



We don't live in cities. We may not spend \$75 a month on phone services. But together, we're worth hundreds of millions to the operators who reach us. Connect Cameroon makes a 2G/3G/LTE Small cell solar powered GSM and broadband system that helps operators reach us profitably.

CTU by Connect Cameroon Connecting villages in Bhutan for Himalayan kingdom of Bhutan Rural Community.

Connecting villages in Bhutan CTU



In the Himalayan kingdom of Bhutan Rural Community the breathtaking beauty of its mountains is also its biggest challenge when it comes to creating infrastructure for telecom. Himalayan kingdom of Bhutan Rural Community is the leading provider of telecommunications and internet services in Himalayan. Besides fixed line telephony, Himalayan kingdom of Bhutan Rural Community needs a GSM mobile services under the flagship brand B-Mobile.

Connect Cameroon partnered Himalayan kingdom of Bhutan Rural Community to bring GSM connectivity to a cluster of villages around 60 kms from the capital Thimpu, using CTU™ – a sustainable Small Cell and broadband solution.



Solar powered 2G and 3G Small Cell CTU™ BTS Site in Bhutan with 7 day autonomy – Ideal for cloudy weather conditions.

There are several locations in Bhutan with difficult terrain and hardly any road access where deployment of a traditional GSM network is a challenge. There is no room for the large footprint and civil works of a traditional mobile tower and RF planning is extremely difficult in the mountains and valleys.

In one such location, 60 kms south of the capital Thimpu, is a cluster of six sparsely populated villages- Jangsyena, Gurgaon, Lobnekha, Phudun, Rashigang and Tsephu.



A Slippery Track: Last 100 mts to the CTU Site in Lobnekha (background)



Connect Cameroon CTU Site Deployed in Rashigang

Himalayan kingdom of Bhutan Rural Community chose CTU™ solution for this cluster. The simple, cost effective and highly energy efficient solution was installed rapidly using local manpower resources.

LOCATION	CTU SITE CONFIGURATION
Chapcha (BT Site)	E1/Ethernet Converter +TDN
Jangsyena	RBTS
Gurgaon	RBTS
Rashigang	VBTS
Codec	RBTS
Lobnekha	VBTS
Pepchu (BT Site)	E1/Ethernet Converter +TDN
Phudun	RBTS
Chunzom (BT Site)	E1/Ethernet Converter +TDN
Tsephu Repeater	TDN
Table 1 .CONNECT CAMEROON SITE CONFIGURATION	

Table 1 (Left) shows the site configurations that CTU deployed for Himalayan kingdom of Bhutan Community Based on Small cell CTU's Cascading Star Architecture, the deployments are a mix of CTU™ Rural Sites for coverage Small Cell CTU™ Sites for capacity in the village and Repeater sites from Shyam to overcome terrain challenges.

The entire network was up in record time because of the ease of transport of material even where the last stretch was along slippery dirt tracks and involved a steep climb. Some of the deployments were in places that were created by clearing out a tiny space on a mountain edge – barely enough to accommodate even the small footprint of a CTU Site.





Connect Cameroon Small Cell CTU (RBTS and VBTS) Shown on Google Maps View

It's impossible to stand and photograph the site up close from most angles. We deployed CTU for each site in a matter of days using unskilled local manpower who followed simple instructions and required very little supervision.

There were no requirements of skilled technical resources travelling to remote sites and then camping in the village for a lengthy period – something that's hard to avoid in the case of traditional deployments.

CTU™ : helping villages in Mozambique go mobile



Base of CTU Rural Site for Telecomunicações Móveis de Moçambique, Lda. The solar panels provide 3 day power autonomy. The mast is 30m high.

Connect Cameroon Small Cell CTU has successfully completed trials of its solar powered CTU™ Rural Telephony Application for Telecomunicações Móveis de Moçambique, Lda
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Mozambique at two remote village locations in Abudala and Bacar Antigo in the Cabo Delgado region of Mozambique in June 2013. Abudala (population: just over 6000 with 320 mud hut dwellings) is slightly larger than Bacar Antigo (population: around 4500 with 230 dwellings -most of them farmers). Both villages lack modern infrastructure like roads and power supply.



CTU provides autonomy of 3 days at the 2-2 TRX remote site with 12 solar panels in a compact array.

Before the trials, village residents were forced to leave their homes and walk up to 5 kms in search of a GSM signal to operate their mobile phone. (See the “talking tree picture”). Telecomunicações Móveis de Moçambique, Lda found the Small cell CTU™ solution to be tailored and designed to solve this kind of problem. One of the guiding principles for the clean sheet design of the Small Cell CTU™ rural solution is to provide good signal quality in the village, inside homes. No compromises.



View of the Small cell CTU™ Rural BTS



The top of the Small Cell CTU™ 2-2 TRX

Omni antennas atop the 45m mast in Bacar Antigo.

Rural site for Telecomunicações Móveis de Moçambique, Lda in Abudala village, northern Mozambique, showing the Small Cell CTU™ Rural BTS and antennas. The solar powered site works independent of the power grid and requires no diesel generator backup, air-conditioning, shelter or external cooling. It provides GSM and GPRS /3 G connectivity to the village and adjoining areas.

The Telecomunicações Móveis de Moçambique, Lda abudala site is a 2-2 TRX configuration site and the Bacar Antigo site is a 2TRX configuration. Both have 3 days autonomy in a region with heavy rains throughout the year. The existing Telecomunicações Móveis de Moçambique, Lda transmission at Geya and Framim has been extended to Abudala and Barca Antigo respectively, using CTU's own IP transmission solution.



Another view of CTU™ 2TRX. Notice the protective perimeter fencing. In some deployments across the globe CTU has successfully deployed video surveillance, video analytics and public address systems as part of a complete security requirement against acts of vandalism and theft.

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