition analysis; and review all reliability, handling, transportation, and other logistics.

The Grantee shall arrange and coordinate any required meetings with national and state regulatory bodies and other authorities, waste generators, and waste transporters.

The Contractor shall provide the Grantee with a clear set of parameters for a defined trial period of sorting and classifying the waste from the targeted waste stream sources in the Municipalities of Zacatecas, Guadalupe, Vetagrande, Morelos, and any other waste stream source in the vicinity. The Contractor shall:

- Collect samples and conduct analysis, as needed, to confirm the quantity and as-received density of solid wastes for which the facilities will be designed, as well as the density after natural consolidation, compaction, or biodegradation;
- Collect solid waste samples and conduct analysis to confirm waste composition, moisture content, and calorific value; and
- Conduct leachate generation tests and concentration studies, as needed, to confirm the quantity and characteristic of leachate for which the sanitary landfill leachate treatment facilities will be designed.

In undertaking the reliability and logistics analysis for the targeted sources, the Contractor shall:

- Analyze current prices, including transportation costs and their trends;
- Analyze transportation infrastructure in terms of its ability to handle the required volumes of waste; and

- Analyze transportation, handling, and storage issues and costs.

Interim Deliverable No. 2:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 2.

Task 3: Preliminary Conceptual Design and Technical Configuration

The Contractor shall investigate and evaluate the technical, environmental, and economic aspects of different Project layouts to determine a viable and appropriate preliminary design of the landfill gas collection and power generation plant, as described below:

- On the basis of the assessment of local infrastructure, waste composition, electricity tariffs, development plans of municipal and regional authorities, and other economic, technical, and environmental factors, the Contractor shall recommend the optimal location for a landfill gas collection and power generation plant on land defined by the Grantee. Siting shall take into account the potential for future plant expansion.
- The Contractor shall recommend the optimum configuration for extraction wells, well installation (vertical, horizontal, or hybrid), and well spacing.
- The Contractor shall determine interface points to connect the plant with the existing power grid. The selection of the interface points shall take into consideration the plans for the overall development of the regional and local power networks.
- The Contractor shall use the data collected to determine waste requirements, heat rejection, and electrical capacity of the plant.
- The recommendations for the selection of the primary recovery system and energy equipment for the plant shall be based upon economic performance, energy efficiency, reduced emissions, and other performance measures. The Contractor shall define all major requirements for the primary energy equipment and shall develop a main technological process flowchart, tome schedules, and procurement plans for the primary energy equipment.
- The Contractor shall develop the electro-mechanical technical configuration of the plant, including requirements for specialized waste and agricultural processing (if applicable).
- The Contractor shall prepare preliminary civil, mechanical, and electrical conceptual designs for all facility systems, including, but not limited to, structures, gas collection, blower and flaring (if applicable), condensate management, leachate management, power generation, biogas treatment, plant safety, communications, automated control, water treatment and water supply systems, sewage, fire prevention, and emission controls.
- Using all analyzed data as a basis, the Contractor shall prepare a general plot plan with preliminary drawings for the buildings and structures for the plant outline and other construction requirements.
- The Contractor shall prepare construction schedules. All designs, drawings, charts, calculations, schedules, and other documentation shall be prepared in compliance with the local, national, and international construction codes, norms,

rules, and environmental requirements, as well as with other requirements stipulated by the applicable Mexican regulations on landfill gas collection and power generation plants.

Interim Deliverable No. 3:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Task 3.

Task 4: Financial Analysis
The Contractor shall estimate the capital costs for the development of a landfill gas recovery utilization project, estimate the expected annual cost for operation, maintenance, and expansion of the landfill gas collection system, along with recurring costs for expansion of the capacity of a landfill gas blower and flaring station and power plant.

Subtask 4.1: Investment Costs
The Contractor shall develop a detailed budget of the investment costs based on the preliminary design recommended in Task 3, including, but not limiting to, the following:

Landfill Gas Collection and Flaring System:
- Mobilization and project management;
- Gas header collection piping;
- Lateral piping;
- Condensate and leachate management;
- Extraction wells;
- Blowers and flaring equipment;
- Engineering and contingency costs; and
- Up-front Clean Development Mechanism transaction costs (if applicable).

Power Generation (Landfill Gas-Fueled Power Plant):
- Interconnections;
- Plant construction and site work;
- Landfill gas measuring and recording equipment; and
- Engineering and contingency.

Subtask 4.2: Operations and Maintenance Costs
The Contractor shall determine an anticipated operations and maintenance ("O&M") budget, including, but not limiting to, the following:
- Labor, supervision, oversight, and financial management;
- Monitoring equipment;
- Parts and materials;
- Extraction wells and wellheads;
- Lateral and header piping;
- Power plant testing;
- Routine maintenance and repairs;
- Engineering and contingency fees;
- Insurance, taxes, and land-use fees; and

- Maintenance of roads, accesses, and facilities.

Subtask 4.3: Tariff Requirement

The Contractor shall determine the necessary tariff to meet O&M costs, necessary reserves, working capital, taxes, recovery of development costs, debt service, and required return on equity. The Contractor shall provide the calculations and explanations to assist the Grantee with the tariff filing (see Subtask 8.2).

The Contractor shall include a separate carbon credits model for internal rate of return ("IRR") calculations and shall explain the methodology adopted for such calculations.

Task 5: Economic Analysis

Using the "Mexican Model for Biogas" (available from the Environmental Protection Agency at http://www.epa.gov/lmop/international/mexicano.html), the Contractor shall estimate the gas recovery potential from the landfill and shall calibrate the model based on the data collected from the field assessments. The Contractor shall predict the expected generation performance of the Project, maintenance requirements under the expected historical disposal rates, methane content, methane recovery potential, and landfill gas system coverage.

The Contractor shall provide and substantiate estimates of downtime during maintenance and shall clearly define maintenance procedures. The Contractor shall model financial performance of the Project as a function of tariff, including estimations of variability due to precipitation changes, expansion and no-expansion scenarios, and equipment performance.

The Contractor shall conduct a pro forma spreadsheet analysis of the Project, showing the capital costs of the Project, including development expenses and debt and equity funding tranches; annual total generation from the performance analysis; revenues from energy and capacity sales; expenses (including O&M costs, staffing, training, inspections, lease payments, taxes, and the carrying cost of spare part inventories); debt service; and returns to investors. The Contractor's analysis shall show IRR and payback on investment within the financial structure developed in Task 6.

Task 6: Financing Plan

The Contractor shall assist the Grantee in preparing a financing plan consistent with the Grantee's financial resources and borrowing capacity, showing probable sources of equity and debt, and confirming that the Project conforms to the standards and portfolio policies of major multilateral lenders and to the policies for use of funds from the Government of Mexico and the State Government of Zacatecas. The financing plan shall include a proposed financial structure of the Project according to the policies and requirements of the likely financing parties, including the debt-to-equity ratio, debt coverage ratio requirements, recovery of development costs, covenants, term of loans, amortization methods, reserve requirements, closing costs, and other relevant parameters.

Interim Deliverable No. 4:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Tasks 4-6.

Task 7: Preliminary Environmental Impact Assessment

The Contractor shall conduct a preliminary review of the Project's environmental impact and environmental compliance with reference to local requirements and those of multilateral development banks (such as the World Bank and Inter-American Development Bank). This review shall identify potential negative impacts, discuss the extent to which they can be mitigated, and develop plans for a full environmental impact assessment in anticipation of the Project moving forward to the implementation stage. In particular, the Contractor shall identify any steps that the Grantee or other interested parties will need to undertake subsequent to the completion of the Study and prior to Project implementation. Specifically, the Contractor shall ensure that Project specifications conform to international best practices to minimize environmental impacts, as well as the limitations of the current environmental impact statement provided by the Grantee.

Task 8: Regulatory Review

Subtask 8.1: Permits
The Contractor shall confirm that the landfill gas recovery system conforms to the requirements of existing site permits, including land use, water use, waste disposal, highway access, security, wildlife preservation, noise limits, and other criteria as needed. The Contractor shall provide documentation, calculations, and examples to support the Grantee in submitting a filing for waivers, extensions, or new permits (as needed).

Subtask 8.2: Tariff Filing
The Contractor shall assist the Grantee in submitting a filing for a tariff for power by providing documentation and calculations in accordance with Mexico's legal framework and other economic and regulatory requirements. The Contractor shall provide the Grantee with the economic and financial projections developed in Tasks 5 and 6 as a component of the tariff calculation.

Task 9: Development Impact Assessment

For the benefit of those interested in the Project, the Contractor shall assess the development benefits associated with the Project and the methodology for measuring those benefits. The assessment shall include examples of the development benefits that would be expected in the Host Country if the Project is implemented as outlined in the Study. The Contractor shall focus on examples from the categories listed below and shall develop a methodology for assessing these impacts over time. The Contractor shall only list benefits in the categories that are applicable to the Project. The categories to be considered are as follows:

- Infrastructure: The Contractor shall estimate the expected scale of infrastructure development and improvements, such as a landfill gas collection and power generation plant and transmission and interconnection lines.
- Market-Oriented Reforms: The Contractor shall provide a description of any recommended regulations, laws, or institutional changes that would facilitate Project implementation, more transparent regulatory systems, or increased competition.
- Human Capacity Building: The Contractor shall estimate the number and type of jobs that would be created if the Project is implemented. Comment on any prospective training recommended (the training needed after and as a result of the Project), including an estimate of the number of persons to be trained, type of training needed, and the desired outcome of the training.
- Technology Transfer and Productivity Enhancement: The Contractor shall provide a description of any efficiency gains or productivity benefits resulting from Project implementation, as well as the introduction of any new technologies.
- Other: The Contractor shall identify any other developmental benefits of the Project that are not captured in the four categories listed above, including any spin-off or demonstration effects such as enhanced economic growth, increased investment, or indirect job creation.

Task 10: U.S. Sources of Supply

The Contractor shall identify prospective U.S. suppliers of equipment and services for the Project in accordance with Clause I of Annex II of the Grant Agreement. The Contractor shall identify the potential value of U.S. exports of equipment and services and prepare a list of U.S. suppliers that outlines prospective U.S. sources for procurement of goods and services related to Project implementation. The list shall include business name, point of contact, address, telephone and fax numbers, and a general description of products and services that may be procured.

Task 11: Implementation Plan

The Contractor shall develop an implementation plan, including, but not limited to, schedules and timelines for all Project-related activities, contracts, agreements, staffing and training, regulatory consent, financing, and ownership and management decisions. The Contractor shall also prepare a draft power purchase and interconnection agreement, developed in accordance with the policies and requirements of the Comisión Federal de Electricidad and the Grantee. The Contractor shall prepare draft tender documents that the Grantee may use to initiate international competitive bidding in accordance with the Grantee's policies and the laws of Mexico.

The Contractor's scope of responsibility ends with completion of the draft tender documents. If the Grantee requires further services for bid evaluation or subsequent design changes, the Grantee must negotiate separate payment for such services. The Contractor is not responsible for any work associated with publicizing the tender

documents or evaluating proposals under any procurement-related activities for this Project.

Interim Deliverable No. 5:
The Contractor shall prepare and submit to the Grantee an interim report detailing the findings from Tasks 7-11.

Task 12: Final Report

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement. The Final Report shall be prepared in English and Spanish.

Notes:

(1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.

(2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.

(3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.

(4) The Grantee shall be responsible for all procurement-related final decisions.

ANNEX 6

U.S. FIRM INFORMATION FORM

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

U.S. Firm Information Form

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

USTDA Activity Number [*To be completed by USTDA*]	2011-51022A					
Activity Type [*To be completed by USTDA*]	✔	Feasibility Study		Technical Assistance		Other (specify)
Activity Title [*To be completed by USTDA*]	Zacatecas Landfill Gas Pilot Project in Mexico					
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		Publicly Traded Company				
		Private Company				
		Other (please specify)				
If Private Company or Other (if applicable), provide a list of shareholders and the percentage of their ownership. In addition, for each shareholder that owns 15% or more shares in U.S. Firm, please complete Attachment B.						
Is the U.S. Firm a wholly-owned or partially owned subsidiary?		Yes				
		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?		Yes				
		No				
If yes, U.S. Firm shall complete Attachment C for each subcontractor. Attached?		Yes				
		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: [insert state] 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: [insert state] 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 three-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		Signature	
Title			
Organization		Date	

ATTACHMENT A

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

U.S. Firm Information Form – Directors and Principal Officers

Provide a list of all directors and principal officers (e.g., President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer). Please provide full names including surname and given name.

USTDA Activity Number [*To be completed by USTDA*]	2011-51022A
Activity Title [*To be completed by USTDA*]	Zacatecas Landfill Gas Pilot Project in Mexico
Full Legal Name of Entity	

Title	Name		
(e.g., Director, President, Chief Executive Officer, Vice-President(s), Secretary, Treasurer) ***** *Please place an asterisk (*) next to the names of those principal officers who will be involved in the USTDA-funded activity*	**Surname**	**Given Name**	**Middle Name**

ATTACHMENT B

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

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

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

USTDA Activity Number [*To be completed by USTDA*]	2011-51022A		
Activity Title [*To be completed by USTDA*]	Zacatecas Landfill Gas Pilot Project in Mexico		
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	☐ Publicly Traded Company ☐ Private Company ☐ 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?	☐ Yes ☐ 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*]	2011-51022A
Activity Title [*To be completed by USTDA*]	Zacatecas Landfill Gas Pilot Project in Mexico
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 *[check one]*		Corporation		LLC		Partnership		Sole Proprietor		Other
	duly organized, validly existing and in good standing under the laws of:	[insert state (if U.S.) or country]	.								
	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 three-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								