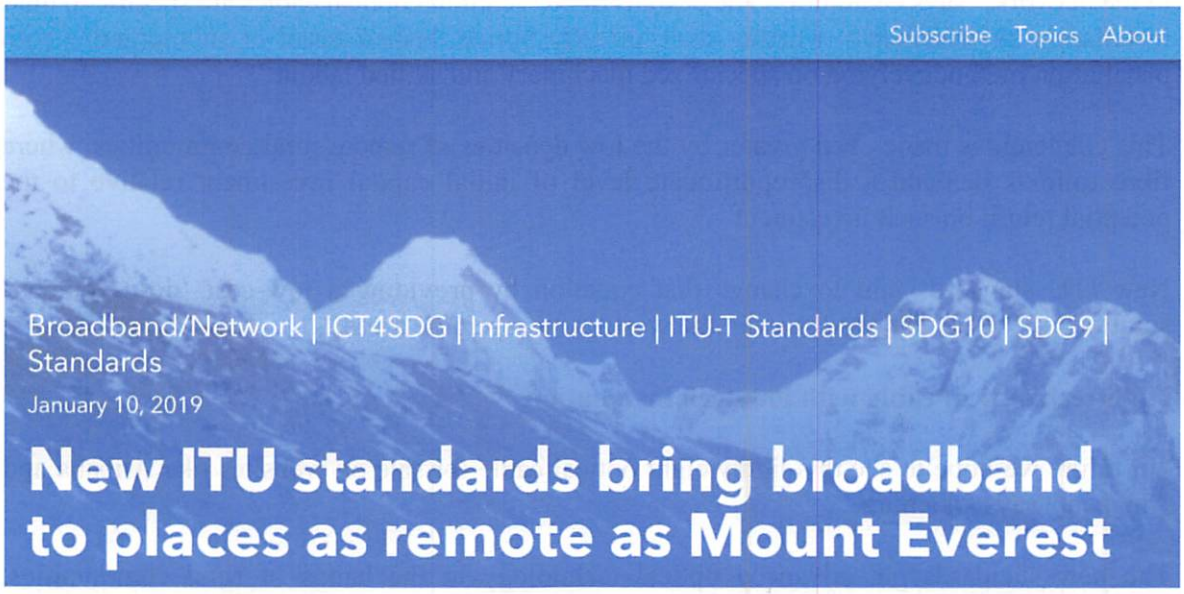

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New ITU standards bring broadband to places as remote as Mount Everest

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By ITU News

New ITU standards aim to bring high-speed broadband services to rural communities with lightweight, terabit-capable optical cable that can be deployed on the ground's surface with minimal expense and environmental impact.

The standards are giving developing countries the confidence to consider the rollout of optical networks in some of the world's most challenging conditions.

Nepal, for example, has highlighted its intention to use ITU-standardized lightweight optical cable to connect places as remote as Mount Everest Base Camp and Annapurna Trekking Trail.

Why lightweight optical cable?

Satellite communications are characterized by high latency, struggling to support the interactive services associated with broadband. Radiocommunications can provide 'last-mile' connectivity. But in the broadband era, optical infrastructure is indispensable – rural communities are often many, many kilometres away from core networks.

The Editor of the new standards, Haruo Okamura of Waseda University, offers a compelling example: "Optical cable is becoming an absolute must for telemedicine.
Only optical cable provides capacity high enough and latency low enough for the live transmission of HD medical imagery to remote medical professionals."
The installation of ultra-high speed optical networks, however, comes with a great deal of cost and complexity.

"Today the costs of optical cable installation are typically 70 to 80 per cent of the entire CAPEX of the network," says Okamura. "The designs of conventional optical cables are specific to their installation environment – whether duct, directly buried, lashed aerial or submerged – with installation methods relying on specialized machinery and skilled labour."

This challenge is made even greater by the low densities of remote rural communities, where fibre rollouts demand a disproportionate level of initial capital investment relative to the potential return on such investment.

New ITU standards aim to change that equation by providing a low-cost 'do-it-yourself' solution able to be deployed in even the world's most remote areas.

High-tech optical cable with low-tech installation

"In future we hope to see this lightweight optical cable for sale on websites like Alibaba and Amazon," says Okamura.

The new standards put advanced optical technology in the hands of rural communities, leveraging the ingenuity of local communities to overcome the prohibitive costs of traditional optical cable deployment in areas with a challenging installation environment.

"The unique feature of this solution is its focus on ease of deployment," says Okamura. "Cost-effective, practical implementation is the top priority."

Local communities will have the ability to secure these on-surface lines, using everyday tools to partially bury the lines, settle them on ground underwater, suspend them aerially, or relocate the lines as necessary.

"This is the world's first standardized solution expressly designed to narrow the digital divide," says Okamura. "It will assist us in ensuring that communications infrastructure fulfills its great potential to support the achievement of the United Nations Sustainable Development Goals."

Ascending Mount Everest with lightweight optical cable

In the Dullu municipality of West Nepal, a new project running from December 2018 to January 2019 will rollout 10km of this cable to support advanced e-health and e-education services.
"At high altitude and in volatile weather conditions, the deployment of this optical cable in Nepal is expected to form a case study of great value to other countries interested in deploying the solution," says Okamura.

Alongside Nepal, countries showing interest in the solution include Tanzania, Rwanda, India, DR Congo and Bhutan. The motivations behind this interest are documented in an appendix to the latest standard in the series, ITU L.163.

Download the standards free of charge

ITU L.163 focuses on the installation, maintenance and repair of lightweight optical cable, addressing factors such as cable tension and temperature, cable-route planning, and the selection of cables and cable-installation schemes.

The recent approval of ITU L.163 completes the series of standards, following the rural communications framework provided by ITU L.1700 and the optical cable design specified by ITU L.110.

ITU L.1700 builds on established technologies to identify the founding principles for low-cost, sustainable broadband backhaul infrastructure, with a special focus on rural communications in developing countries. ITU L.1700 is largely technology-neutral, providing the framework for technology-specific standards such as ITU L.110.

The design of the optical cable specified by ITU L.110 builds on lightweight submarine-cable technology originally targeted towards lakes and wetlands. The technology has proven its worth in Japan, where the last 20 years have seen the deployment of over 20,000 kilometres of this form of optical cable. ITU L.110 has adapted this design to terrestrial deployment, taking an established technology and giving it new life in a new application environment.

ITU L.163 and L.110 are under the responsibility of ITU-T Study Group 15 (Transport, access and home). ITU L.1700 is under the responsibility of ITU-T Study Group 5 (Environment and circular economy).