

**PROPOSED FEASIBILITY STUDY AND ASSESSMENT
OF RENEWABLE ENERGY OPPORTUNITIES
IN RURAL COMMUNITIES IN KYRGYZSTAN**

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SUBMITTED TO:

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Background

66% of the Kyrgyz population resides in rural areas. Many of these rural communities lack basic conveniences - most notably, electricity - hindering the provision of key entitlements such as proper healthcare and education. In other developing nations, such a technological divide has led to rapid urbanization and a deterioration of rural communities. Therefore, the preserved integrity of rural communities and the realization of nationwide development goals in Kyrgyzstan can be directly tied to the provision of affordable energy to all.

The Kyrgyz electricity system was part of the Central Asia electricity system in the former Soviet Union. Upon independence, Kyrgyzstan inherited the power stations and lines located on its territory. After independence, a vertically integrated, state-owned utility (Kyrgyzenergo) was formed to generate, transmit, and distribute electricity in Kyrgyzstan. This organization was recently unbundled into separate companies.

The energy sector reform has included removal of state subsidies, improved billing systems to better the financial health of the utility companies, and privatization of the transmission and distribution companies.

Two existing problems are the limited amount of available investment to improve the electric sector and continued commercial losses through theft, faulty meters, incorrect records, and non-payment.

Although Kyrgyzstan exports electricity to neighboring countries many of its rural communities are not connected to the transmission grid. Topography and lack of financing has limited this development and as a result many rural communities lack electric service with resulting infrastructure problems for healthcare clinics and schools. Many companies that are faced with these problems have turned to renewable energy and off-grid service to resolve these concerns.

Objective

The objective of this assessment will be to conduct an on-site evaluation of the potential for renewable energy pilot projects for rural electrification, specifically for healthcare clinics and schools. The assessment will also identify the availability of interested investors for a pilot project.

Concerns and Issues

Increased growth of Kyrgyzstan's private energy sector is dependent not only on the availability of affordable technologies but also a number of key and potentially sensitive political, regulatory and market issues. To this end, it is critical to independently observe and formulate unbiased recommendations in these areas:

Political

- Review the relationship between the government, the utility companies and the State Energy Agency.
- Review the policies and laws related to renewable energy projects.
- Review the laws relating to local and foreign investments.

Regulatory

- Review of policies, rules, licensing process, and tariff structure.
- Evaluate whether the agency is independent of government control.

Investment Climate

- Review availability of local investors.
- Explore availability of loans and incentives for local investors.
- Review policies regarding foreign investors.

Action Plan

The activities on this program will include preparation of agendas, handout materials, arranging meetings with energy sector participants, background research, logistics, and translations.

Meetings will be held on-site in Kyrgyzstan with the Ministry of Energy, Ministry of Foreign Affairs, Ministry of Economics, Kyrgyzenergo, the State Energy Agency, the transmission and distribution companies, USAID/Kg, the U.S Embassy, local banks, and representatives of healthcare clinics and schools.

Contact will be made from the U.S. with US Trade and Development Agency (USTDA), the International Finance Corporation (IFC), the European Bank for Reconstruction and Development (EBRD), and the Harza Corporation to gain additional perspective and level of interest in a pilot project.

A Final Assessment Report will be issued approximately two months after the program is authorized by USAID/Kg.

Conclusions

Key development objectives, including improved primary healthcare and education, have stalled in rural Kyrgyzstan due to an absence of sufficient electricity. Without proper refrigeration for vaccines and other medicines, basic diagnostic equipment, and communications/media equipment, all of which are dependent upon electricity, Kyrgyzstan's health and educational opportunities are severely limited.

The demand for rural electrification in Kyrgyzstan is apparent and the country's physical characteristics are conducive to a number of stand alone or hybrid renewable energy options. These technologies are well developed, increasingly utilized in global development projects, and are affordable enough to be applied in small rural settings. By promoting renewable energy alternatives during this critical growth stage, Kyrgyzstan's government and international donors can potentially skip generations development in the nation's energy sector and advance other health and education objectives.

Recommendations

This proposal recommends a Feasibility Study and Assessment of Renewable Energy Opportunities for Rural Electrification. The assessment will provide an alternative to the expensive choice of extension of the transmission grid and will also evaluate the potential for a pilot project for a rural healthcare facility and the potential for local or foreign investors. The assessment will include a program outline and summary for the potential pilot project.

The Resource & Policy Exchange (RPX) is an independent NGO that is impartial to the energy sector and will develop a strategy that considers the interests of all parties. RPX is interested in improving the human conditions in rural areas while preserving the opportunities for businesses to be profitable. RPX has previous experience in the area of rural electrification and previous experience in Central Asia.

Additional Options

The following activities are not included in this proposal, but are being included here for consideration by USAID/Kg.

1. A workshop to attract investors and energy sector participants to participate in a potential pilot program for rural electrification.
2. Assistance to form a Kyrgyz Chapter of the Association of Energy Engineers or a National Energy Association, similar to the one in

Kazakhstan. These organizations would provide opportunities for information exchange.

3. An Executive Exchange Visit to the U.S. (either New York State or Wisconsin) for representatives of the Ministry of Energy, a potential investor, a customer rep from the Healthcare Clinic, the State Energy Agency, and Kyrgyzenergo. This visit would introduce the participants to a U.S. renewable energy facility.

APPENDIX
Overview of Selected Alternatives in Renewable Energy

Hydroelectric	
<p>ADVANTAGES</p> <ul style="list-style-type: none"> + Abundant fuel source + Energy can be stored in reservoirs until needed + Quick start up for generation 	<p>CONCERNS</p> <ul style="list-style-type: none"> – Initial construction must be properly planned & executed, – Larger projects can be expensive – Installation restrictions- environmental conditions are critical
Solar	
<ul style="list-style-type: none"> + Abundant and reliable fuel source + No harmful exhaust or by-product + Established network of manufacturers, dealers, installers and consumers + Can store energy in batteries until needed 	<ul style="list-style-type: none"> – High initial cost – Need back-up for bad weather (batteries or generator) – Installation restrictions-need proper (west) exposure for maximum output
Wind	
<ul style="list-style-type: none"> + Abundant fuel source + Can store energy in batteries until needed + Well developed technology-in use in the US until late 1950's + No harmful exhaust 	<ul style="list-style-type: none"> – High installation cost – High maintenance requirement – Installation restrictions-minimum sustained wind speed required – Need back up for still weather- batteries or generator
Geothermal	
<ul style="list-style-type: none"> + Abundant fuel source + Warm or cold air can be extracted from system and used for indoor climate control (heating in winter, cooling in summer) 	<ul style="list-style-type: none"> – High initial cost-construction needs to be properly planned & executed – May require additional heat source to create steam to generate electricity
Fuel Cells	
<ul style="list-style-type: none"> + Low emissions – Carbon dioxide & water + Reliability + Up to 40% efficiency-by product of heat for buildings + Flexibility-cells can be designed in many shapes & sizes + Portability 	<ul style="list-style-type: none"> – High initial expense – Burns fossil fuel