Nepal commercial microgrids

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Nepal has been going through a massive energy crisis. Only 70 percent of Nepal"s population (of 28 million) has access to electricity. Even the "electrified" population are subjected to regular black-outs because of irregular supply and aging infrastructure.

For remote areas, grid extension can be quite expensive. As such, solar microgrids seem to be a promising solution. One that can provide people with not just basic access to lighting, but also with high quality, grid-comparable electricity to operate productive end use (PEU) loads that help local micro enterprises generate revenue.

To test the commercial viability of solar microgrids, Gham Power began developing the very first solar microgrid in the remote, mountainous districts of Khotang and Okhaldhunga in Nepal. This project was an exercise in identifying the optimal mix of debt, equity and assistance funding that would make rural solar microgrids financially viable to private developers. The project also focused on powering PEU loads. This would ensure higher load demand, and promote local businesses, with the hypothesis that this would increase the commercial viability of the project.

Currently, only 11% of Nepal"s rural population of about 23 million people has access to electricity. It"s prohibitively expensive to string power lines across the country"s rugged, precipitously steep mountainsides. As a result, many people who live in remote villages still subsist on kerosene and batteries.

But, pioneering Nepalese renewable energy developer Gham Power has spent almost a decade tackling the electricity challenge in Nepal, and they have an impressive track record. Since its founding in 2009, the Kathmandu-based company has installed over 2,000 solar PV and hybrid renewable energy systems with a total capacity of over 2.5 MW, using HOMER software to model many of their systems. Gham Power has some important lessons to share that could benefit any organization working on energy access issues.

Gham Power has learned that in order to make community microgrids profitable and scale up their development, energy developers must find a way to finance and support successful local businesses that need electricity. When business users provide ongoing financial support for microgrids, householders with smaller power requirements can benefit from the infrastructure of a sustained electricity supply.

That finding has led Gham Power to develop new ways of planning and financing microgrids in Nepal. The company"s General Manager Anjal Niraula says "The main difficulty of implementing mini-grid projects is not technical, but defining a business model around its implementation: how to fund a project and make a viable business out of it." Niraula elaborated on this idea for his presentation at the 2018 HOMER Energy

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International Microgrid conference on the vital role of "productive end use" in microgrids.

Now the company provides a variety of distributed energy developments, including water pumps for agriculture, installations for commercial and industrial customers, and micorgrids for remote communities without main grid access.

Business uses of microgrids in Nepal can include cell phone towers such as those owned by Gham Power partner NCELL (Nepal"s first private cell phone company), irrigation pumps for profitable farms, grinding mills for grain, refrigeration, and tourism. Diverse revenue streams can support a microgrid that in turn provides electricity to village households for lighting, cell phone charging, refrigeration and potentially, new businesses, and social services.”

Finally, efficient payment methods are key to the financial success of community microgrids. Gham Power – the first "pay-as-you-go" renewable energy company in Nepal – uses smart meters with mobile prepayment in all of its projects, ensuring steady income and discouraging energy theft.

Aside from its energy expertise, Gham Power has invested considerable efforts in fundraising, identifying new sources of revenue to finance its distributed energy projects. The company wanted to figure out how to reduce risk by mixing capital from outside investors into its projects. Gham Power"s internet-savvy fundraising staff wasted no time harnessing digital strategies to attract private contributions from the international community. Their target audience is the mountain-loving tourists who have visited Nepal to trek on its trails and climb its magnificent peaks.

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