Low cost solution for broadband deployment in developing countries

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Trend in Mobile Handsets
Mobile Phones to Smart Phones & Tablets

2013

Population	7.3 B
Mobile Phones	6.4 B

2013 **>256 kbps**

Developed Countries 51 %

Developing Countries 8 %

2018

Population	7.5B
Smart Phones	4.5 B

BroadBand will be really needed to connect rural, remote areas

"Quality" in e-Diagnosis e-Education

Broadband “Backhaul”
From Cities to Rural Areas

LTE, 4G

Microwave

Optical Fiber

Trank Line

Mobile Base Station
TeleCenters, Schools
Hospitals,,,

Microwave ? Optical Cable ?

Microwave Solution

Data Capacity < 1 Gbps (Upgrading difficult)

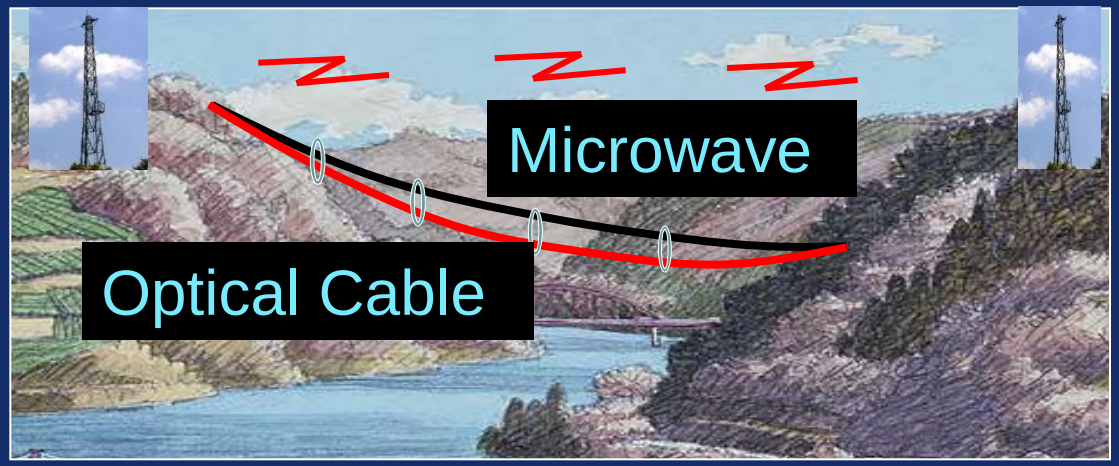
Antenna spacing : direct view, a few kilometers

(Air Transmission with Tower, Antenna and Power)

Optical Fiber Solution

Data >> 1 T bps

Cable Span > 100 km



Technol. is Available for long-span air link

Electric High-Voltage Power Line (History:130Y)

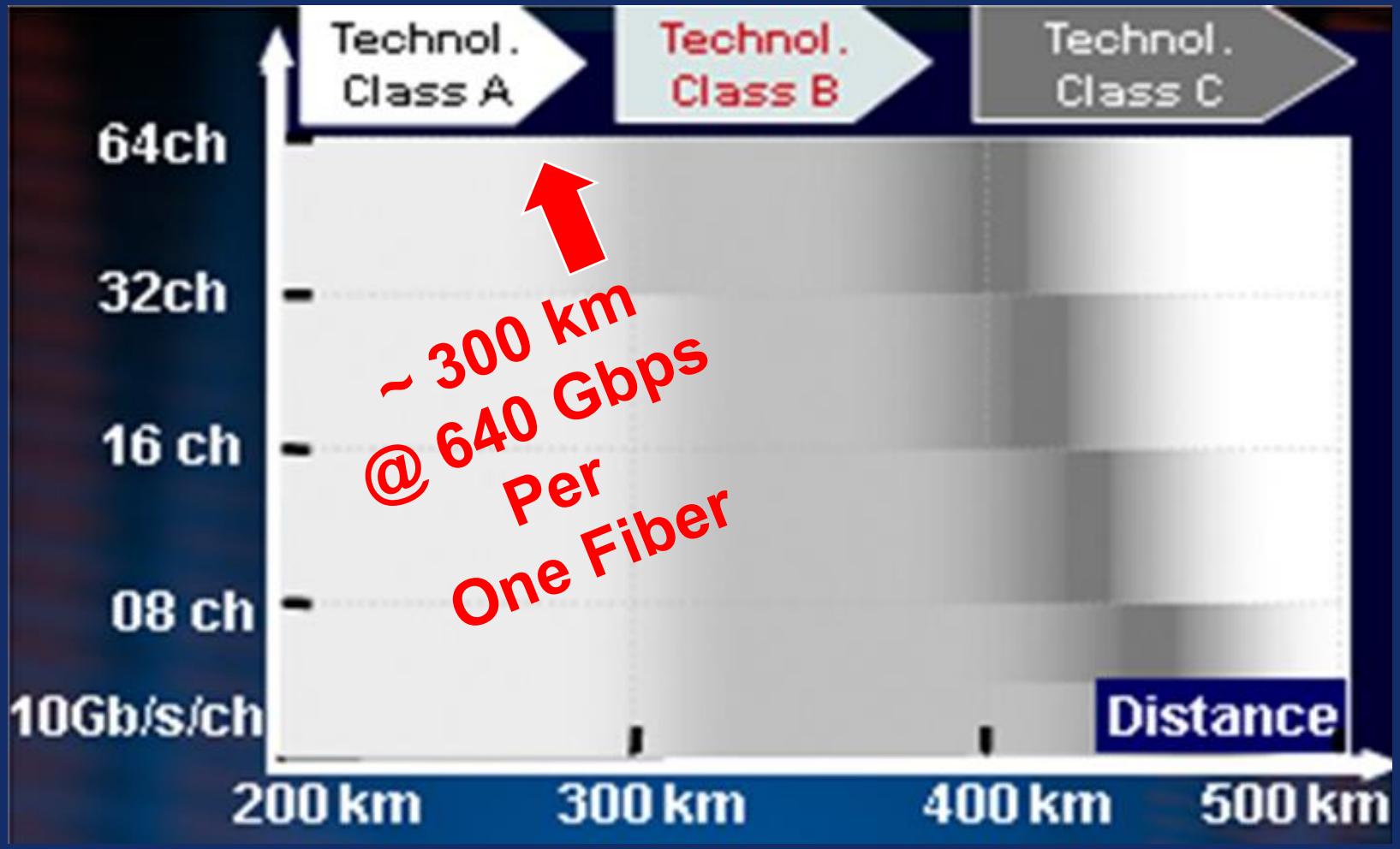
Span Ave. 630m

Rope Way span

Max. 1.7 km (Japan)

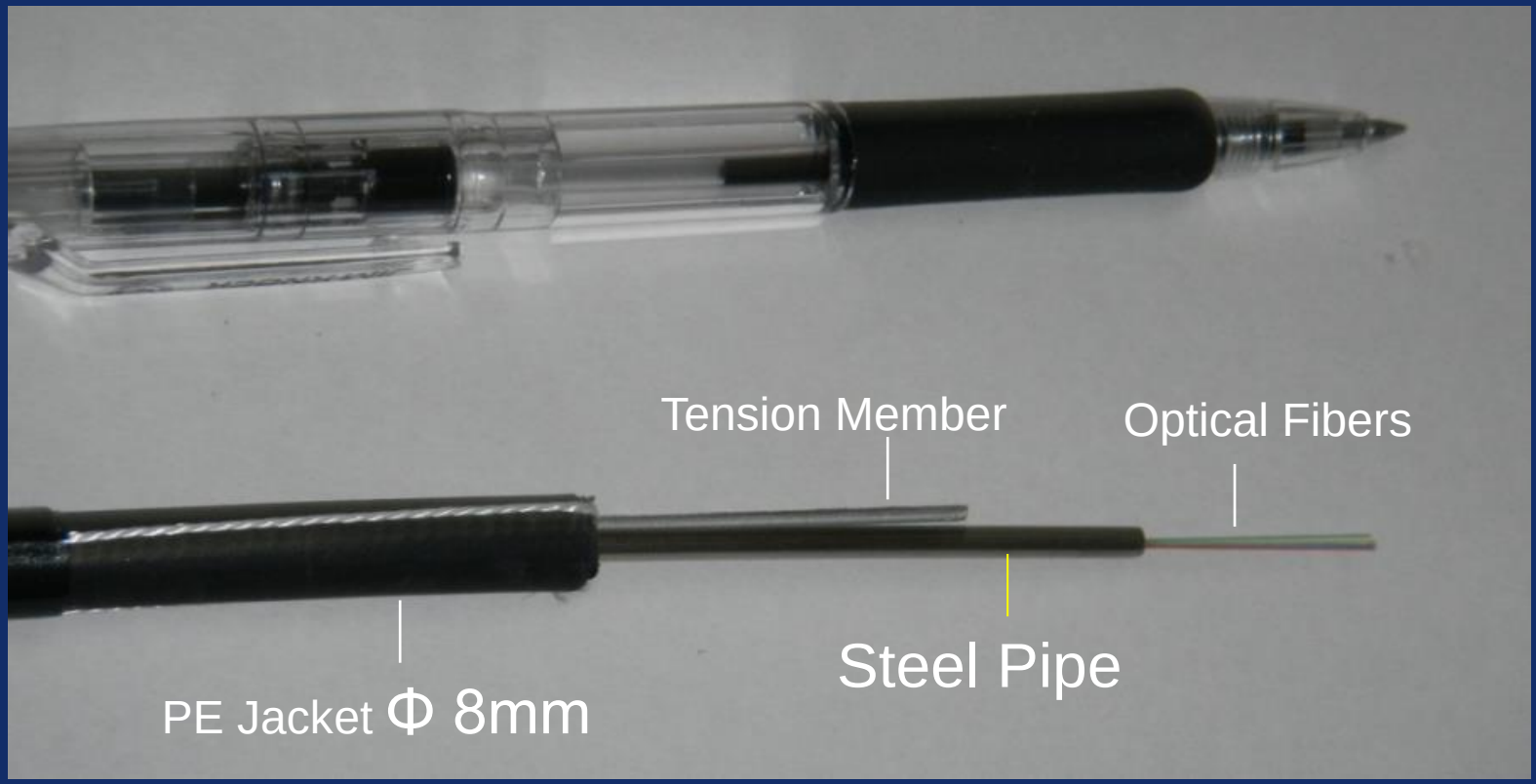
Optical Cable Solution

Signal Capacity vs. Transmission Distances without demanding Electric Power Supply



Optical Cable for Multi-Form Installation

Metal Pipe + Tension Member

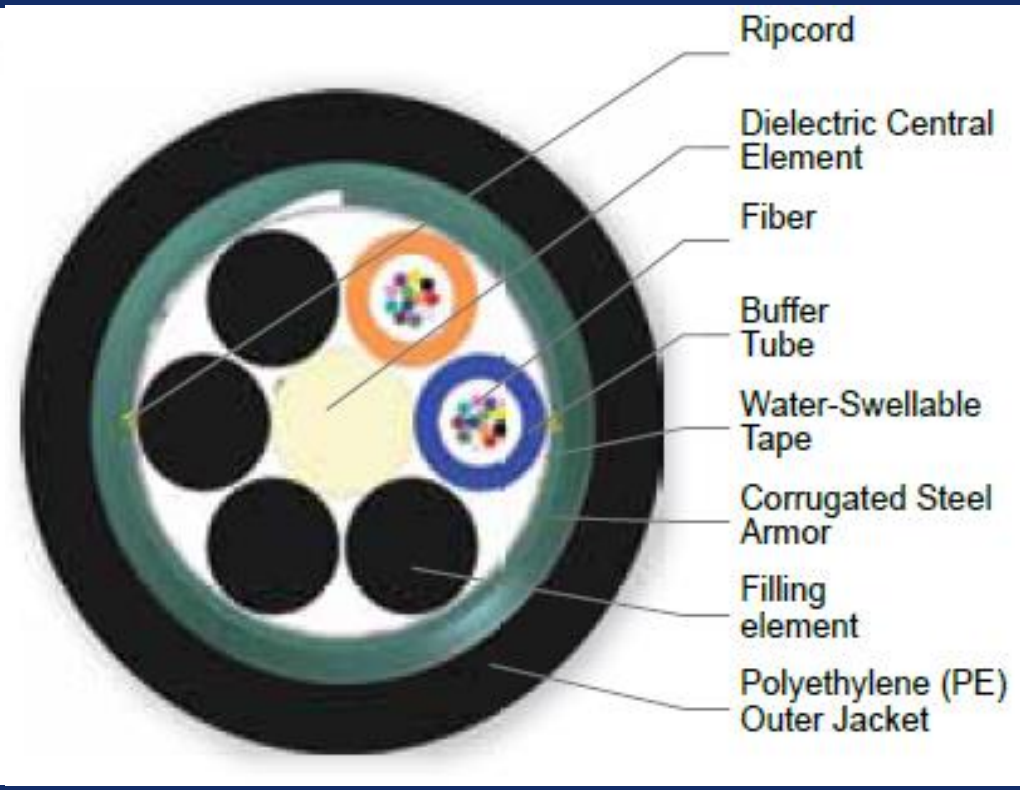


Outer diameter	Φ8 mm
Tensile Strength	90 kg
Lateral pressure	200kg/100mm
Weight	85 kg/km

Optical Cable for Direct-Buried Installation

with corrugated steel armor

Fiber count: ≤24, Weight 129 kg/km



Fully waterblocked for direct-buried installation

Outer diameter	Φ12.1 mm
Tensile Strength	90 kg

Thin and Lightweight Cable

Cost-Effective Easy Cable Laying Enables "Do it yourself"

Multiple Links to secure Optical Cable Backhaul

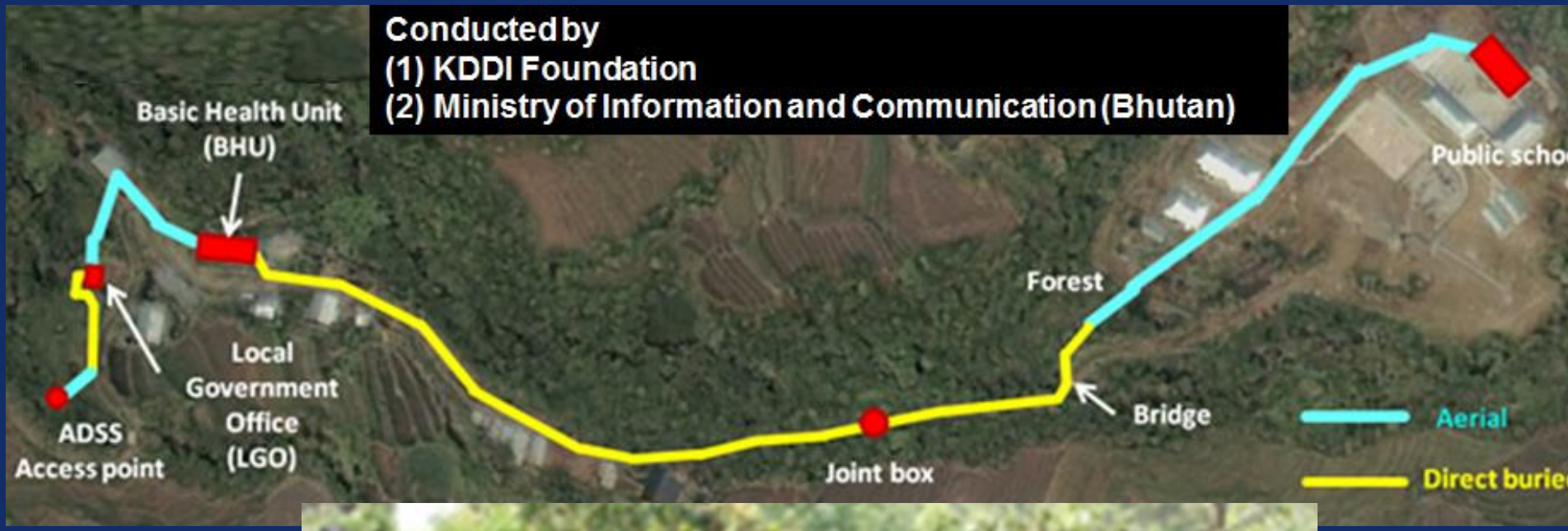
Wi-Fi

Mobile Base Station

Multiple Cables conquering e.g., difficult terrain

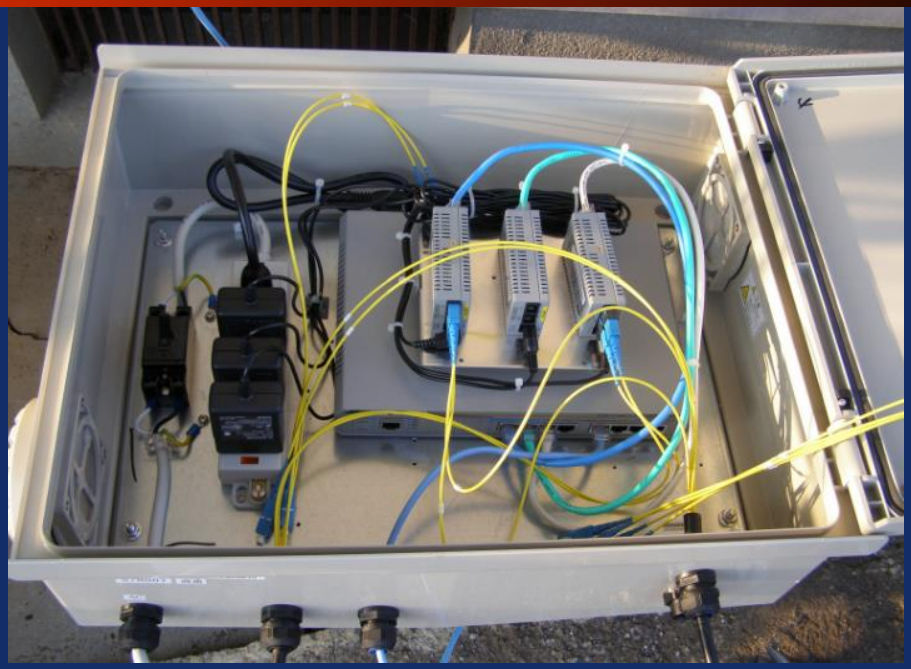
A Project in Bhutan, March 2013

4-day construction for 1.2 km



Transmission Equipment (Outdoor)

Optical Cable



Air-conditioning not needed.

- **Anti-corrosion film**
- **Moisture absorber**

can be used, where necessary.

OPTIC FIBER CABLE PROGRAMME

Pictures from

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Now Making the Solution Standardized

(1) Best Practice Example

(2) Requirement for Cable and Equipment

INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2013-2016

COM 5 – C 196 – E
December 2013

English only
Original: English

Question(s): 15/5

STUDY GROUP 5 – CONTRIBUTION 196

Source: ITU Association of Japan

Title: Proposed best practice text for Handbook on setting up a low cost sustainable telecommunications infrastructure for rural communications of developing nations

Abstract

Innovative optical cable solution allows easy and quick penetration of broadband backhaul into rural and remote areas in developing countries at a low cost. It supports nearly unlimited high-speed use of internet devices including 4G and LTE mobile devices at rural areas in developing countries.

(1) Innovative Optical Cable

The optical cable used is Thin-Light stainless steel

exposure

very and quickly deployable

No electric power supply is needed over >100 km.

vehicle, small fishing boat or even a helicopter can quickly lay the cable.

Shallow burial of the cable underground by using handy spades and picks would secure the link.

(2) Transmission Equipment

Mass-produced Low-cost Standard Equipment (mainly media converters) can be used that does not

SG05 Q14, low-cost green telecom infra. for rural, develo
SG15 Q16 Outside plant and related indoor installation

Summary (1) Everything is already available

(1) Innovative thin, light, long, robust Optical Cable allows continual multi-form installation meeting multiple societal/geographic/climatic requirements thus minimizing construction complexity and cost

A new-category cable for direct burial, under water, open-air, long-span suspension (over river, valley, mountain etc.)

(2) Equipment: Media Converter (Commodity product)

(3) Fiber Mechanical Splicer: no high skill needed without removing fiber primary coating

(4) Easy Understanding Video Manual

Do-it-yourself, grassroots solution

Summary (2) Lets take Action

(5) Identify Local needs & environ't to design solution and implementation for each region;

Services: eHealth, eEducation, eAgriculture, ,,
Route & Installation : terrain, climate, infra., popul. density
Operation & Maintenance : their availability, human resource

(6) Standards: for quick/wide broadband penetration economies of scale, justification for introduction

(7) Phased approach to connecting Internet From region, to nation-wide, to global

Thank YOU

Japanese Grant and/or ODA
may be available,
if we jointly come up with
a broadband field-test plan that
can remain while gathering data of
later operation and maintenance

Plans are being discussed at
Myanmar, Kenya, South Africa and Nicaragua

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