

Request for Quotations Development of Regional Energy Systems Model February 2012

I. Introduction

The U.S. Agency for International Development (USAID) has contracted with Tetra Tech under Task Order No. AID-OOA-N-10-00002 of Contract No. EPP-I-00-03-0008-00 to help advance clean energy in the Europe and Eurasia (E&E) region¹ and to enhance the capacity of countries in the E&E region to prepare Low Emissions Development Strategies (LEDS).

Tetra Tech's work under this Task Order includes supporting the formulation of a regional energy strategy that provides a framework for facilitating investments in regional energy systems, promotes energy security, and looks beyond various national strategies to identify opportunities for promoting projects of regional significance. A key need is to develop a decision framework that supports the analytical needs of the team that is helping to prepare this regional energy strategy. USAID has determined that it will adapt and extend existing tools for this purpose.

As part of its earlier Regional Energy Demand Planning (REDP) and Regional Energy Security and Market Development (RESMD)/SYNERGY projects, USAID's E&E Bureau supported the development of national energy systems models, based on the MARKAL-TIMES framework², for the Contracting Parties and Observers of the Energy Community (EC) and neighboring countries, which include:

1. Albania
2. Armenia
3. Bosnia-Herzegovina
4. Bulgaria
5. Croatia
6. Georgia
7. Kosovo
8. Macedonia
9. Moldova
10. Montenegro
11. Romania
12. Serbia
13. Ukraine

With minor exceptions³, an operational ANSWER/MARKAL energy systems model exists for each of these countries, containing vetted data for the energy balance; resource supply (i.e.,

¹ Currently, the E&E Bureau of USAID operates programs in 15 countries through 11 missions and a Regional Services Center based in Budapest. These 15 countries are: Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina (BiH), Cyprus, Georgia, Ireland/Northern Ireland (UK), Kosovo, Republic of Macedonia, Moldova, Montenegro, Russia, Serbia, and Ukraine.

² An overview of the MARKAL-TIMES family of energy systems models, and detailed information on their access and use, can be found at <http://www.iea-etsap.org/web/index.asp>.

³ The key exceptions are: 1) the government of Kosovo has recently undertaken a new effort to develop an ANSWER/MARKAL model and its current state is unknown; however a prior version of the model is available; 2) no modeling activity has yet been completed in Montenegro; and 3) the model in Ukraine has been developed in the VEDA/TIMES framework rather than in the ANSWER/MARKAL framework.

energy imports, production, and price); power generation sector, and energy end uses. National Planning Teams, working in concert with an appropriate ministry or agency of each country's central government, are presently in place with knowledge of the models and their underlying data and assumptions.

To support the preparation of the RES, Tetra Tech wishes to engage a Subcontractor to develop a regional energy systems model that builds on these existing single-country energy systems models that USAID's E&E Bureau has already supported. The regional model will cover the EC Contracting Parties, including interactions with neighboring energy systems. The specific activities, deliverables and deadlines are presented in Attachment A, "Statement of Work".

II. Source and Nationality Restrictions

Consistent with Tetra Tech's prime contract with USAID, the Subcontractor must be from⁴ the United States of America, from a "Developing Country"⁵, or from a "Recipient Country"⁶.

III. Submission of Technical and Financial Proposal

All quotations are due on March 5, 2012 by no later than 17:00 hours Eastern Standard Time. Quotations must be submitted via e-mail in the following formats: Adobe Acrobat or Microsoft Word and/or Excel. Quotations e-mailed after the above-stated due date and time will not be considered for this procurement. The e-mail submission address is: john.wells@tetrattech.com

Tetra Tech requires the following:

- Technical Proposal
 - Organizational Summary:
 - Provide the Subcontractor's official registered title, type of business, address, and contact person information.
 - Provide a brief description of the Subcontractor.
 - List the resources that are available for this activity, including existing on-site facilities and computer systems (including hardware and software) to maintain and work with complex datasets and simulation models (including existing licenses for the MARKAL/TIMES family of models and components).
 - Organizational Experience. Summarize prior working experience of the organization with:
 - Development and use of energy systems models including the MARKAL/TIMES family of models.

⁴ For purposes of Subcontractor qualification, being "from" a Country means that the organization: a) must be incorporated or legally organized under the laws of the Country; and b) must be operating as a going concern in the Country; and either c) be managed by a governing body, the majority of whom are citizens or lawful permanent residents (or equivalent immigration status to live and work on a continuing basis) of the Country; or d) employ citizens or lawful permanent residents (or equivalent immigration status to live and work on a continuing basis) of the Country, in more than half its permanent full-time positions and more than half of its principal management positions.

⁵ For purposes of Subcontractor qualification, the definition of "Developing Country" is provided at <http://www.usaid.gov/policy/ads/300/310maa.pdf>

⁶ For purposes of Subcontractor qualification, the definition of "Recipient Country" is those 11 countries for which a regional energy model will be developed: Albania, Armenia, Bosnia-Herzegovina, Croatia, Georgia, Kosovo, Macedonia, Moldova, Montenegro, Serbia, and Ukraine.

- Research and systems analysis of energy demand and supply in developing countries and emerging markets.
- Analysis of energy demand and energy supply in developing countries and emerging markets.
- Structured processes to review, manage and assure quality of complex models and datasets.
- Staffing Plan:
 - Summarize the team composition (e.g., names, specialties, and roles) and task assignments.
 - Identify by name, describe the qualifications and experience, and provide the detailed curriculum vitae (CVs) of the Key Personnel, who include:
 - Lead MARKAL-TIMES modeler who meets the following minimum qualifications:
 - Undergraduate degree and postgraduate studies in a relevant academic discipline such as engineering, power systems, energy studies, economics, systems analysis, mathematics or statistics.
 - Five years of hands-on experience in programming, running, and interpreting the MARKAL-TIMES family of energy systems models.
 - Other MARKAL-TIMES modeler(s) who meet the following minimum qualifications:
 - Undergraduate degree in a relevant academic discipline such as engineering, power systems, energy studies, economics, systems analysis, mathematics or statistics.
 - Three years of hands-on experience in programming, running, and interpreting the MARKAL-TIMES family of energy systems models
 - Project Manager who meets the following minimum qualifications:
 - Undergraduate degree and postgraduate studies in a relevant academic discipline such as engineering, power systems, energy studies, economics, systems analysis, mathematics or statistics.
 - Fifteen years of experience managing research projects related to energy markets and energy systems.
 - Direct research experience with the development and application of energy systems models.
 - The Project Manager may also serve as one of the MARKAL-TIMES modelers
 - List the other personnel whom the Subcontractor will provide as needed based on its proposed Technical Approach.

- Technical Approach:
 - Describe the proposed Technical Approach, expanding and commenting on the technical specifications provided in Attachment A.
 - Provide a Work Plan that includes a proposed schedule for performing the specified tasks and submitting the deliverables, such that the entire activity is completed by 30 September 2012 (assuming a start date of March 12, 2012).
 - Provide evidence that Bidder can mobilize rapidly and sustain the proposed schedule.
- Financial Proposal
 - Bidder shall complete the **Table 1 – Budget** provided in the Technical Specification attachment, in order to allow Tetra Tech ES, Inc. to compare all quotes and make a competitive selection.
 - Bidder shall provide unit pricing in U.S. dollars.
 - Prices quoted in this document shall be valid for a 30-day time period, include all taxes and other costs.

For any inquiry, please contact (via fax or e-mail only):

John Bruce Wells
john.wells@tetratech.com
+1 703 387 2160 (fax)

All questions and answers will be shared with all bidders.

Award of any resulting Subcontract Agreement shall be made by Tetra Tech on a “best value” basis. “Best value” is defined as the offer that results in the most advantageous solution for Tetra Tech, in consideration of technical, cost, and other factors. In Tetra Tech’s evaluation, technical quality is substantially more important than proposed price. To judge technical quality, Tetra Tech will evaluate each Bidder’s:

- (60 points of 100 possible points) Demonstrated, hands-on experience of the organization and proposed staff in:
 - Conducting energy systems modeling using the MARKAL-TIMES framework;
 - Modifying, adapting and combining MARKAL-TIMES models that have been developed by external sources
 - Benchmarking MARKAL-TIMES models
 - Developing and managing semi-open MARKAL-TIMES models (i.e., which use Data Base Only options)
- (30 points of 100 possible points) Technical approach, including ability to mobilize rapidly and sustain an accelerated timeframe
- (10 points of 100 possible points) Technical credibility and established presence within the international community of energy systems modelers

Tetra Tech reserves the right to conduct discussions with selected bidder(s) in order to identify the best value offer.

IV. Terms of Payment

Payment terms for the awarded Subcontract Agreement shall be net thirty (30) days after satisfactory submission of each of the following deliverables. Payment shall be made by

Tetra Tech ES, Inc. (Arlington, VA) or in local currency via bank wire transfer. No advance payments will be provided.

Deliverables and Progress Payment Schedule

Deliverable #	Task #	Deliverable	Billing %
1.2	1	Finalized presentation of technical approach	10
2.1	2	Integrated regional model	40
2.2	2	Presentation on integrated regional model	5
2.3	2	Summary report	10
3.1	3	Enhanced integrated regional model	20
3.2	3	Presentation on enhanced integrated regional model	5
3.3	3	Enhanced summary report	10
		Total	100

V. No Award

Tetra Tech ES, Inc. reserves the right to issue no awards

Attachment A Technical Specification

Task 1: Refine Approach

Within one week of award, the Subcontractor shall deliver a presentation – including a summary of the technical approach, a process flow diagram, a listing of staff, and a chart of the project schedule – that details how it will undertake to complete this activity within the specified timeframe. Based on discussion with Tt and USAID, the Subcontractor will modify the approach and deliver a revised and finalized presentation within three business days, which will serve as the guide for undertaking this activity.

Deliverables and Schedule, Task 1	
1.1 Presentation summarizing the technical approach	To be submitted by 19 March 2012
1.2 Revised/finalized presentation of the technical approach	To be submitted by 26 March 2012

Task 2: Develop Regional VEDA/TIMES model

After receiving in open form the input excel workbook / DB (data base) of the most recent functioning version of the existing ANSWER/MARKAL or VEDA/TIMES single region models for Albania, Bosnia-Herzegovina, Croatia, Macedonia, Moldova, Serbia, and Ukraine, and related input files, the Subcontractor shall assemble a regional VEDA/TIMES energy systems model through a structured process that includes:

- Review and benchmarking of existing ANSWER/MARKAL or VEDA/TIMES single region models for Albania, Bosnia-Herzegovina, Croatia, Macedonia, Moldova, Serbia, and Ukraine.
- For these existing country models, identifying assumptions and data that require explanation, correction and updating (note that Tt will deploy its regional and in-country resources to obtain such data, as needed; i.e., the subcontractor should not include the cost of obtaining such data as a proposed cost).
- Integration of these existing single region country models within a single, regional integrated VEDA/TIMES model that includes interactions with neighboring energy systems, and which is constructed using a Data Base Only (DBO) option that avoids risk of destruction and makes it possible to integrate comments and improvements of the country teams.
- Harmonization of assumptions (e.g., time of day resolution) as necessary.
- Review and benchmark of the regional VEDA/TIMES model.

Deliverables and Schedule, Task 2	
2.1 Presentation on the integrated regional model's development process, prepared in PowerPoint™	To be submitted by 15 April 2012 and with a May 2012 mid-month update
2.2 Integrated regional model (excel sheets and input DB), with	To be submitted by 31

key assumptions clearly identified and key data sets annotated. The model shall be provided as a set of electronic files on a cd or other portable media	May 2012
2.3 Presentation of a summary report with the main model assumptions and results.	To be submitted by May 31, 2012

Task 3: Enhance the Capabilities of the Regional VEDA/TIMES model

The Subcontractor shall enhance the capabilities of the regional VEDA/TIMES model that emerges from the structured integration process in Task 1. The subcontractor shall make the following enhancements:

- Model the energy systems of Montenegro and Kosovo, to the same extent and using the same approach as for the other countries that have been modelled. As noted earlier, Tt will be responsible for providing the information required to allow for the energy systems of both Montenegro and Kosovo to be modelled.
- Model intra-regional and inter-regional trade of oil and gas, including realistic and explicitly stated assumptions/scenarios for the current and planned capacity and utilization of oil/gas pipelines.
- Model intra-regional and inter-regional trade of electricity, including realistic and explicitly stated assumptions/scenarios for the current and planned capacity and utilization of electricity generation and electricity transmission networks. Subcontractor shall determine a method to allow for the VEDA/TIMES model to work with the regional power flow model (PSS/E) used within the SECI (Southeast European Cooperative Initiative).
- Prepare a reference scenario consistent with the scenario reported by each country to the Energy Community so that it will meet their mandatory renewable energy and energy efficiency targets as the reference scenario. These scenarios are usually detailed in each country's National Renewable Energy Action Plan (NREAP) and National Energy Efficiency Action Plan (NEEAP).
- It is expected that alternative scenarios will require modelling support from the contractor, but these scenarios have yet to be defined. Following definition, Tt shall engage the contractor to determine how best to provide the support required to develop and model these alternative scenarios. (It is not necessary for the cost associated with such scenarios to be indicated in the requested financial proposal).

Deliverables, Task 3	
3.1 Presentation on the integrated regional model's development process, prepared in PowerPoint™	To be submitted by 18 May 2012 with monthly updates until completion
3.2 Enhanced integrated regional model including the additions of Montenegro and Kosovo (excel sheets and input DB), with assumptions clearly identified and data sets annotated. The model shall be provided as a set of electronic files on a cd or other portable media	To be submitted by 30 September 2012
3.3 Presentation of a summary report with the main model assumptions and results	To be submitted by 30 September 2012

Table 1 – Budget

Labor	Days	Fixed Daily Rate (USD)	Total Cost (USD)
Project Manager	###	###	###
Research Analyst	###	###	###
Insert rows for other positions as needed	###	###	###
Subtotal, labor	###	###	###
Direct Costs			
Communications	Identify assumptions		###
Specialized Software	Identify assumptions		###
Other (insert rows for other direct costs as needed)	Identify assumptions		###
Subtotal, direct costs			###
TOTAL			###