

Sustaining Solar Energy in Northern Mongolia

Purpose

BioRegions International understands that decisions and actions informed by a holistic view including ecology, economy and culture provide the strongest long-term solutions to the diverse challenges facing indigenous peoples in a modernizing world. In close cooperation with local citizens, the BioRegions International solar project in Renchinlumbe, Mongolia, will strengthen the long-term sustainability of the Darhad Valley by establishing well-maintained local solar power systems that will help educate young people, support healthcare, and reduce the ecological impact of local electricity production.



Why Solar?

As the vast majority of the country is not serviced by a centralized power grid, Mongolia is an ideal place for solar power generation. The country enjoys, on average, 300 days of sunshine per year. Solar power systems, also known as *photovoltaic* (PV) systems, need only sunshine to operate, require little maintenance, produce no pollution, and are very low cost after installation.

Increased solar power use in Renchinlumbe, the population center of the Darhad Valley in northern Mongolia, would enable the town to grow and develop without regard to rising fuel costs and without endangering the local environment. Most Darhad Valley residents are semi-nomadic herders whose lives and livelihoods are deeply intertwined with the vitality of their immediate environment. Deforestation, air and water pollution, soil degradation, as well as other ecological and social costs of life in a modern world, profoundly impact this community. The long term sustainability of both the ecology and culture of the Darhad Valley depends on the community's ability to meet their needs today without jeopardizing their future. Locally produced, renewable electricity is an integral part of the solution.

BIOREGIONS INTERNATIONAL

MISSION

BioRegions International works to empower the nomadic cultures of Mongolia to survive in a rapidly-changing world. We support holistic, locally-based projects promoting public health, education, environmental preservation, and economic development.

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Objectives

BioRegions' solar project in Renchinlumbe focuses on two strategic community centers—the boarding school and the hospital. With nearly 1,000 students, the boarding school is Mongolia's largest. During the winter, semi-nomadic herders migrate out of the Darhad Valley to winter pasture on the shores of Lake Khovsgol over the mountains to the east. Many herders leave their children at the boarding school in Renchinlumbe to continue their studies over the winter and to protect them from the dangers of migration. The hospital provides primary and emergency care for a large region with a dispersed population. The next-nearest hospital with more advanced care is a 10 hour drive from Renchinlumbe over rough roads.

Phase I of the solar project entails the design and installation of a PV system to service a new computer lab at the boarding school. This PV system will be in addition to two small-scale PV systems now operating in the school's library and kitchen, previously installed by BioRegions and community partners with the support of the Bozeman Sunrise Rotary. Further training of community members in photovoltaic design, installation and maintenance will also be conducted by Mongolian professionals to assure long-term success.

Phase II of the project lays the groundwork for future installation of a PV system at the local hospital to expand both the range and quality of available care and to reduce the incidence of high-risk emergency patient transport to other hospitals in the region. Periodic assessments will be conducted to ensure that goals are being met.

Project Management

A successful project must be both the pride and responsibility of the community that it serves. Primary responsibility for the pace and implementation of the solar project lies with community members, including the school director, the hospital administrator, and Renchinlumbe's former mayor. Catherine Kirkland, a second year Bio-Resources Engineering student from Montana State University, will facilitate and coordinate the project, with oversight from BioRegions International staff and Montana State University faculty. Ms. Kirkland earned a BA in Anthropology and Sociology from Rhodes College in Memphis, TN, and pursued graduate studies in International Development Studies at the Universiteit van Amsterdam in the Netherlands. This knowledge and extensive international experience, including independent travel to Mongolia, will complement her engineering skills as she builds a career in environmentally sustainable and culturally appropriate alternative energy applications in the developing world.

Outcomes

Successful execution of the project will allow for sustainable, year-round electricity to power the new computer lab, providing enhanced opportunities for education, communication, entertainment and economic development both to students and to the community at large. In addition, we anticipate that 5-10 Darhad Valley citizens will gain sufficient skills to provide ongoing PV system maintenance for the community. Expanded reliance on solar power in Renchinlumbe will also reduce the demand for diesel fuel to operate the town's generator, thereby reducing both the number of times per year the diesel truck must make the 900 mile round-trip from Ulaan Baatar to Renchinlumbe, and the ecological impacts of those trips. A switch to solar power for basic power needs would also improve indoor and outdoor air quality by reducing the production of greenhouse gases. Successful community implementation of sustainable electricity can also be a model for other communities across developing rural Mongolia.



Budget

BioRegions International anticipates expenditures of \$15,000 US to fund the solar project at the Renchinlumbe boarding school. This amount includes funds for all PV equipment—modules, batteries, wires, control boxes, and hardware—shipping and installation, as well as expenses to supplement Catherine Kirkland's travel to coordinate the project implementation.

