

# ***Analysis And Trends Of The Competitive Offerings From The Perspective Of The Telecom Operator To The Rural Areas***

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## **ICT Solutions for Rural Areas**

### **Aims**

- **Delivering voice, broadband Internet and e-business solutions for rural areas**
  - **Making use of existing local infrastructures (TP, CATV)**
  - **Utilising new technologies (UMTS, BWL, PLT, FSO)**
  - **Tailoring solutions to target group needs (SME, SOHO)**
  - **Offering home security, utility services, remote metering**
  - **Forming business models for viable ICT solutions**
- **Exploiting the opportunities of rural economy**
  - **ICT application in agriculture, forestry, food industry, etc.**
  - **Social, cultural & economical integration**

## **Rural areas from the network operator's viewpoint**

- Sparsely populated locations,
- Unpredictable traffic volume,
- No guarantees for ROI
- Wetlands, valleys, hills - cable installation uneasy

**Laying new copper/fibre cables - out of question today**

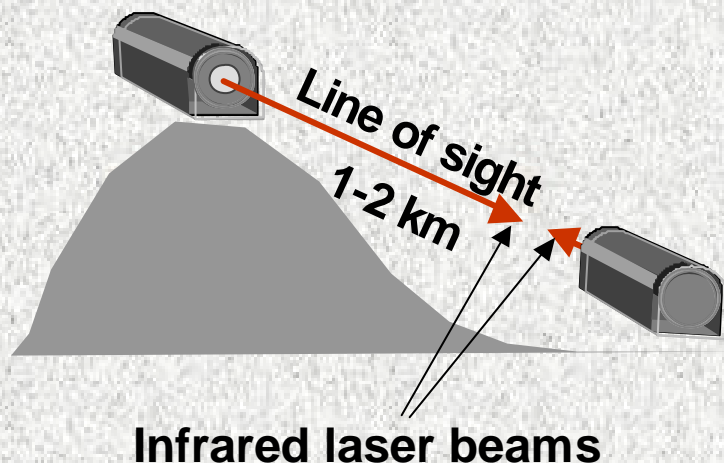
**3G mobile (UMTS): not affordable, not yet available**

**Fixed Wireless: LMDS (microwave), LEO (satellite)**

- Advantage: easy to install, short deployment time
- Drawback: high fixed costs (owing to frequency use)

**Free Space Optics (FSO) - high speed link to backbone**

- Advantage: Short installation time, no frequency fees
- Drawback: fog-sensitive, backup link is needed



## Free Space Optics

- Line Of Sight (LOS) is needed
- High speed: 10-100 Mbps (1.25 Gbps)
- Maximum distance 2 km
- Practical distance 100 - 500 m
- Sensitive to fog
- RF backup is needed

## Powerline (PLT, PLC)

Access technology for the last some hundred metres

Geographical coverage: the same that of electricity grid ( ~ 99% )

No new wires - low infrastructure costs

PLT modem prices are similar to ADSL

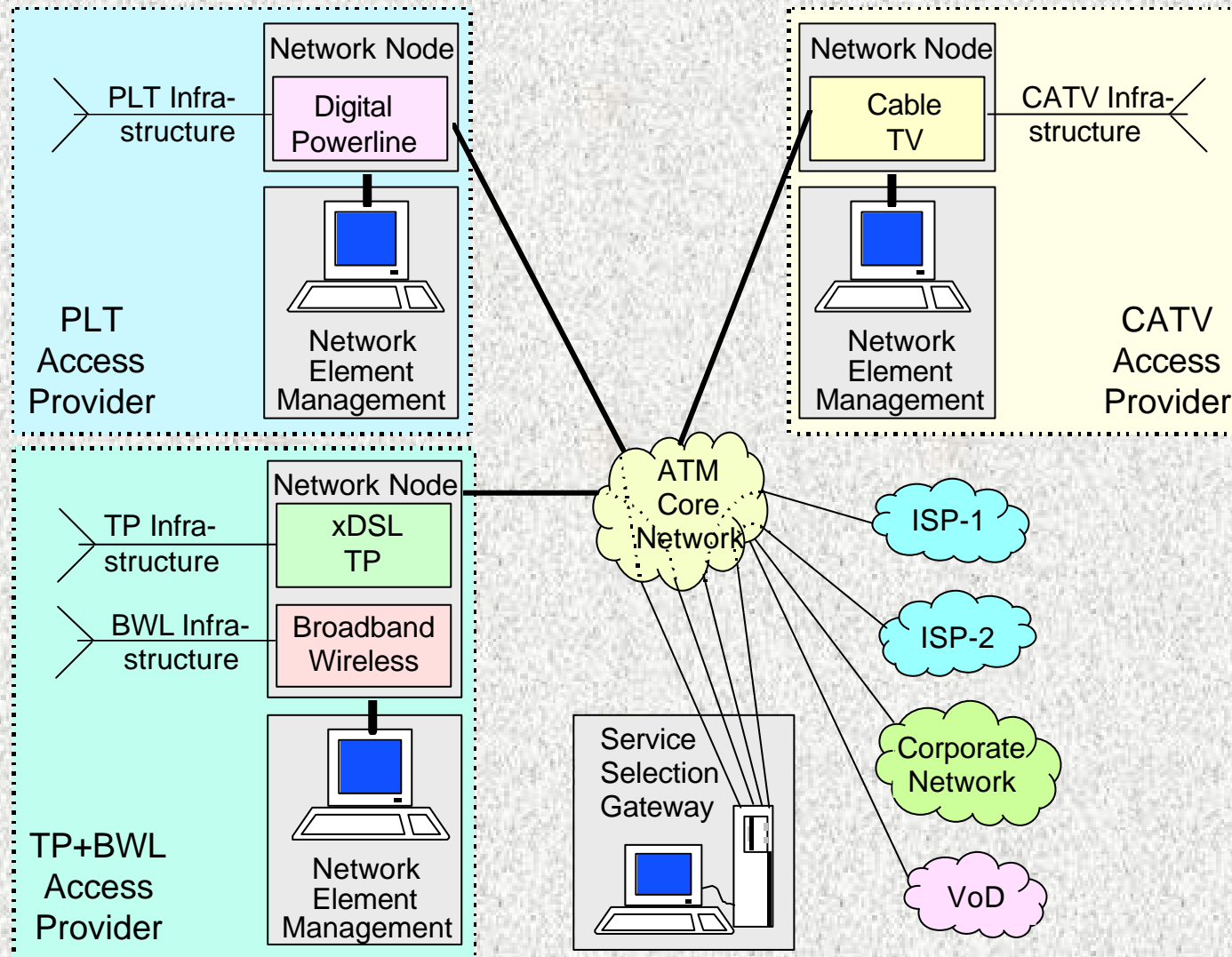
Speeds range from 2 - 4.5 Mbps (access)

until 25 - 45 Mbps (home networks)

Backhaul network may be the same as with ADSL

Pending standardisation hinders mass deployment

## Competition among Access Infrastructures and Service Providers

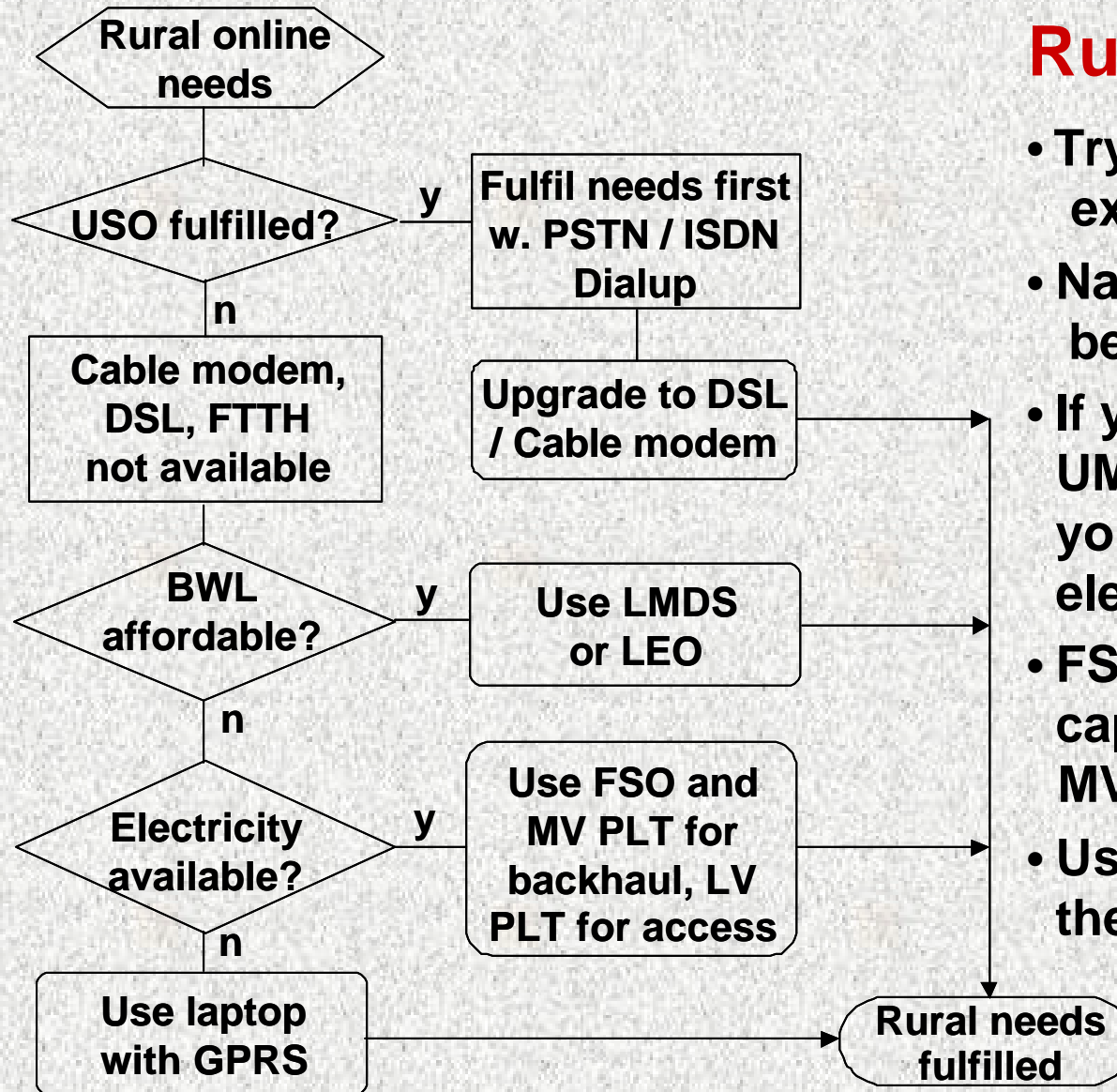


## Competing broadband access technologies today

Physical Medium	Twisted Pair		CATV Network	Broadband Wireless		LV & MV Electr. Grid	Open Air Infrared	Optical Fibre
	ADSL	VDSL		Fixed	Satellite			
Infrastructure technology	ADSL	VDSL	Cable Modem	LMDS	LEO	PLC	Free Space Optics	Fibre To The Home
Connection	P2P	P2P	Shared	Shared	Shared	Shared	P2P, P2MP, meshed	Shared
Max. distance	6 km	1 km	24 km with amplifiers	3 - 5 km radius	1500 km	0.5 km (3 km with repeaters)	200–500 m	5 km (max. 20 km)
Freq. band used	20kHz–1.1 MHz	300kHz-30MHz	5-42MHz 450-750MHz	27-29GHz	18-19GHz, 28-29 GHz	1.6-30 MHz	10-180THz	180-400THz
Downstream capacity max.	1.5 - 7 Mbps	3 - 52 Mbps	43 Mbps (50 channels) /2000 homes	300 Mbps / 80000 homes	64 Mbps shared	25 Mbps shared 4.5 Mbps p-p	10 Mbps (100 Mbps, 1.25 Gbps)	155 Mbps, (622 Mbps, 1.25 Gbps)
Upstream capacity max.	16-640 kbps	6.4 kbps-1.6 Mbps	2 Mbps (6 channels) /2000 homes	300 Mbps / 80000 homes	2 Mbps shared	2 Mbps shared	10 Mbps (100 Mbps, 1.25 Gbps)	10 Mbps (100 Mbps)
Suppliers	ILECs CLECs	ILECs CLECs	CATV Operators	ILECs CLECs	Teledesic, Iridium, etc	Utilities CLECs	CLECs	ILECs CLECs
Standardised	Yes	Yes	Yes	No	No	Not yet (pending)	No	Yes

LMDS: Local multipoint distribution service

Source: Morgan Stanley Dean Witter Research

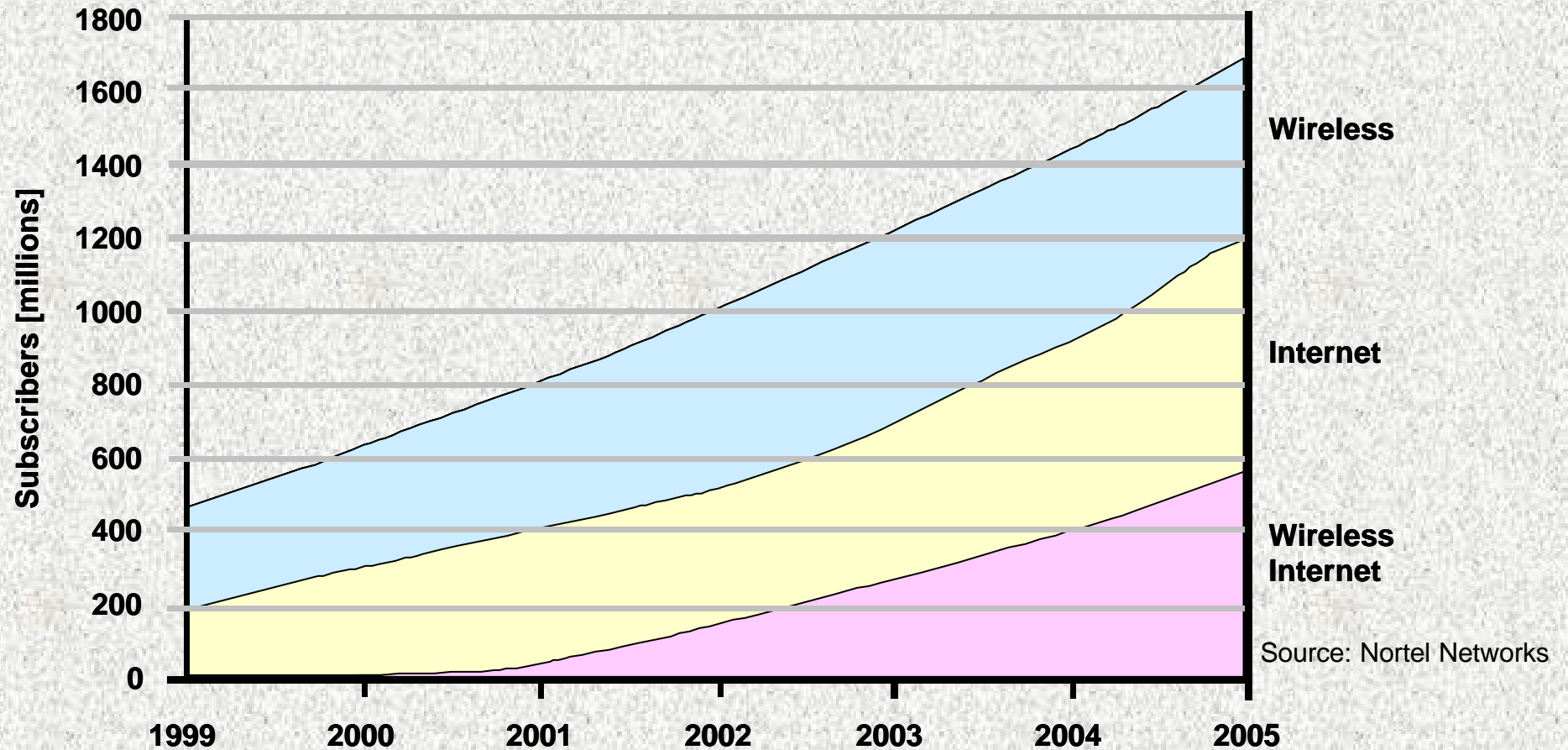


## Rural online strategy

- Try to meet needs with existing capabilities
- Narrowband online is better than "no online"
- If you can afford BWL or UMTS then use it, otherwise you have to make use of electricity grid (MV & LV)
- FSO links help avoiding capacity bottleneck in MV PLT sections
- Use your laptop with GPRS if there is no electricity supply

## Is it important for bandwidth to increase?

**Wireless Internet Will Exceed Half Billion Subscribers  
With 30% Penetration by 2005.**



## **What is the bandwidth that everyone will need in the next 5 years?**

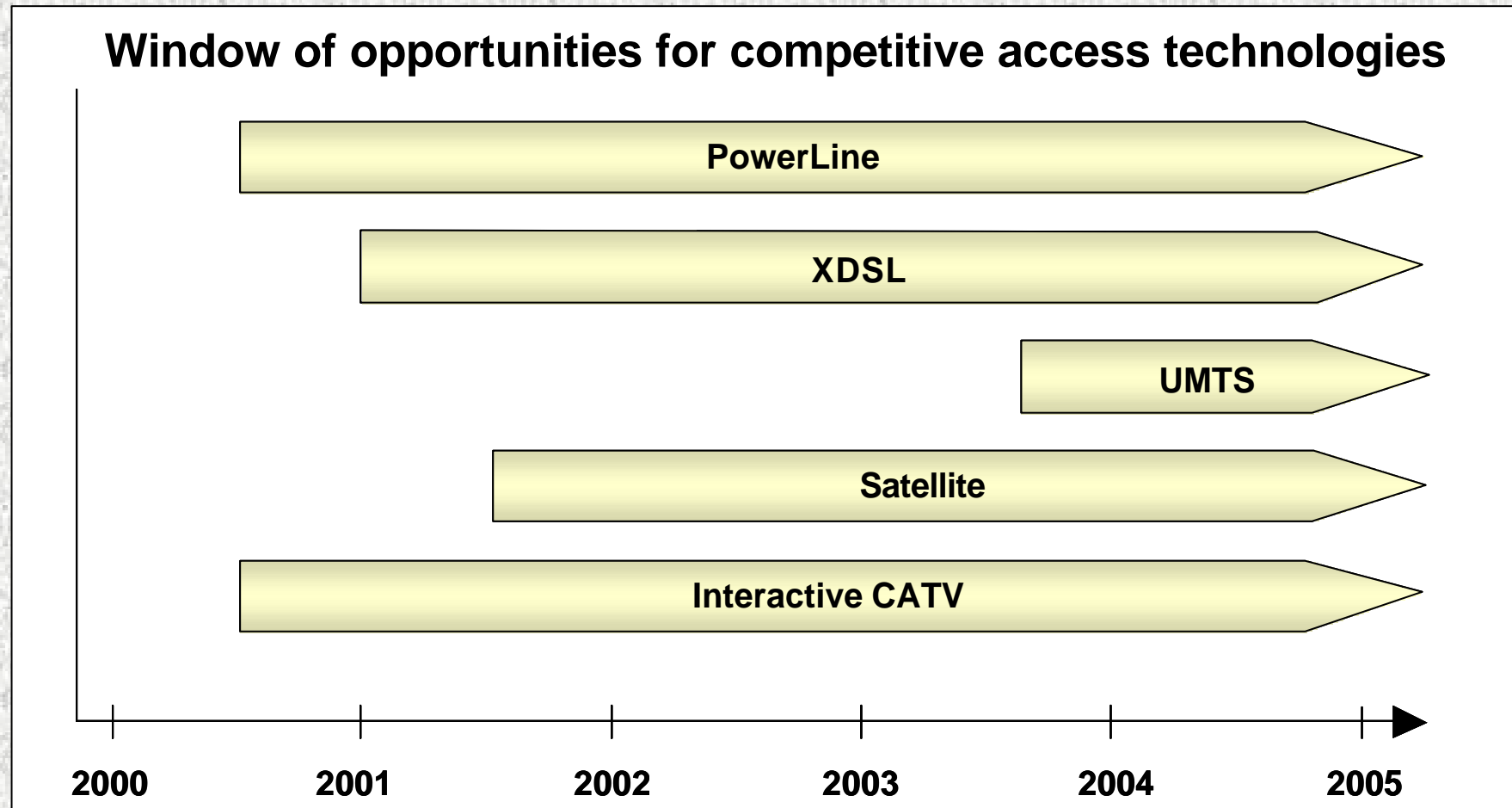
- CD-quality sound streaming at 150 kilobytes per second
- Fast Internet needs 384 - 768 kbps downstream
- Video conferencing necessitates T1/E1
- Commuters & SOHOs need n ? T1/E1

**In the US, there is 500 percent growth in network usage annually.**

**In five years, 100Mbps - 1Gbps per user will be the norm.**

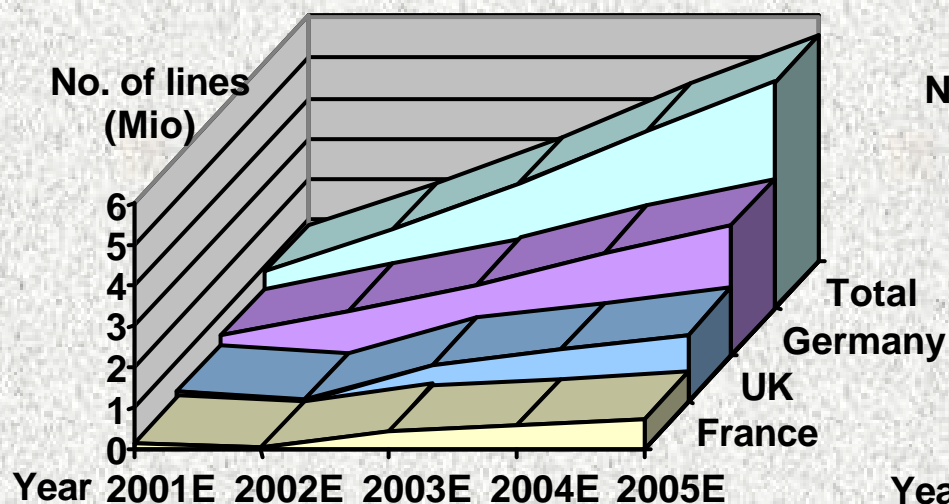
**XDSL alone cannot meet this demand (owing to copper access bottleneck). This opens an opportunity window for all competing access technologies.**

## Race of Competitive Access technologies

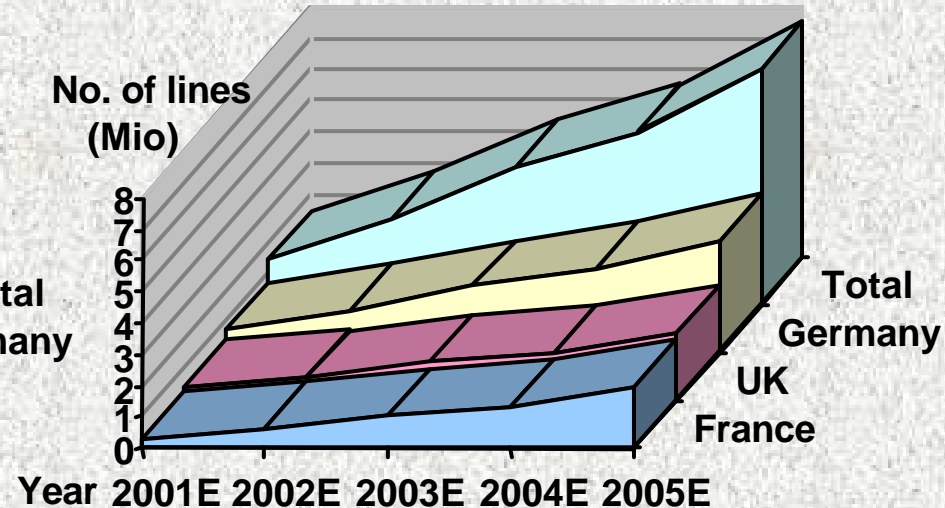


Source: PALAS

### ADSL Business Market



### ADSL Residential Market



Business market	2001E	2002E	2003E	2004E	2005E
France	163557	303890	431414	577946	734008
UK	250382	508480	896524	1273018	1661522
Germany	479533	1089457	1718654	2499474	3150056
<b>Total</b>	<b>893472</b>	<b>1901827</b>	<b>3046592</b>	<b>4350438</b>	<b>5545586</b>
Residential market					
France	340169	630360	1059579	1320090	1905363
UK	400261	768577	1246389	1501525	2157084
Germany	693108	1374745	2108275	2715666	3567208
<b>Total</b>	<b>1433538</b>	<b>2773682</b>	<b>4414243</b>	<b>5537281</b>	<b>7629655</b>

Source: Telecom Markets

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***Thank you for your attention!***

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