GrameenPhone’s Fibre Optic Network (FON): Its Scopes and Possibilities to offer Nationwide Connectivity

A.M.M. Yahya
Director, Fibre Optic Network Division
GrameenPhone Ltd., Bangladesh

Workshop on Nationwide Internet Access and Online Applications
Dhaka, Bangladesh
May 22-24, 2004
Contents:

- GrameenPhone Ltd.
- Fibre Optic Network (FON) Division
- Fibre Optic Network (FON)
- Last Mile Solution
- GrameenPhone’s (GP) Nation Wide Telecom Backbone Infrastructure
- Available Telecom Backbone Infrastructure for Nation Wide Connectivity
GrameenPhone Ltd.

November 28, 1996:
• GrameenPhone (GP) was offered a cellular license in Bangladesh by the Ministry of Posts and Telecommunications

March 26, 1997:
• GrameenPhone, 1st GSM Company, launched its service on the Independence Day of Bangladesh

After seven years of Operation:
• GrameenPhone has more than 1.6 Million subscribers as of May, 2004 with more than 60% market share.
GrameenPhone Ltd. (contd.)

The Purpose:

• GrameenPhone (GP) has a dual purpose: to receive an economic return on its investments and to contribute to the economic development of Bangladesh where telecommunications can play a vital role.

The Strategy:

• GrameenPhone’s basic strategy is to extend coverage to both urban and rural areas.
GrameenPhone Ltd. (contd.)

Contribution to National Development:

- Contribution to National Treasury: Taka 13,601,722,062 (up to 2003)
- Contribution to Bangladesh Railway (BR) only: Taka 619,053,061
- Small Enterprise business originated
- Rural Economic Development - Village Phones (53,620 subscribers)
- Proliferation of ICT through the use of Fiber through sub-lease
- Job directly created for more than 1000 in GP, 140 in BR, more than 50,000 indirectly with Dealers, Agents etc.
Fibre Optic Network (FON) Division

July, 2003:

- Fibre Optic Network (FON) Division was created as full-fledged Division from July, 2003 to manage the Fibre Optic Network (FON) and create & sell the Transmission Capacity commercially to the prospective business units/clients.

- The Management philosophy is based on shared responsibility and mutual Understanding among the people working at FON Division. Creativity and Innovations are encouraged. The Management envisages to build it as an independent business entity, eventually.

- The work of this Division comprises of 3 main units such as 1) Technical 2) Co-ordination and 3) Sales & Marketing.
Fibre Optic Network (FON) Division (contd.)

Policy of Capacity Sale:

• FON Division (GP) shall sell capacity at E1 PCM level only & Would not provide last mile connectivity. The Division (GP) shall refer all clients of channel level requirement either to Its Strategic Partner (X-Net) or the Dealer /Agent (Ranks ITT).

• GP (FON) would determine the selling price (highest) and the rate of discount to be given on the basis of volume and duration of contract of the E1 PCM.

• X-Net and Ranks-ITT would sell capacity at channel level only providing Last Mile Connectivity (LMC). Choice of LMC provision and the price for the last mile connectivity shall be determined by X-Net and Ranks ITT.
Fibre Optic Network (FON) Division (contd.)

**Policy of Capacity Sale** (contd.):

- Price of selling at E1 PCM shall be cheaper than selling at channel level.

- FON (GP) shall arrange a common point of termination beside the GP Installations for E1 PCM customers, including X-Net and Ranks ITT.

- FON (GP) would provide DC supply to FON customers subject to availability at a cost determined by GP for such power.
Fibre Optic Network (FON) Division (contd.)

Some of the clients to whom Nationwide Internet Access and Data Connectivity provided:

1. Grameen Communications Ltd.
2. Siemens Bangladesh Ltd.
3. Aventis Ltd.
4. Plan International Bangladesh
5. Techno Online Ltd.
6. Srimongol Online Services
7. Southnet Online Ltd.
8. Bangladesh Express Co. Ltd.
9. BRAC Bdmail Network Ltd.
10. Polly Dot Net
11. Dragon Group
Fibre Optic Network (FON) Division (contd.)

Some of the clients to whom Nationwide Internet Access and Data Connectivity provided (contd.).

13. Lever Brothers Bangladesh Ltd.
14. DHL Worldwide Express
15. Heidelberg Cement
16. Shell Bangladesh
17. Berger Paints
18. Expeditors Ltd.
19. Mutual Trust Bank
20. IDLC
21. SBI
22. Ispahani
23. Global On-line
Growth of Nationwide Internet Access and data connectivity traffic through the Years 2002-2004:
Business Opportunity employing Nationwide GP FON Connectivity:
Areas:
• Education
• Research
• Healthcare &
• Economic Development
• ICT

To Offer:
• Fixed Telephony (Other Operators)
• Internet Services (Local ISPs, Large ISPs, Cyber Café)
• Domestic Data Connectivity (Domestic Data Service Providers)
• Distance Learning (NGOs, Universities)
• Video Conferencing (Govt. Agencies/ Offices, Ministries etc.)
• Connectivity for Utility Services (Electricity, Gas, Water Supply etc.)
• Connectivity for financial institutions such as Banks, Corporate Houses,
Fibre Optic Network (FON) Division (contd.)

Business Opportunity employing Nationwide GP FON Connectivity (contd.):

- Small and Medium Enterprises, Industries
- Bandwidth on Demand (SME, Corporate Houses, SOHO).
- Dial up mobile internet (Nationwide ISP)
- Cable TV (Entertainment/ Education etc.)
- Telemedicine (NGO, Medical & Healthcare Entrepreneur).
- Terrestrial Video Broadcasting (Private TV Broadcasters).
- Internet Exchange (ISP and VoIP licensees).
- Call Center (GSM, PSTN subscribers, Telco).
Fibre Optic Network (FON) — used for Nationwide Internet Access and On-line applications

• The word “Internet” derives from Inter-Net working, meaning the inter-connecting of networks. This defines the Internet in abroad sense.

• The Internet is based on a TCP/IP network called NSFnet, which was financed constructed by the U.S. National Science Foundation (NSF) to promote research and education.

• First online Internet service was introduced in Bangladesh in 1996

• Access Network: consists of two parts from the network function. One is “Transit network” and the other is “Access network” GrameenPhone Fibre Optic Network (FON) has been used as “Transit Network” for Nationwide connectivity.
Fibre Optic Network (FON)

• For the purpose of building a Nation wide Telecom Backbone Infrastructure for its own use, GrameenPhone (GP) acquired the Optical Fiber Network of Bangladesh Railway (BR), back in 1997 through a lease contract for 20 (twenty) years from the date of signing.

• GrameenPhone Nation Wide Telecom Backbone Infrastructure has been built on SDH Fibre Optic Network (FON) and Microwave Radio Links. SDH Fibre Optic Network refers to a group of fibre optic transmission rates that can transport digital signals with different capacities.

• Total length of GrameenPhone Optical fibre is now about 2000km (2004) and the maximum capacity is STM-4 (622Mbps, 252 E1 PCM), ready for upgrading to STM-16 (2488 Mbps, 1008 E1 PCM).
Fibre Optic Network (FON) (contd.)

Why GP’s Fiber?

• Nationwide coverage
• Technical expertise
• Robust network
• Minimum downtime for non-protective circuits
• Redundant Network option
• Cost-effective
• Right of way in the Bangladesh Railway Network
• Public but yet private enough to give best negotiated prices
• Best possible option available
Advantages of Fibre over other Transmission media:

<table>
<thead>
<tr>
<th></th>
<th>Wires</th>
<th>Coax</th>
<th>Fiber</th>
<th>Microwave</th>
<th>Radio</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Possible Contention</td>
<td>Fair to Good</td>
</tr>
<tr>
<td>Expandability</td>
<td>Fair</td>
<td>Good in local area</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Errors</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
</tr>
<tr>
<td>Security</td>
<td>Fair</td>
<td>Fair</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Distance</td>
<td>Good</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Constraints Due to Environment</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
</tr>
</tbody>
</table>
Available Last Mile Solution:

- Presently five popular broadband access technologies are available for last mile solution to Telco's: namely, (1) DSL (Digital Subscriber line), (2) Broad-band Wireless Access (BWA), (3) Cable Modem, (4) Optical fiber and (5) Satellite.

- We propose to deploy Broadband Wireless Access (BWA) technology which is most appropriate for providing last mile solution to small and medium enterprises in the local loop. It has two distinct advantages over its substitutes/alternatives: such as - it can be deployed in weeks and requires lower initial capital expenditures.
Last Mile Solution—continues

Some Constraints:

• Poor Quality of service (QOS)
• Low MTBF and long MTTR of the equipment
• Lack of adequate and knowledgeable technical skill
• Less/small Investment and looking for short term return in the last mile solution
• Lack of long term planning
• Non-availability of proper planning tool
• Using Multi-vendor equipment and facing problem of integration
GrameenPhone Nation Wide Telecom Backbone Infrastructure (Components)

GrameenPhone Nation Wide Telecom Backbone Infrastructure carries the traffic (voice & data) from point to point. It consists of three main parts as given below:

• **Local Network** - has been built on PDH MW Radio links in 15GHz & 23GHz frequency band.

• **Regional Network** – has been built on PDH MW Radio links in 7.5GHz frequency band.

• **Backbone Network** - has been built on SDH Fiber Optic Network (FON) and SDH MW Radio links.
Some Illustrations:
FON Access node at FENI local Network
Some Illustration (contd.):
FON Access node in COMILLA local network
Some Illustrations (contd.)
FON Access node in KHULNA local Network
Some Illustration (contd.)
FON Access node in NARAYANGANJ local network
Some Illustration (contd.)
FON Access node in RAJSHAHI local network

RAILWAY RAJSHAHI

RAJSHAHI

UPOSHAHR 1

LAXMIPUR 1

SHEKPARA 1

TALAIMARI 1
Some Illustration (contd.)

FON Access node in SAVAR & JAIDEBPUR local network
Some Illustration (contd.)
FON Access node in SYLHET local network

AMBARKHANA 1
SAGOR DIGHERPER 1
KAZAL SHAH 1
LAMABAZAR 1
ZINDABAZAR 3
ZINDABAZAR 1
ZINDABAZAR 2
MOHAJHON POTTI 1
BISWANATH 1

RAILWAY SYLHET

FON Access node in SYLHET local network
Some Illustration (contd.)
FON Access node in CHITTAGONG local network
Fibre Optic Network (FON) showing FON Access nodes

Legend:
- Optical Fibre cable
- SDH Radio links
- SDH Access Node
Some details of GP’s available Telecom Backbone Infrastructure for Nation Wide Connectivity:

- **Tower** – 42m (heavy) SS Tower (Qty.71), 42m (medium) SS Tower(Qty.47), 52m SS tower (Qty.30) 60m SS tower (Qty.14) 70m SS tower (Qty.07)

- **Space** – Primary 6 divisional Head Quarter. For remaining sites out door solution should be applied for Last mile equipment

- **DC supply** – in all Access Nodes.

- **Base Station/Access Node** – 749 nos.

- **FON Access Node** – 60 nos.

- **Dist./Thana Coverage** – 61/288 nos.
Q & A
Thank You