Rural communications finds its place in the sun

Solar power could transform rural lives and, with the right business model, it could also pay for itself quickly and make money for operators; Anil Raj, CEO of telecom equipment maker VNL, tells us why this idea is eminently feasible

A village site deployment with WorldGSM

"THE DIESEL GENERATOR is normally a very reliable piece of equipment which will give you many years of service – if it is operated and maintained with an attitude of religious devotion. You have to change the air filter regularly. You have to be careful about the quality of the fuel that you use. You have to change your fuel filters regularly. Every 100 hours you have to basically disassemble your fuel injection pump. If you do this you will be rewarded with long financial life and reliable duty. Now of course this doesn't happen, and what you have is equipment which is sub-optimal, which consumes a lot of power and which will be a heap of rusting scrap very soon at a huge cost to the operator."

So if Anil Raj, CEO of telecom equipment maker VNL, is right, and you're looking for a base station to connect your village to a mobile network, powering it with diesel may be economically unfeasible. But for rural dwellers, in areas where supply from the grid is unreliable at best, what alternative is there?

VNL offers a system to extend the GSM network into rural areas using a reliable, cheap and clean power source: the sun. At its heart is a solar-powered base station. Currently, VNL's focus is on Asia, but the company plans to take its WorldGSM system wherever demand and opportunity allow. And that's because the problem with extending mobile communications to rural areas is usually the same in much of the developing world. As Raj puts it, "The barriers to entry are really not the phone cost or the service costs. The barrier is that there is no coverage [and] the fundamental problem that we're solving is that there's no infrastructure for power in these areas."

The low expenditure involved in running a solar-powered base station could make it feasible for a community to finance its own telecommunications operation in a village

Meeting base needs

To keep power requirements low the data speeds are limited. That is entirely in tune with the needs of the market where, Raj says, "the main focus is definitely going to be on voice - initially and even in the medium term". Those power requirements are not great. Each base station needs only 50-120W compared to the 3000W required for traditional GSM. Each site can be powered by a 2-8m solar panel, rather than the 200m panel required to power a traditional GSM base station. Also, the base station does not require a shelter or air conditioning, further reducing power consumption and costs.

But even if the power problem is solved, setting up a normal base station can be a complicated process requiring engineering expertise. With VNL's solar-powered alternative, however, it's largely a matter of first aligning the photovoltaic panels to the sun. After this, you align the microwave antenna. For this a beeping sound guides you: the closer you get to lock, the faster it beeps and when you achieve lock it switches over to a constant fixed tone. The network then does a handshake with the base station, downloads whatever parameters and configurations need to be downloaded, and once the beeping stops the base station is ready for service.

"From the time that the boxes arrive in the village till the time you can make your first phone call takes roughly six hours," says Raj.

Still, even this sort of base station can cost around $5,000. So how does a small village actually pay for it? Microfinance could be the key. It is already used in many countries by rural cooperatives for 'big ticket investments' such as irrigation pumps or harvesters; in this way the entire community shares the benefit and the risk.

"I can see this same model being very successfully applied to the base station," suggests Raj. However, he goes further. The low operating and capital expenditure involved in running a solar-powered GSMWorld base station could make it feasible for the community to finance its own small telecommunications operation in the village. "So all the operator would need to provide is connectivity and billing," Raj explains, "and the village would then, under the franchise of the operator, set up its own little base station covering their village and bear the investment and the running costs themselves." ✆

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