

What end-users desire from NGN ?

Next Generation Access

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Next Generation Access

(Future Broadband, Ofcom)

- Next generation access is still largely defined on the basis of bandwidth, other service characteristics or services that these networks can deliver.
 - For example, some definitions consider 25Mbps or more as the point that would define what a next generation access network would need to provide.
- Definition: Broadband access services that are capable of delivering sustained bandwidths significantly in excess of those currently widely available using existing local access infrastructures or technologies.

- Current generation Broadband in India
 - TRAI Reports
- World Broadband
- Broadband penetration and economic development
 - World Information Society Report, ITU, UNCTAD, 2007
- Next generation broadband access drivers
 - Future Broadband, OFCOM, September 2007
- What should India do ?

India Internet and Broadband Subscriber base

Subscribers (million)	Dec. 2004	March 2005	March 2006	March 2007
Internet	5.45	5.55	6.94	9.27
Broadband (256 kbps)	0.05	0.18	1.35	2.34
Wireless Internet (through mobile handsets)	--	--	--	31.30

MTNL

	2005-06	2006-07	2007-08
	FY	FY	Q1
Basic Wireline (incl. WLL-F)	3,877,608	3,801,510	3,750,499
- Delhi	1,621,506	1,597,683	1,583,482
- Mumbai	2,256,102	2,203,827	2,167,017
Internet connections	1,400,139	1,762,565	1,813,377
- Broadband	211,935	469,446	499,707

ISP Market share

March 2007

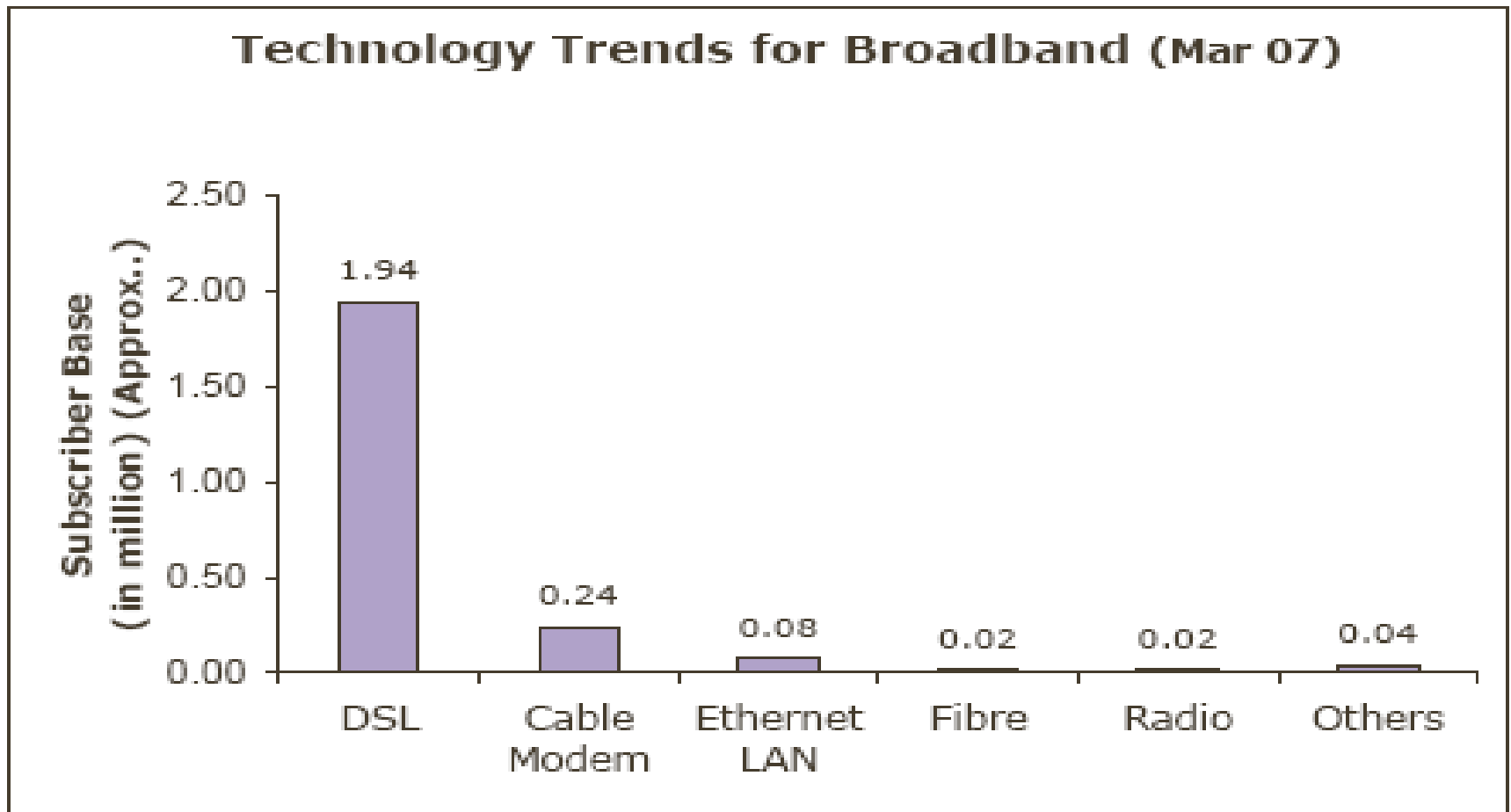
ISP	Share in %
Bharat Sanchar Nigam Ltd.	45.21
Mahanagar Telephone Nigam Ltd.	19.01
Sify Ltd.	8.89
Bharti Airtel Ltd.	6.84
Reliance Communications Infrastructure Limited	6.06

Broadband Access Potential

TRAI Reports

	Millions
Total copper loops (MTNL/BSNL)	40
Rural loops	14
Urban loops	26
Broadbandable Provision	8 1.45
Cable modem	
Total connections	71
Broadbandable Provision	7 0.25

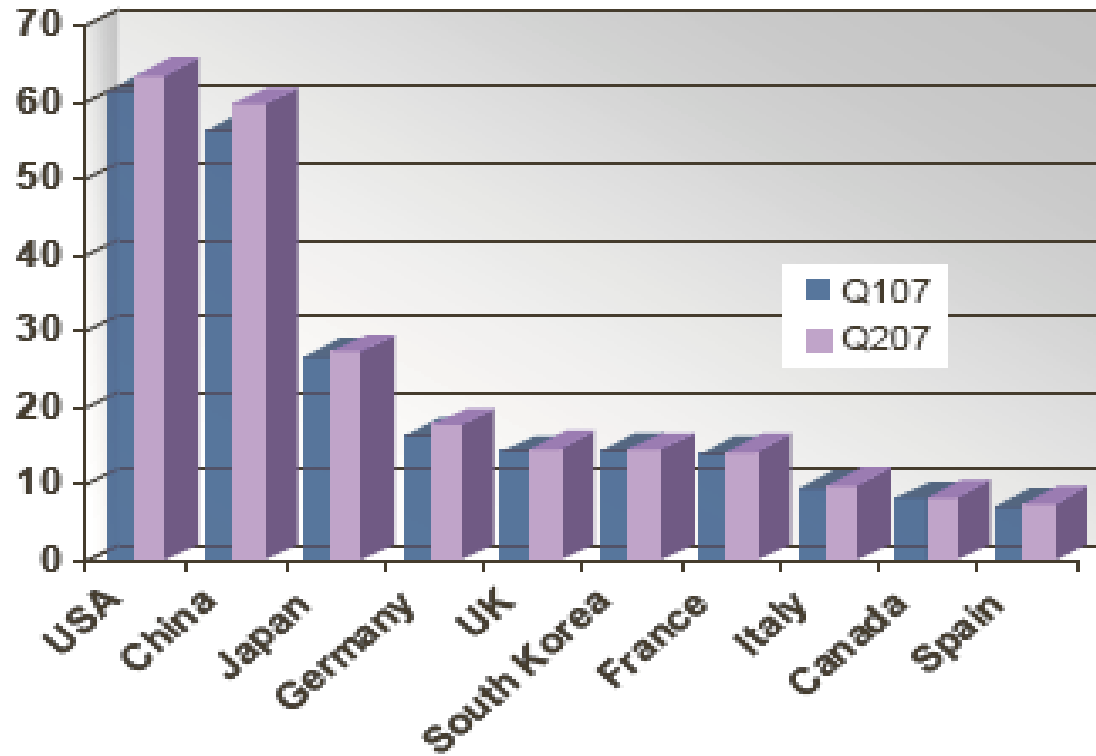
India Broadband



Broadband subscribers

(million, Point Topic, Q207)

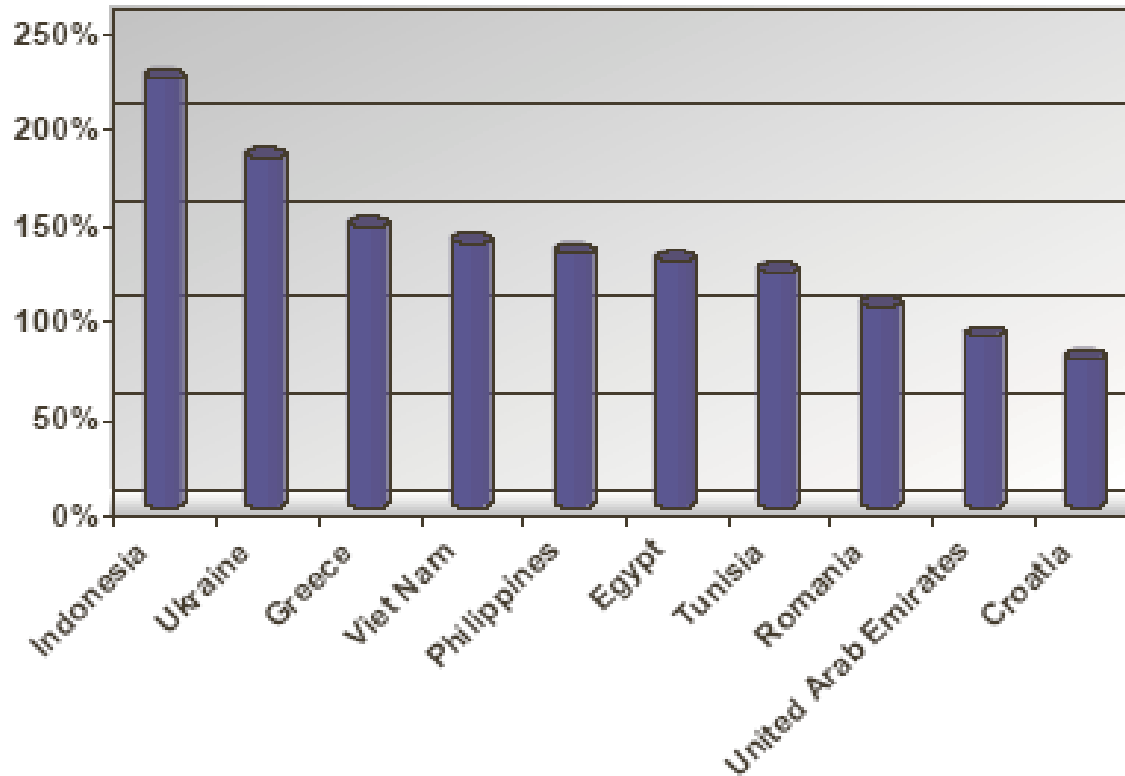
Figure 8: Total Number of Subscribers



Broadband subscribers

(Point Topic, Q207)

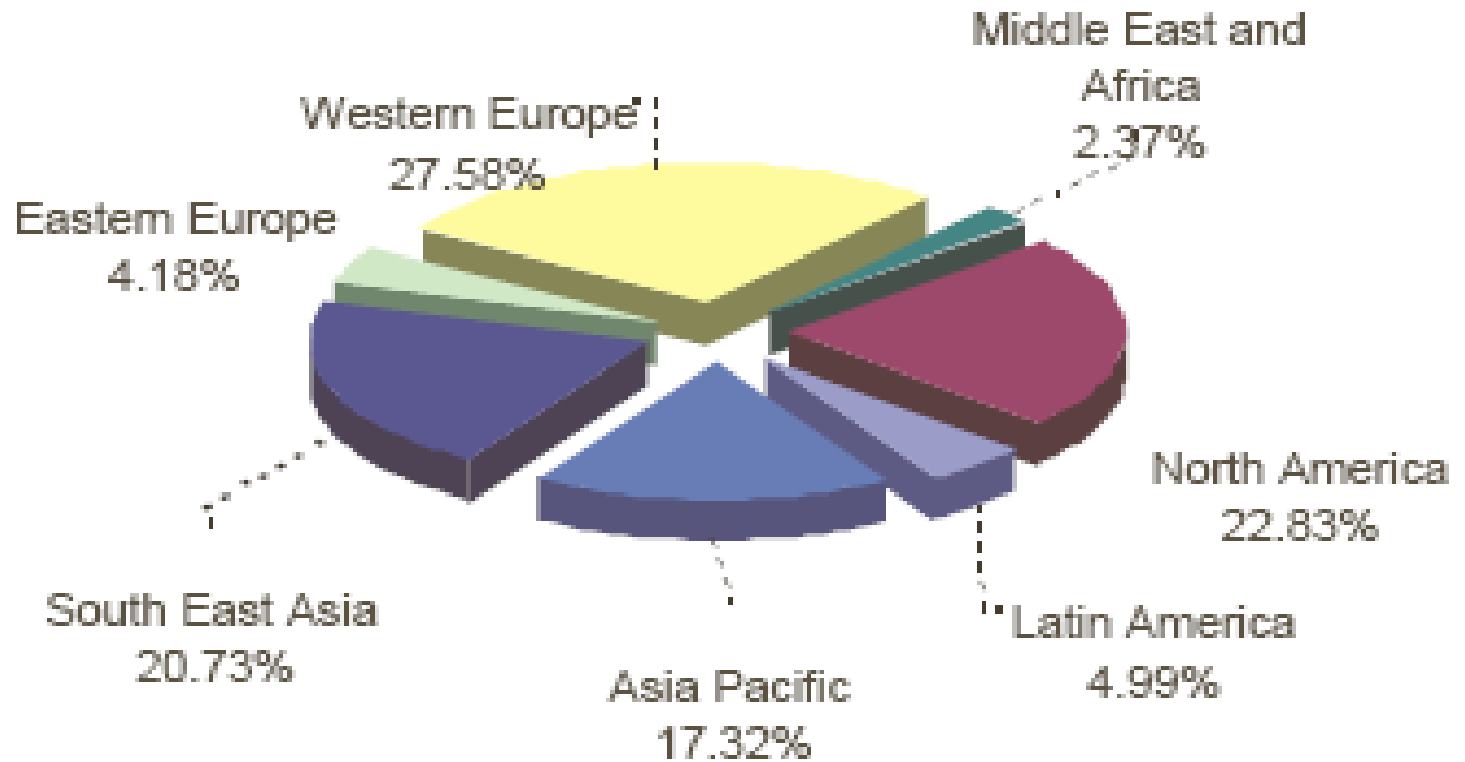
Figure 11: Top 10 Countries by Annual Growth



Broadband subscribers

(Point Topic, Q207)

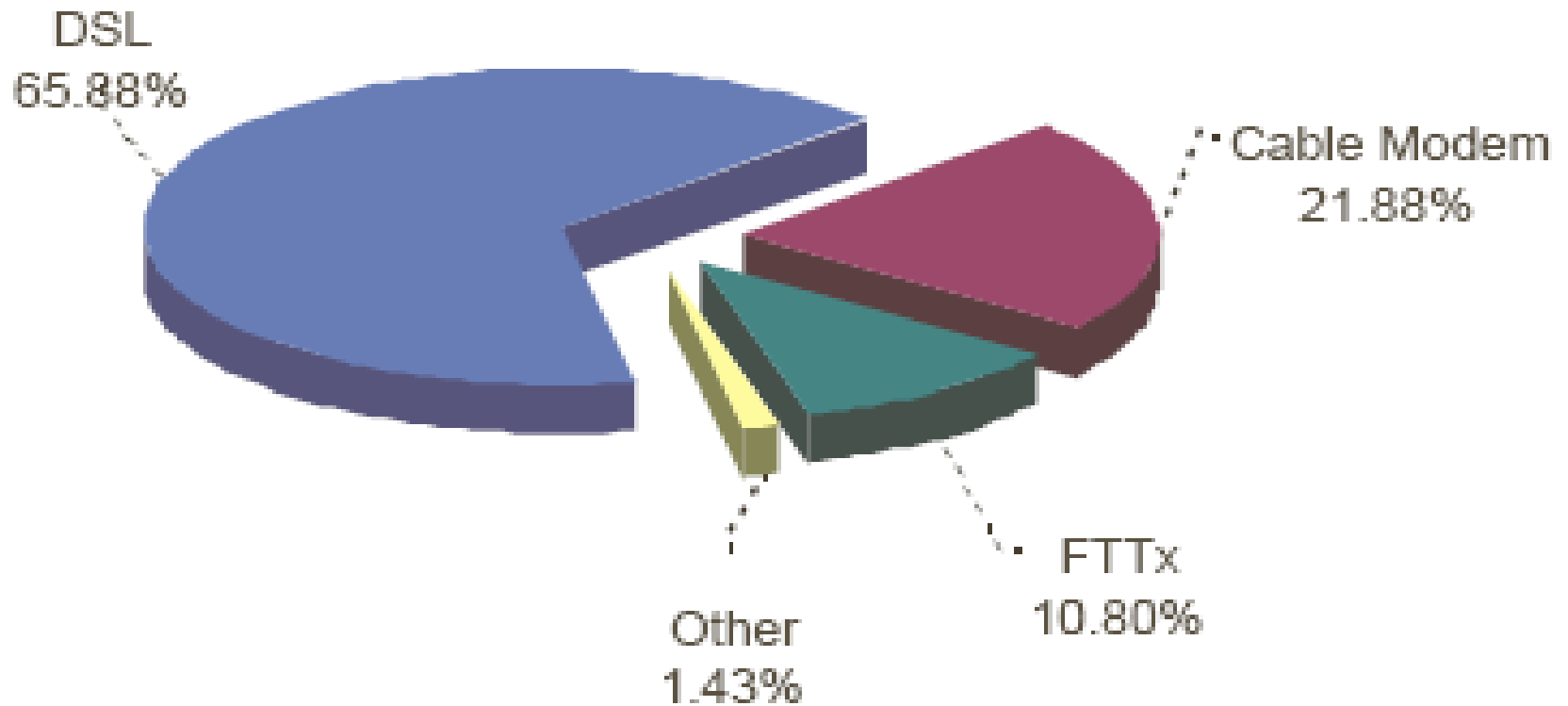
Figure 2: Share of World Broadband Subscribers by Region



Broadband subscribers

(Point Topic, Q207)

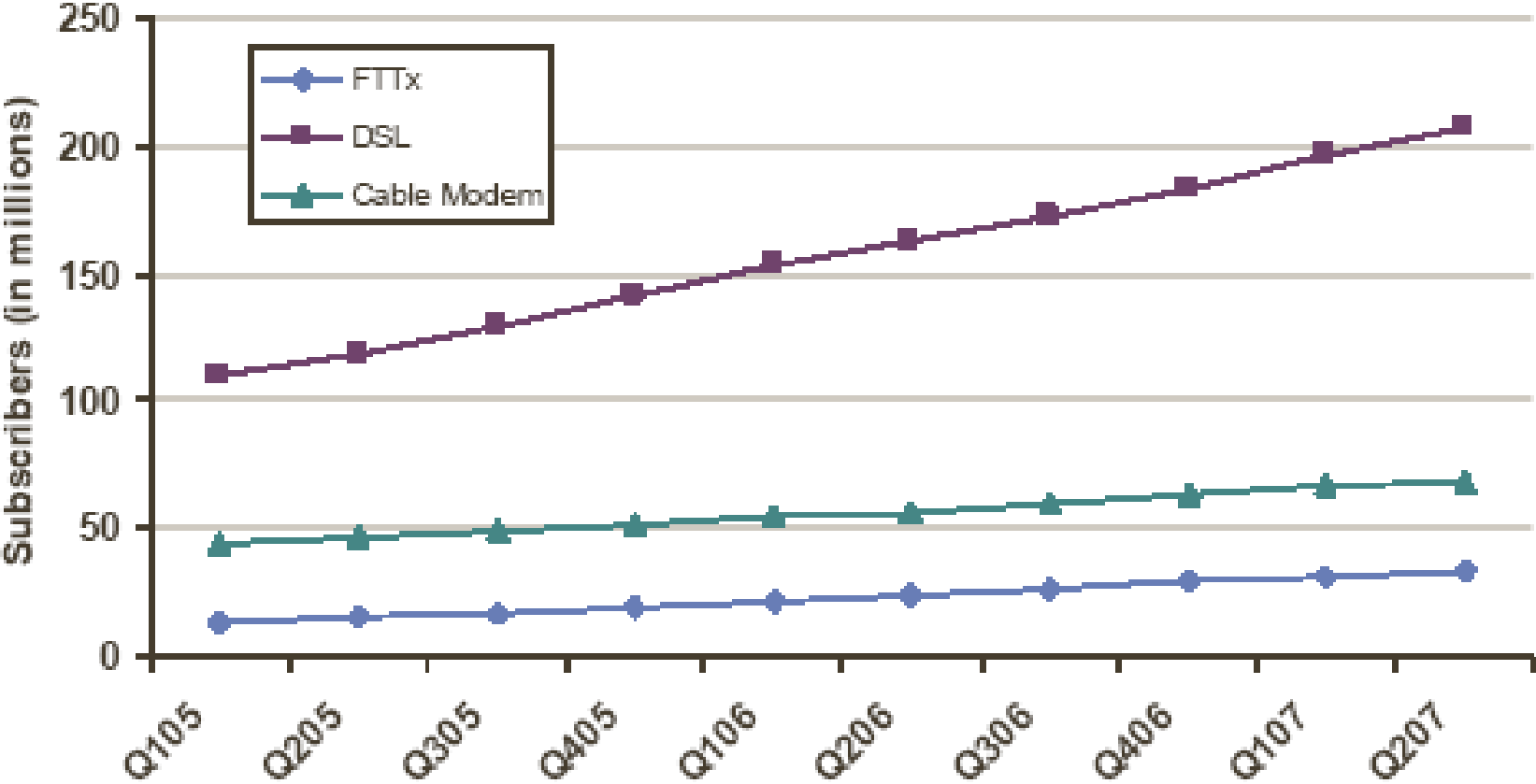
Figure 6: Total Broadband by Technology



Broadband subscribers

(Point Topic, Q207)

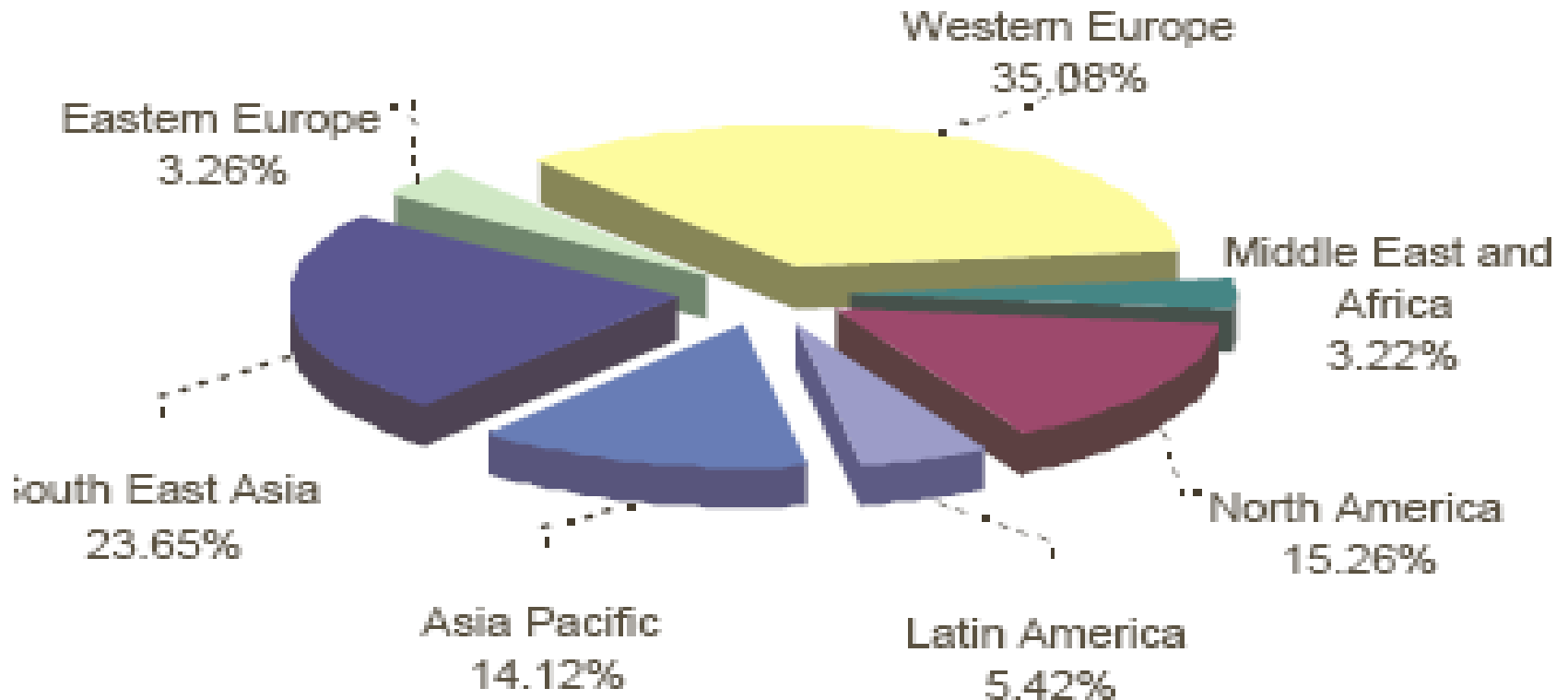
Figure 5: Technology Trends



Broadband subscribers

(Point Topic, Q207)

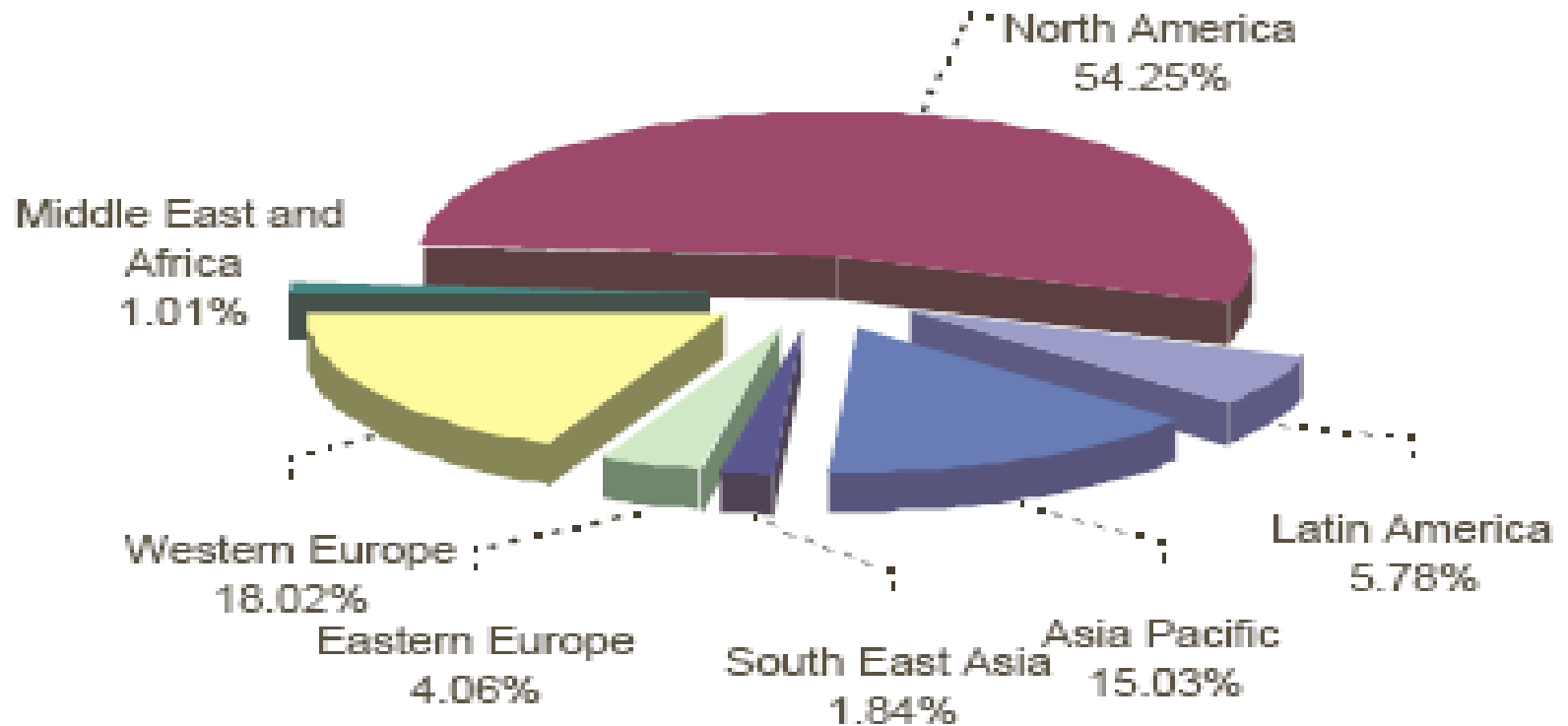
DSL Market Share by Regions



Broadband subscribers

(Point Topic, Q207)

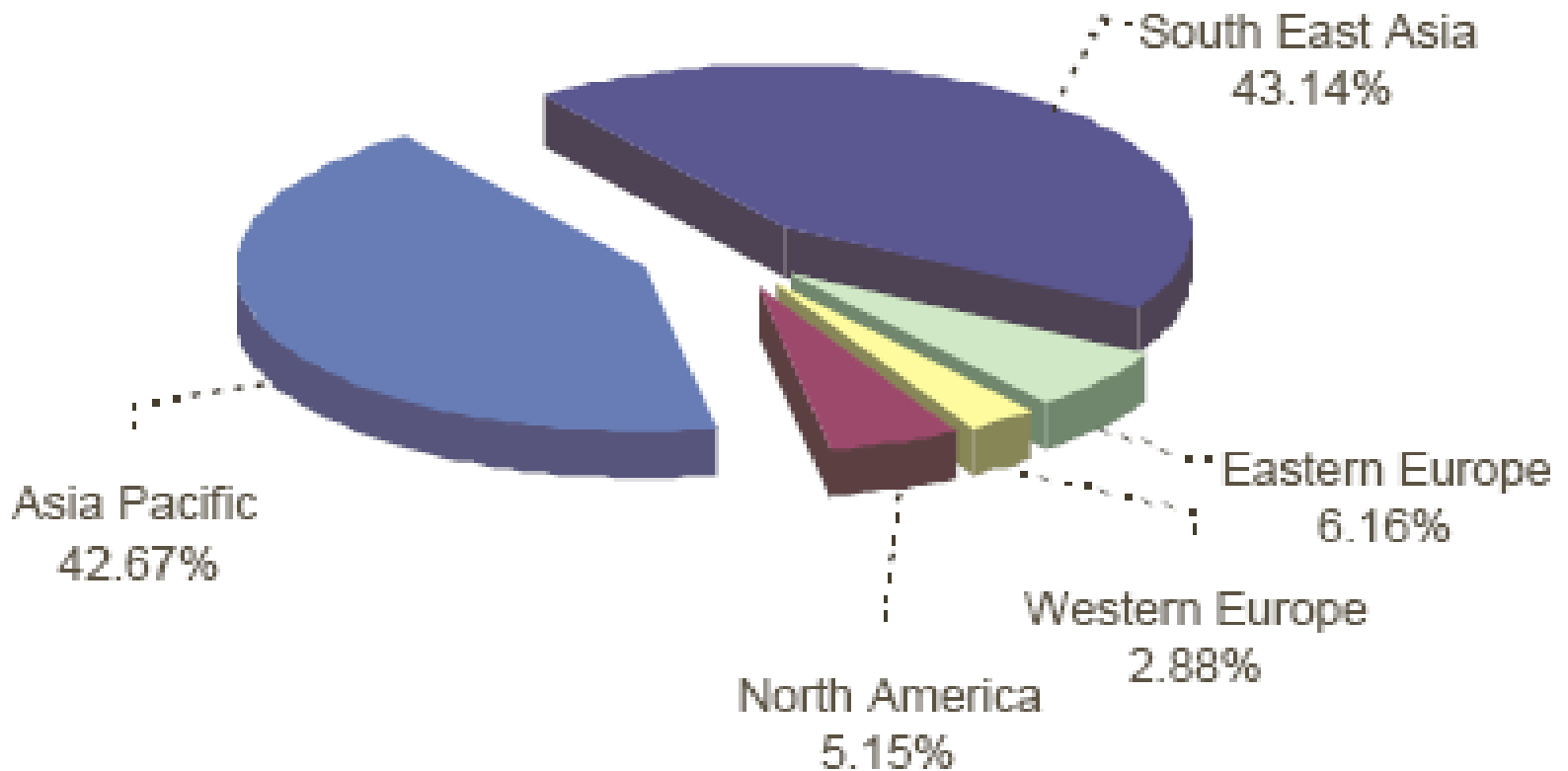
Cable Modem Market Share by Regions



Broadband subscribers

(Point Topic, Q207)

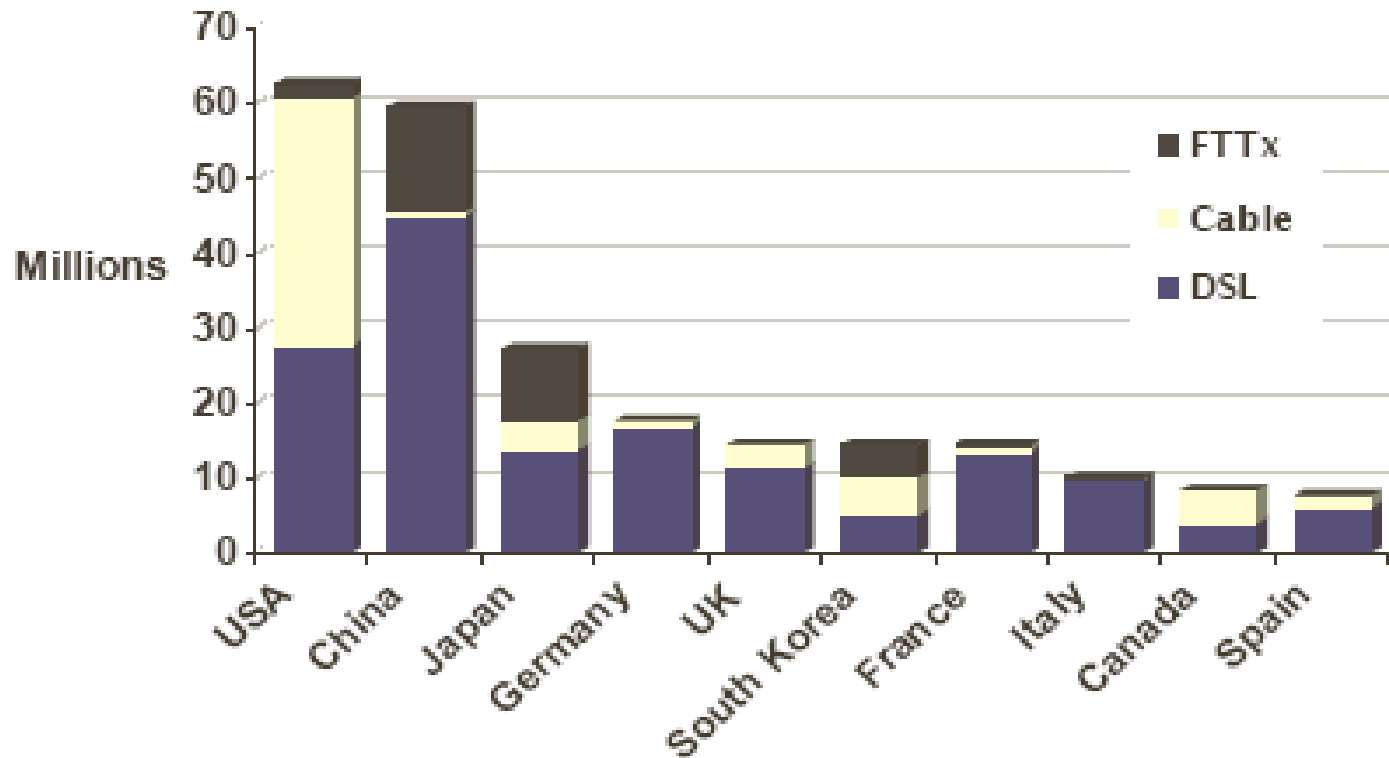
FTTx Market Share by Region



Broadband subscribers

(Point Topic, Q207)

Figure 12: Total Subscriber Numbers by Technology Adopted



Broadband APSEA

Point Topic, Q207

Country	Total	DSL	Non DSL
China	59.53	44.76	14.77
Japan	27.25	13.79	13.46
S Korea	14.44	4.88	9.57
Taiwan	4.57	3.85	0.79
Australia	4.24	3.46	0.72
India	2.53	2.14	0.39
Other	6.74	5.17	1.57
<i>Total</i>	119.30	78.03	41.27

Broadband Americas

Point Topic, Q207

Country	Total	DSL	Non DSL
USA	63.41	27.62	35.79
Canada	8.18	4.85	4.27
Brazil	6.68	3.90	1.83
Mexico	3.71	2.61	1.09
Argentina	1.80	1.27	0.53
Chile	1.13	0.65	0.48
Other	2.33	1.81	0.51
<i>Total</i>	87.23	42.71	44.52

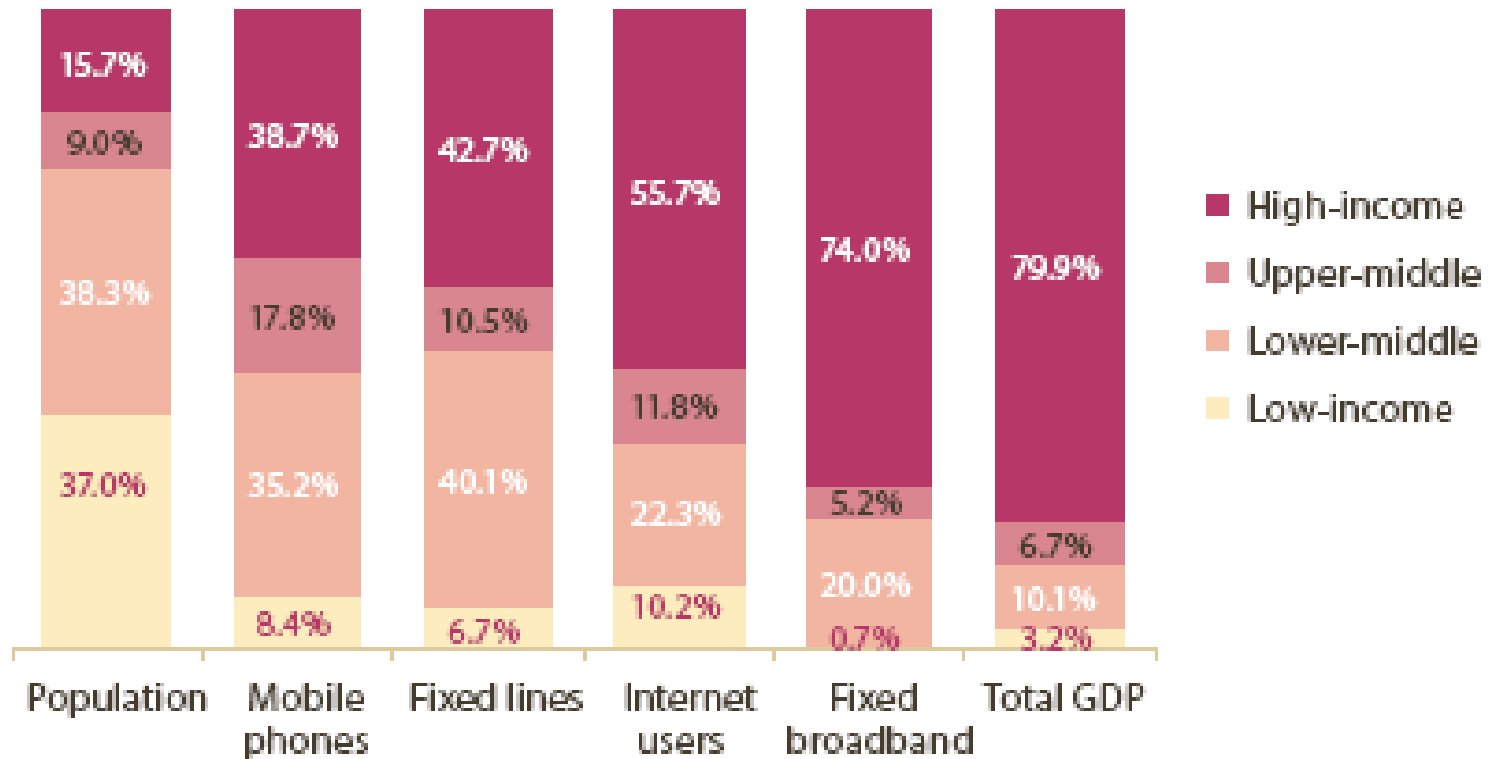
Broadband Tariff Trends (2007): Average residential downstream speeds

	Average DSL downstream speed Q3 (Kbps)	Percentage Change over last quarter
Western Europe	5,552	+6.22
South & East Asia	3,582	+132.15
Middle East & Africa	1,404	-0.71
North America & Canada	2,971	+0.17
Latin America	1,652	+29.06
Eastern Europe	2,443	+6.59
Asia Pacific	14,989	+38.79

World Information Society Report

ITU, UNCTAD, 2007

Figure 2.3 : Distribution of major ICTs by income group of economies

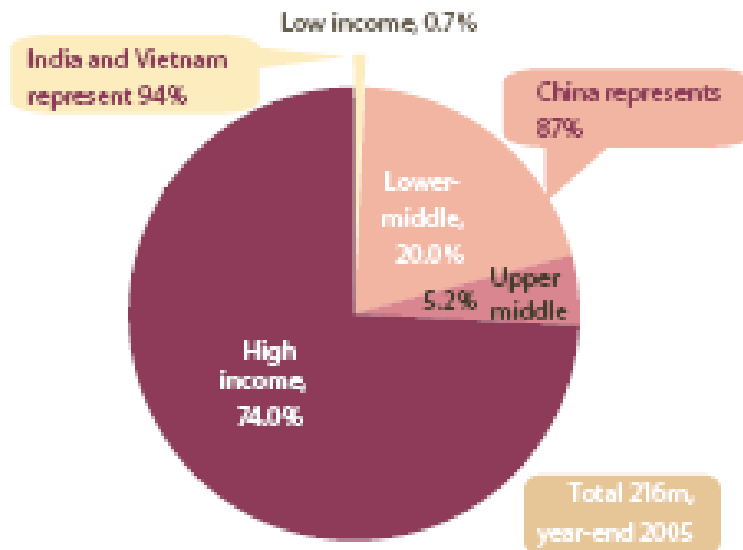


World Information Society Report

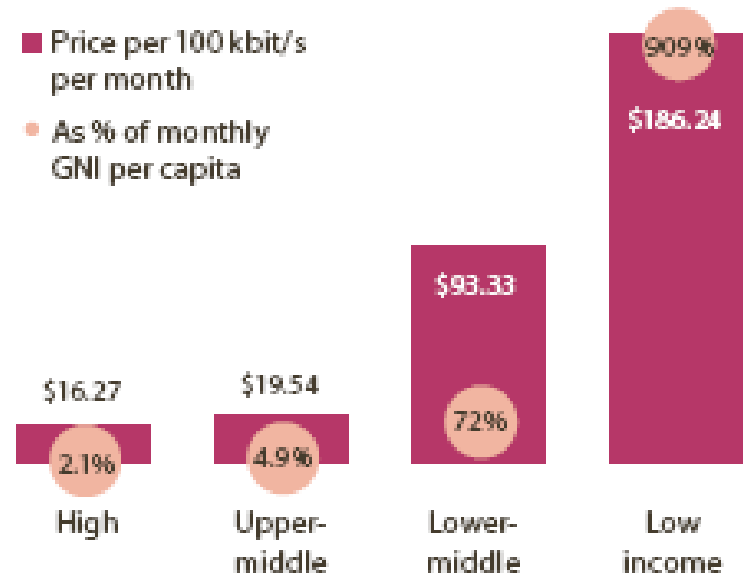
ITU, UNCTAD, 2007

Figure 2.6: Broadband Inequality ... and its cause

Distribution of fixed broadband subscribers, by income group, 2005



Broadband prices and affordability, by income group, 2006 (in USD per month)



Source: ITU World Telecommunication Indicators Database, UNCTAD and "ITU Internet Report 2006: digital.life"

World Information Society Report

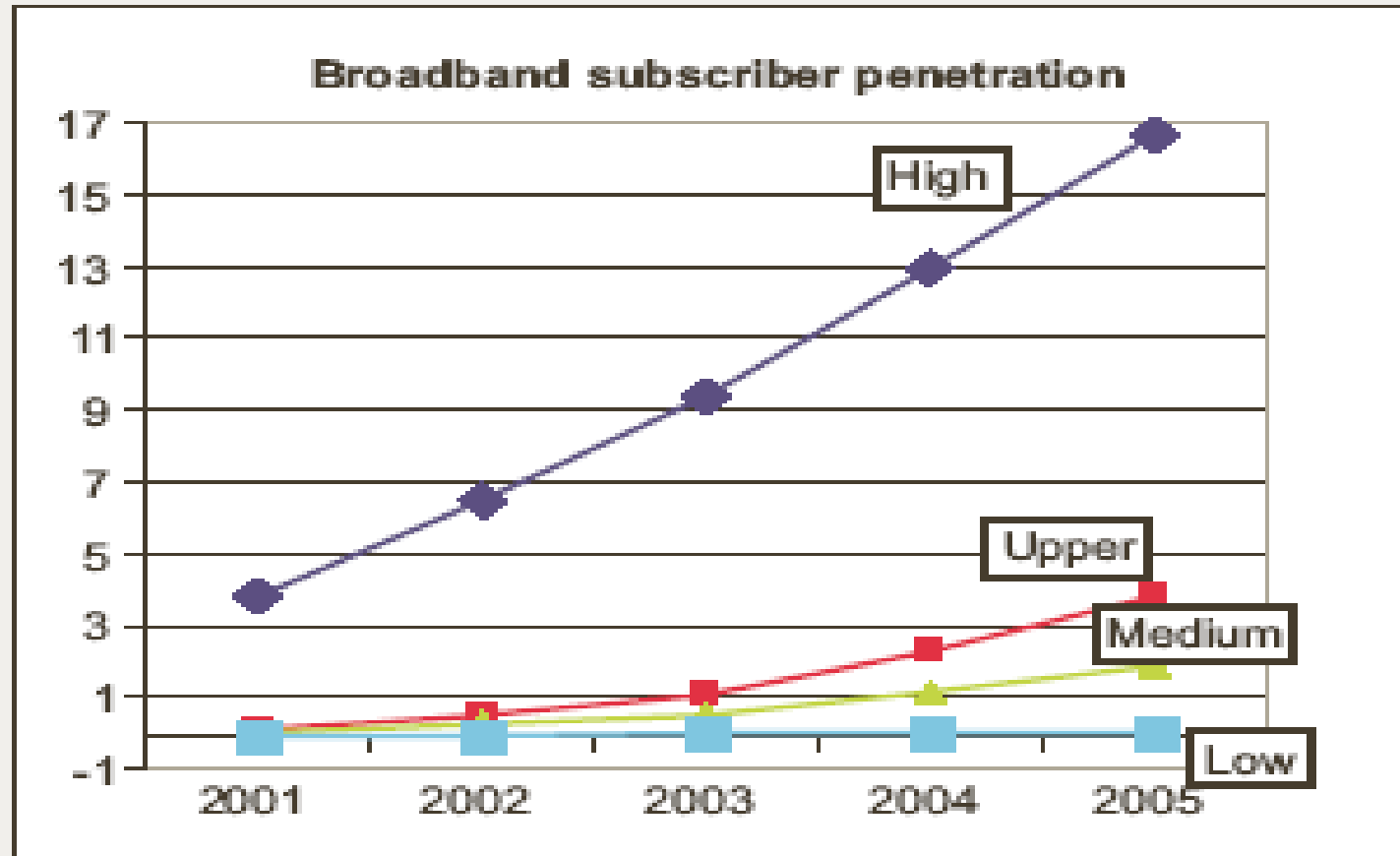
ITU, UNCTAD, 2007

Table 2.2: ICT affordability by income group of economies, 2006

Income group	Monthly basket of Internet use		Monthly basket of fixed broadband use		Broadband Prices (USD per 100 kbit/s)	
	USD	% monthly per capita income	USD	% monthly per capita income	USD per 100 kbit/s	% monthly per capita income
High	\$22	0.9	\$15	0.7	\$16	2.1
Upper-middle	\$22	4.9	\$12	2.6	\$19	4.9
Lower-middle	\$24	19.7	\$11	7.6	\$93	71.8
Low	\$44	172	\$13	54.9	\$186	909
World average	\$29	55.2	\$13	18.3	\$72	225.1

World Information Society Report

ITU, UNCTAD, 2007



Future broadband:

Policy approach to next generation access (Ofcom, September 2007)

- looking internationally, most, if not all, current deployments of next generation access are relying on variants of FTTC or FTTH.
- wireless networks have had a limited deployment for the provision of fixed communications services. The nature of wireless services may make the provision of the sustained high bandwidths that may define next generation access services difficult through wireless networks.

Ofcom

Figure 2: Incumbent next generation access deployment plans by target date



Target homes (m)	1	1	8	2	18	18	2	2	2	12	47	8
Investment	£190m	£120m	£2bn	£200m	£11bn	£3.2bn	£285m	£67m	N/A	N/A	£25bn	£670m
Technology	FTTH	FTTC	FTTC	FTTC	FTTH	FTTC	FTTC	FTTH	FTTC	FTTH	FTTH	FTTC
Target Year	2009	2009	2008	2006	2010	2008	2008	2008	2010	2010	2010	2009

Source: Various

Next Generation access drivers (Ofcom)

- **New Revenue opportunities:** current generation access network owners may view the deployment of next generation access as an option to generate additional revenues, particularly through the deployment of **IPTV services** where there is a relatively underdeveloped multi-channel or pay TV market;
- **Competition:** intense competition from **cable or LLU** has been an important driver in markets such as the US, Belgium and the Netherlands.
- **Cost of deployment:** cost of deployment may vary significantly between geographies. In France, the ability to access existing physical infrastructure, including Paris' sewers, has been important in encouraging fibre deployments. In other countries, such as Japan, telecoms networks have a high proportion of their infrastructure installed overhead, making it much less expensive to upgrade than buried networks;

Next Generation access drivers (Ofcom)

- **Cost base reduction:** deployment of next generation access enables network operators to reduce their cost base by enabling the sale of exchange buildings, as KPN intends in the Netherlands.
- **Operating cost reduction:** Next generation access may also lead to reduced operating costs. For example, experience from Verizon suggests that outside plant network problems have reduced by up to 80% for its FTTH FiOS service compared to its legacy voice and DSL services;

Next Generation access drivers (Ofcom)

- **Lower quality copper:** in some locations, poor copper quality or long local loops mean that exchange based DSL is subject to significant limitations on download and upload speeds. This has been a driver behind fibre deployments by US local loop incumbents, where DSL speeds were typically lower than those available in Europe; and
- **Public sector intervention:** this has played a key role in countries such as Japan and Korea, where fibre deployment has been outlined in national technology plans. In other countries, including Sweden and the Netherlands, local government has played a role in deploying municipally owned next generation access networks.

Ofcom

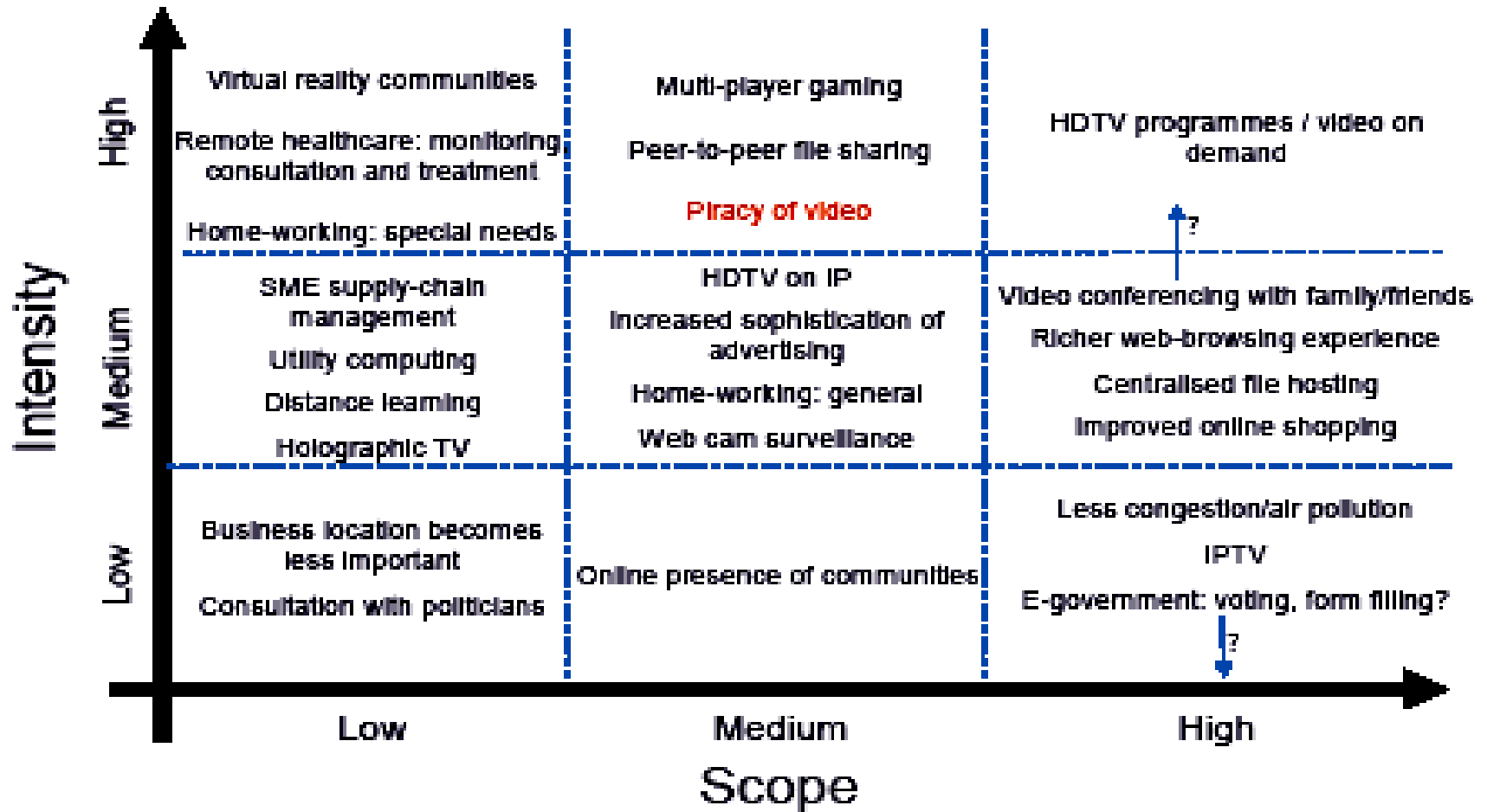
Figure 3: Key drivers behind next generation access deployment

	IPTV	Competition	Lower cost build	Cost savings	Lower quality copper	Public sector intervention
Belgium	✓	✓				
France	✓	✓	✓			
Germany	✓					
Japan			✓			✓
Netherlands		✓		✓		
South Korea			✓			✓
Sweden						✓
US	✓	✓		✓	✓	

Source: Ofcom

NGN Applications and Services

Ofcom



NGN Applications and Services Ofcom

- Assessment of a range of different applications and services in terms of
 - their relative scope: the number of people that may be affected by their availability,
 - their relative intensity: the incremental impact on consumers and businesses from their availability.
 - Both of these factors are assessed in comparison to the benefits that may be delivered by current generation broadband access networks.
- With the exception of applications benefiting the activity of SMEs, these are primarily entertainment services.
 - The incremental social, as opposed to private, value of these four applications compared to the applications and services available over current generation broadband access networks remains highly uncertain.

TRAI assessment

- the growth of Internet subscribers is satisfactory but we are seriously lagging behind on broadband front.
- The broadband subscriber growth initially (during 2005-06) was high (more than 600 %) but subsequently declined to an annual growth of just 60-70%. The high growth rate was largely due to very few broadband subscribers i.e. a narrow base.
- The targets fixed for the Broadband Policy are unlikely to be achieved. There are critical issues inhibiting broadband expansion in urban as well as rural areas. The urgency to provide impetus to the growth of Broadband is recognised at the highest level and the Government has declared Year 2007 as 'Year of Broadband'.

TRAI Recommendations On Issues pertaining to Next Generation Networks (NGN), 20th March 2006

- For facilitating the NGN migration in access network various provisions of broadband policy 2004 need to be followed up and reviewed expeditiously especially those pertaining to following:
 - a. Unbundling of local loop (item 3.1(b) of Broadband Policy 2004)
 - b. Delicensing of 5.1-5.3 GHz band for outdoor usage for Broadband access (item 3.1(e) of Broadband Policy 2004)
 - c. Identification of additional spectrum bands, which are not in high usage, for deployment of Broadband services in access (item 3.1(e) of Broadband Policy 2004)

Draft Recommendations on Growth of Broadband, 17th September , 2007

- Shortage of Customer Premises Equipments (CPEs) for Broadband
 - Government should encourage Indian manufacturers to produce more CPEs used to provide Broadband using DSL technology.
 - Standardisation of DSL CPEs used to provide broadband should be done by TEC immediately in time bound manner and information of all CPEs conforming to specifications should be displayed on TEC website for the information of customers.

Draft Recommendations on Growth of Broadband, 17th September , 2007

- Right of Way (RoW) problems
 - Very high RoW charges
 - Longer time for providing RoW
 - Clearance from several other agencies is required even if clearance of respective municipality is obtained.
 - Ban on open trenching in all the seasons even for fault repairing
- The Central Government may consider mandating the state governments to adopt uniform RoW procedures and streamline/ rationalise RoW cost, which may primarily be limited to cost of re-instatement only.
 - RoW costs should be non-discriminatory, reasonable.
 - RoW procedures should be transparent and publicly available.