PN: 15.200.001.01

TERMS OF REFERENCE
Short Term Expert - Energy Security

Bids are invited from Individual Experts Only

1. Background

The Ministry of Energy and Water (MEW) is the responsible Ministry for the development of the energy sector in Afghanistan. The MEW designs policies, strategies and sector plans and facilitates governmental decision-making processes. Additionally, MEW encourages the implementation of policies and strategies by public and private stakeholders in order to match the growing energy demand of population, industry, commerce and transport. This includes the energy production by traditional energy sources as well as renewable energy (REN) sources. The Renewable Energy Department (RED) of the Ministry is the main technical body responsible for supporting the REN sector in Afghanistan. The Ministry of Rural Rehabilitation and Development (MRRD) coordinates the use of specific capacities of renewable energies for rural development in an institutional agreement with the MEW.

The Afghan-German technical cooperation program “Renewable Energy Supply for Rural Areas of Afghanistan” ESRA started in 2007. As part of a broader infrastructure cooperation program in northern Afghanistan it seeks to provide up to two million people in rural areas of Northern Afghanistan with access to improved infrastructure (energy, drinking water, roads) by 2013. Within this framework, ESRA´s contribution consisted of the construction and rehabilitation of 10 small MHP and PV power plants. In 2014, a program revision resulted in changing the program´s focus on strengthening institutional capacities rather than implementing and constructing projects, in this way focusing on sustainable impacts. The program has been renamed accordingly: Institutional Development for Energy in Afghanistan (IDEA). Besides strengthening the key public institutions of the energy sector (MEW, DABS, and MRRD) IDEA intends to link the micro, meso and macro level, promote awareness of renewable energy and energy efficiency and enable private investment into the energy sector. The support of this technical cooperation (TC) measure´s instruments includes advisory, assessment and training

Securing stable, environmentally friendly and economical supplies of energy is a key focus of the Ministry's efforts and features prominently in the newly developed five-year energy sector development plan. The intent is that the energy supply and delivery system should be resilient against disruptions caused by natural disasters, human activity (e.g. sabotage), and the potential impacts of climate change.

Within this context, GIZ/IDEA intends to engage the services of a short-term consultant to perform an assessment of the security of energy supply and delivery in Afghanistan, with a view towards providing the Ministry with the tools necessary to integrate energy security considerations into broader energy sector development plans.

2. Objective

The overarching objective of the assignment is to enable the MEW to include energy security considerations into national planning in a structured manner. This assessment will include both short-term and localized disruptions to components of the energy infrastructure due to natural disasters or human activity, as well as longer-term considerations such as the impacts of climate change on regional and national energy supplies.

The objectives of the study will include (but may not be limited to):

- Assessing the existing energy system (supply and delivery) of the country to short and long-term security threats (both natural and human).
- Identifying key vulnerabilities to the threats and actions to mitigate risk.
- Developing a framework to assess the resiliency of proposed energy system components to deliver clean, stable, affordable energy against human and natural disruptions.
- Incorporating the assessment and framework described above into tools that MEW staff can use to integrate energy security issues into sector development strategic and operational planning.

3. Methodology and main tasks

While applicants will propose a methodology and concept plan to accomplish the above objectives, it is anticipated that the following elements will be considered:

- A literature review to determine what aspects of international experience with energy security planning are applicable to the Afghan context.
- The development of indicators to assess energy security at the national, provincial, and local level. It is expected that these indicators will be aligned with the broader sector goals of improving the energy system's ability to source and deliver secure, reliable, financially viable and equitable energy supplies.
- Development of a framework that incorporates these indicators and allows for an energy security assessment of existing and proposed energy system elements. Elements that would be assessed within the context of energy security would include (but may not be limited to):Overall national energy supply mix between imported and domestic generation, fuel sources (e.g. renewables, oil/gas), centralized vs. decentralized system architectures, supply-side and demand-side measures.
- Application of the framework and indicators to identify and prioritize vulnerabilities in the existing energy system (which includes energy supply and delivery components).
- Identification of actions that would reduce vulnerabilities above (and thus improve energy security).
- Identification of barriers to implement recommended actions above and measures to address said barriers.
- The development of a tool and / or training material that enables MEW to conduct energy security assessments.
- Identification and development of links between energy security assessment elements and other sector development processes.

4. Deliverables

The Consultant will provide the following deliverables:

1. Work plan and implementation plan within ten working days after commencement of assignment.
2. Afghanistan Energy Security Concept and Proposal
3. Development of a draft assessment of the existing energy system and linked framework for assessment of proposed system components for review by MEW and other stakeholders.
4. Development of final assessment and framework upon incorporation of received comments.
5. Development of training and toolkits for use by MEW to conduct assessments of energy security at various levels (e.g. national, local).
6. Documentation of linkages between energy security assessments and broader energy sector planning.
7. Recommendations for future work with regard to energy security planning and assessment.

5. Responsibilities of coordination and reporting

The Consultant will work under the direct supervision of H.E. Deputy Minister of Energy (DM-Energy), with additional input from GIZ / IDEA staff. The draft and final reports will be provided to the office of the DM-Energy and to GIZ/IDEA.

6. Type of Contract

Individual (one consultant)

7. Consultants' Experience and Qualifications

The Consultant shall have the following expertise:

- A Master's degree or above in engineering or in a related field of study.
- 10 years of professional experience which includes demonstrated expertise in technical, financial, and policy assessments in the energy sector. Past experience with energy security, energy supply and delivery systems would be an advantage.
- A broad knowledge about power sector planning, including energy supply (both conventional and renewables), as ancillary requirements for sector development.
- Skilled with energy sector policy, regulation, economics and engineering with experience assessing and incorporating international best practices to a local context.
- Excellent written and communication skills.
- A strategic planner with sound technical skills, analytical ability, good judgement and strong operational focus;
- Previous working experience in transition countries is desired;
- Previous working experience in the energy sector in Afghanistan would be considered an advantage.

8. Date and Venue of Consultancy

The duration of the contract will be for 2 months beginning 06 May 2016, with the possibility of extension reserved by GIZ in consultation with the office of the DM-Energy.

9. Annexes:

Annex A:

Energy, Development and Security:

The development of a sustainable, long-term solution to meeting the county energy needs is a defining issue of our time. Energy is directly linked with the key global challenges that the world faces such as poverty alleviation, climate change, and global, environmental and food security.

Afghanistan is endowed with a vast potential for energy resources, including hydro, coal, gas, solar, biomass and wind power that could significantly contribute to the expansion and the sustainability of its power supplies. Specifically, Afghanistan has a potential to produce over 23,000 MW of hydropower, with only 260 MW having been developed so far. It also has significant solar resources since it enjoys approximately 300 days of sunshine a year. A number of rural parts of Afghanistan benefit from micro-hydro power units installed over the last decade. However, despite having good resources, so far only a fraction of the population has access to electricity. Renewable Energy would offer a suitable solution to rural, remote, mountainous and insecure areas that are difficult and expensive to connect to a power grid.

Current energy systems are failing to meet the needs of the peoples. 67% of the people in the county do not have access to electricity which is primarily provided by imported electricity and hydropower. Three last decades of warfare have left the country's power grid badly damaged. As of 2012, approximately 33% of Afghan population has access to electricity and in the capital Kabul, 70% have access to reliable 24hr electricity. Afghanistan generates around 600 megawatts (MW) of electricity mainly from hydropower followed by fossil fuel and solar.

Da Afghanistan Breshna Sherkat (DABS) estimate that the country will need around 3,000 MW to meet its needs by 2020. Afghanistan's installed energy capacity has increased by around 139%, from approximately 430MW in 2001 to 1029MW in 2009, and the overall supply of electricity has almost tripled between 2006 and 2012.

- **ENERGY SECURITY BACKGROUND AND IMPORTANCE**

Background on Energy Security:

Energy security refers to a resilient energy system. This resilient system would be capable of withstanding threats through a combination of active, direct security measures-such as surveillance and guards-and passive or more indirect measures-such as redundancy, duplication of critical equipment, diversity in fuel, other sources of energy, and reliance on less vulnerable infrastructure.

Energy security is the association between national security and the availability of natural resources for energy consumption. Access to cheap energy has become essential to the

functioning of modern economies. However, the uneven distribution of energy supplies among countries has led to significant vulnerabilities.

Renewable energy resources and significant opportunities for energy efficiency exist over wide geographical areas, in contrast to other energy sources, which are concentrated in a limited number of countries. Rapid deployment of renewable energy and energy efficiency, and technological diversification of energy sources, would result in significant energy security and economic benefits.

The importance of Energy Security

Energy has always been an important element for the economic development and social progress of all nations. Today, a major part of the global energy needs is met by fossil fuels such as oil, gas and coal. Unfortunately, the global reserves of these nonrenewable sources are very limited. Therefore, many nations in the world are worried about security of their future energy supplies, especially those dependent heavily on the imports for these.

Afghanistan faces energy security concerns at the national and household level. Considering the fact that the household sector is the largest energy consumer sector of the country it is important to highlight the energy security concern at the household sector. Also, it is necessary to analyze the measures taken to improve the energy security and the impact of such measures at both the national and household level. This study will contribute to existing discussion in Afghanistan and the moving towards greater energy independence and stability. It will also bring better awareness to the people, policy makers, media, and so on, at the national and household level.
The study is, therefore extremely important for Afghanistan to establish a sustainable energy future by understanding the issues in detail, given the increasing dependence on the imported sources of energy