

The slide features a blue background with a glowing fiber optic cable and a grid pattern. The Accenture logo is in the top left, and the Berlin ICF 2001 logo is in the bottom right. The Berlin ICF 2001 logo includes the word 'BERLIN' at the top, a silhouette of the Brandenburg Gate in the middle, and the letters 'ICF' and the year '2001' at the bottom.

accenture

Economics for Telcos

Hans de Boer

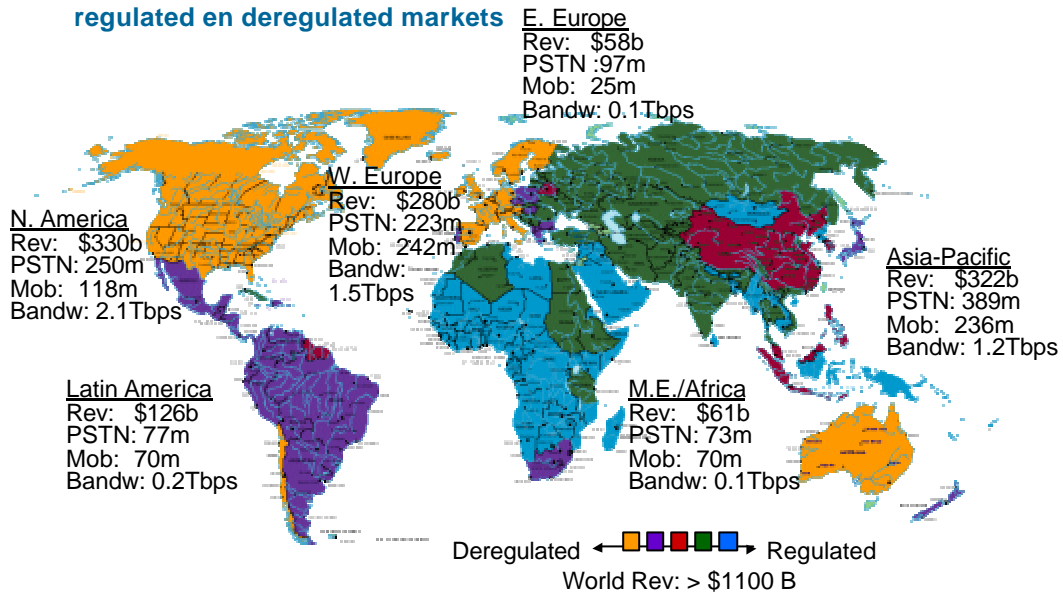
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Good Morning !

This presentation will try to sketch the World Wide Telecom Market, to explain the structure - with its typical regional differences - look at investments and market expectations and to indicate some reforms needed to sustain growth.

Expected deregulation

Considering telco economics, it is important to make a distinction between regulated en deregulated markets



Source: Gartner Dataquest, Ovum, Idate, IDC, Accenture analysis

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The world map shows that the three largest regions North America, Western Europe and Asia Pacific are approximately equal in revenue size, around 300 B USD.

The amount of wire lines PSTN clearly is by far the largest in Asia Pacific and that will remain, because that it is also the region with high growth, mainly in China and India. These markets are regulated and therefore rather stable in its planning.

Mobile has higher penetration in W. Europe and Asia Pacific when compared to US. Also for mobile growth will be mainly in Asia Pacific.

For bandwidth, the picture is different. Most bandwidth is installed and used in North America where the amount of applications and the use of Internet is most advanced there. It may be expected that the other regions will follow such bandwidth development.

The colors on the map try to express the balance between regulation and deregulation. Country are rated for the freedom of the incumbent operator, to what extent is network open for competition, what barriers exist for new entrants, how is number portability, how are rules for inter-connection. Is the network un-bundled, like in Sweden as explained by Ove Alm.

What's happening?

An overview is presented how the telco industry will evolve world-wide, focusing on trends in both the industry structure and industry demand



- Regulated markets are moving towards partial deregulation
- Deregulated markets have turned their attention over the last 18 months to cost containment and debt reduction
- To illustrate the underlying economics, the focus will be on:
 - Industry structure
 - Industry demand



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In comparison, the regulated markets - where government willingness to invest in telco services and to open the market is dominant - enjoy most of the stable growth for traditional PSTN in the coming years. Many are fairly well predictable because of government controlled budgets.

In contrast, the de-regulated markets are very different. Penetration is much higher already and the attention is focused on new services, competition, market dynamics etc.

Regulated markets



Regulated markets, where government willingness to invest in telco services and to open the market is dominant, are developing in different pace

Asia-Pacific (excluding Japan and Australia)

- Strong governmental position in assigning orders
- Steady and planned growth
- When new telcos are formed, Asian participation mandatory controlled by government

Eastern and Central Europe

- Joining the European Union accelerates deregulation.
- However, no affection for biggest part, Russia
- Overall uncertain developments and low spending

Africa (excluding South Africa)

- Lack of demand because income per capita is very low
- Population spread across entire
- Very large, continent requiring huge investments if standard technologies are used

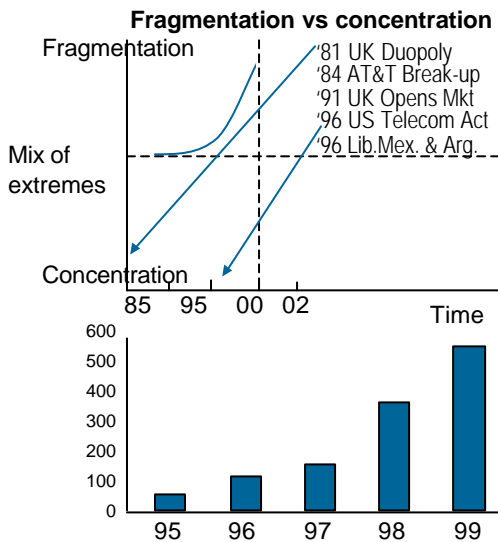
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More in details the basic differences for various regulated regions.

Hypergrowth



Deregulation, easy access to capital, and high expectations for consumer spending drove the hypergrowth in Western Europe and America



Players "New entrants"

- Begin "circle of greed" early '80s, peak european telco boom early '00
- Since '96, carriers increased by 70-80%, while incumbents set up alliances

Financial position "Capital markets get excited"

- Market valuation wireless operators enormously
- Credit ratings strong
- Capex grew significantly

Consumers "High expectations"

- High expectations about consumer spending
- Macro-economics situation encouraging

International Carriers

To understand the industry structure of the de-regulated markets, it is useful to look back in time. What happened and why did it happen?

In the first place it was the break-up of the AT&T strong monopoly in US. This trend was followed some time later in Europe and again later in Latin America. This resulted in an enormous increase in the number of players. From '96 until today, so in 5 years time the number of international carriers has doubled. Similar for mobile: some countries enjoy 5 operators. Also incumbent companies have participated in this game, setting up new companies and alliances.

The financial position of most of the newcomers was fairly strong until recently: good credit ratings, reasonable (growing) debts, shares values booming to 450%.

Consumers were very optimistic and spending level was high for all new gadgets and services.

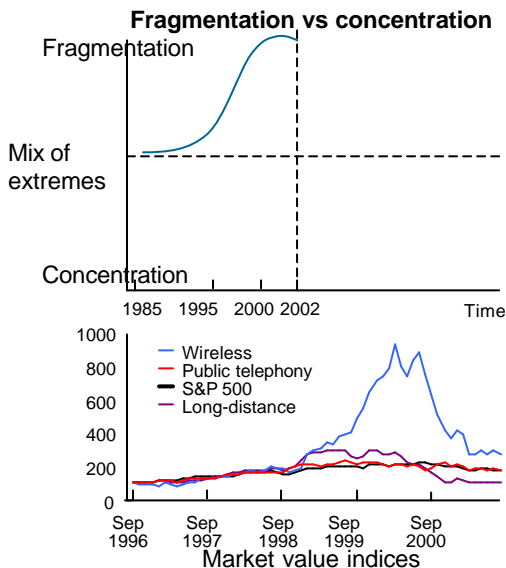
Due to this optimism, many companies increased investments, almost doubling capex/sales in the period 1996 - 2000.

A general observation is that also other markets got overheated. A reason could be the amount of information increasingly available gives a better understanding of markets and it may make people change their opinion much more rapid than before. The events in the Telecom market are a good example of this effect: Be first, the winner takes it all. When the tide turned, investments were dropped.

Facing hardships



The financial situation got less prosperous, due to weak offerings, low take up of new services and intense competition, combined with high investments



Players "Overcapacity puts pressure on prices"

- Overcapacity and intense competition, prices fall
- IPO's are delayed
- First requests for bankruptcy
- **Financial position** "Less prosperous"
- Dot.com shake-out
- Market valuation declines
- High capital expenditure
- Weaker debt ratio increases finance cost
- UMTS-license auctions forcing telcos to be critical on spending
- **Consumers** "Spending less than expected"
- Service offering and service take up disappointing
- Economy declines

Source: Standard and Poor's, 2001

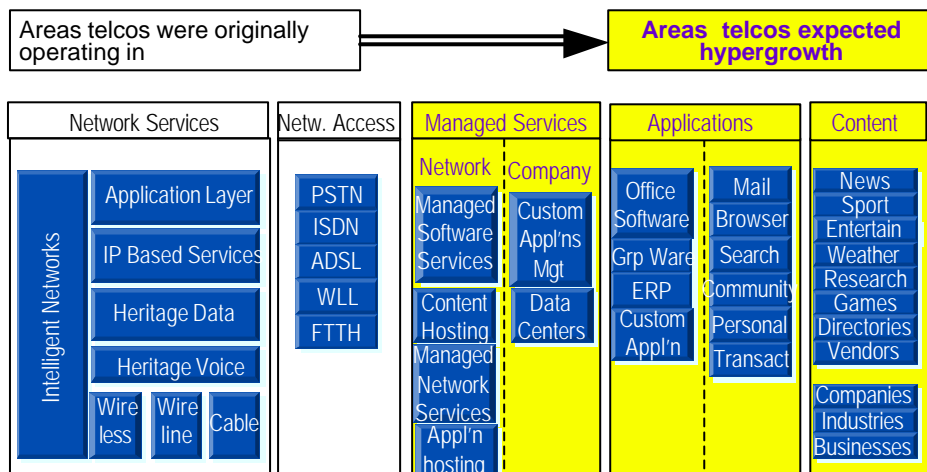
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This race has caused a great lot of long haul bandwidth, not always in the right location. The projections made by each player were not very much wrong. However when all projected market shares are added, some over capacity pops up. Under the circumstances prices fall, returns do not realize and far too high UMTS licenses had to be paid. Moreover, experienced players like Vodafone had their financial structure in place to act quickly, pick up acquisitions, convert loans into shares, etc. Others were still were setting up or restructuring and missed the speed to react to the first negative signals. All that increased vulnerability. Debt plays an important role: for some players, debt to sales was 40% at end '98, increasing to increased to 50% in March 2000. Mainly traditional players face this problem, because of their inherited financial structure.

However, not all is negative. Still growth continues, at some segments still double digits for mobile, especially in Asia. Wireline for voice and dial-up services, like in Sweden as just explained by Ove Alm is typical a high growth area because of internet.

Transition

The industry was not able to make the transition from voice and network based services to application and content based services fast



Source: Accenture, telco's of the future, 2001

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It was a relatively simple integrated industry: own a network, offer voice channels, organize billing and customer relations, fixed line or mobile made not much difference. High growth could be supported: it was just more of the same network based services. On the slide this is expressed in the white background columns left.

That is no longer true. New fields as given in the yellow columns need to be considered to realize growth. Each column has its own business logic. Many of the components, identified as blue buttons, are not yet stable and reliable or even not yet available. Also, not yet is solved who will enjoy the revenue, the network operator or the content provider, each feels entitled to take the major part.

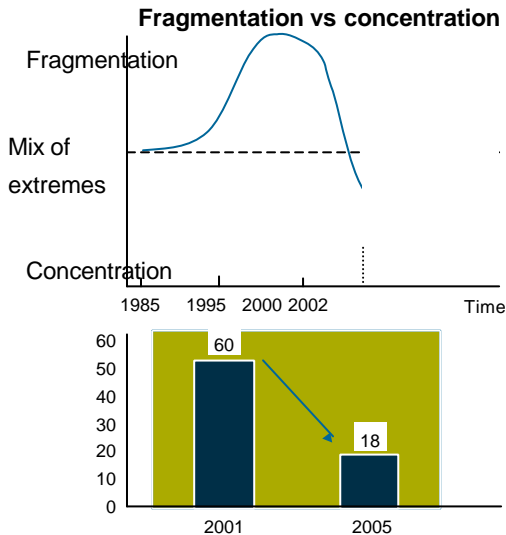
Now network operators must maximize traffic, the only thing at present they can do is stimulate more intensive use. However they can neither control any more the content that may provide such traffic nor choices to be made by end users. In this dilemma, they must decide to develop the yellow area and moreover, to do that right scale is required. And time. And money.

This is very similar to the development of e-business. World scale top 100 companies face a total restructuring of their business from procurement to customer services including re-education of their employees. This takes time and it can only be done in phases, step by step, layer by layer.

Decline



Concentration will occur to better utilize networks and to create necessary scale for cost-effectively developing content and application based services



Respondents expect:
Only 18 of today's top 60 telcos to exist in 4 years

Players "Concentration"

- Strive for new services to fill excess capacity
- Get a grip on total capacity offered by consolidating
- Assets sharing
- Experimenting to find right partners to develop services

Financial position "Restructuring necessary"

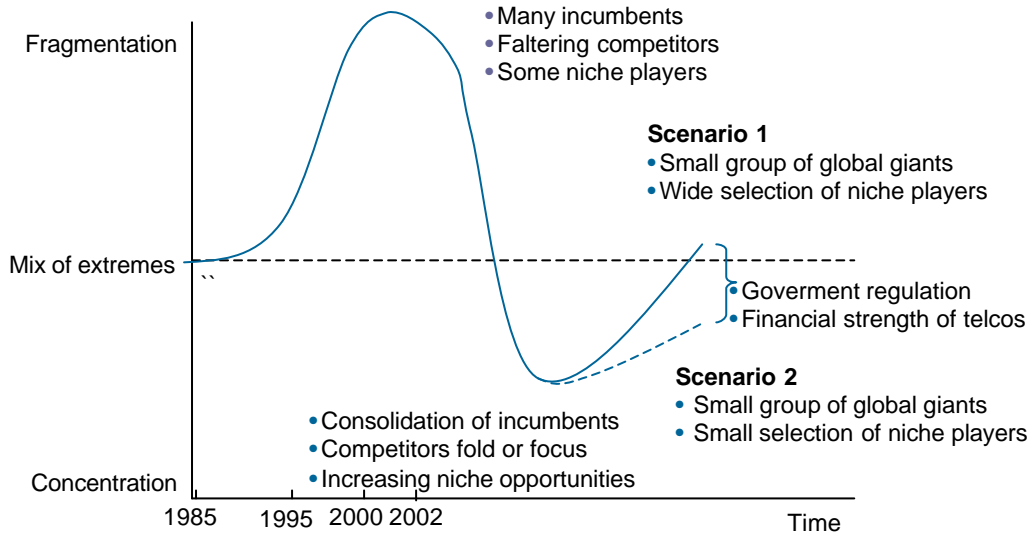
- Capex down
- Efficiency focus

Consumers "Slowly take up services"

- Economic outlook uncertain
- Barriers to take up value added services are still present

Now, what is going to happen? As said, the network operators will have to squeeze more revenue out of the actual systems. Technologies to do so are available. Industry concentration will have to take place to obtain scale and minor players will be swallowed or will disappear.

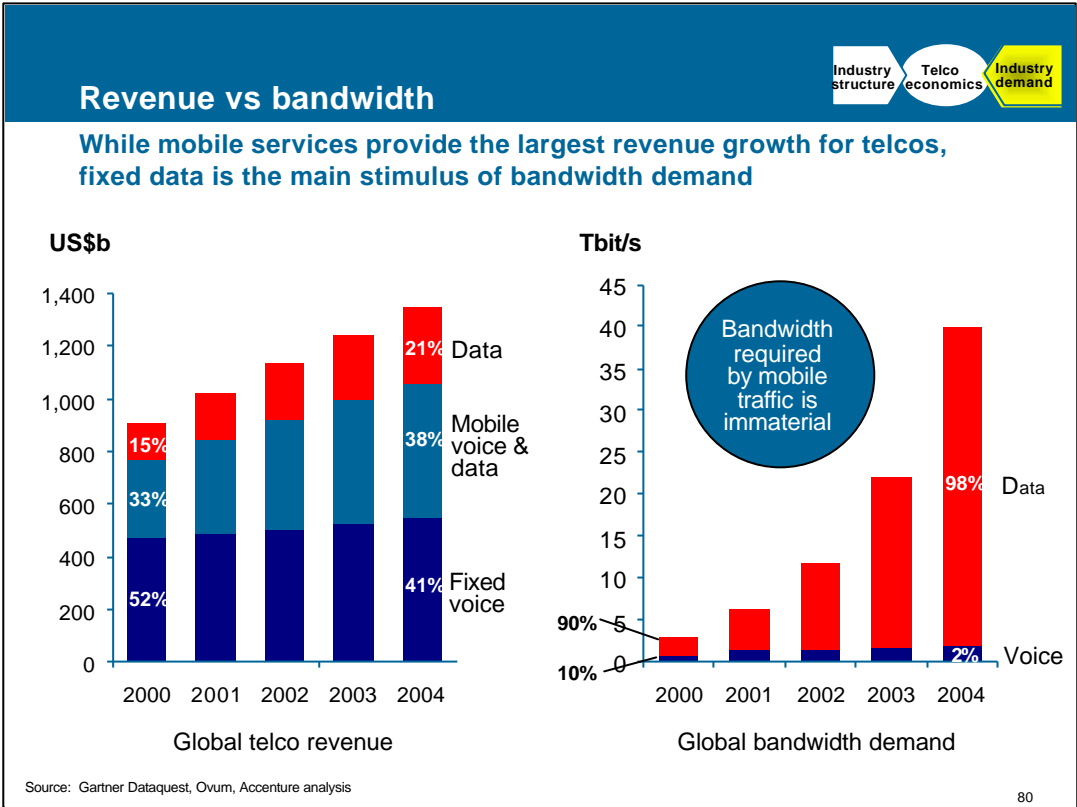
Financial strength of the consolidated giants and government regulation will determine the possibilities for niche players in the future



The same is true for networks, co-operation between operators and joint ventures for new construction and operation of networks is a financial necessity, because 4 or 5 UMTS networks in one country does not make sense. Capacities will be traded and exchanged to bring down costs.

Unbundling the network and operating it as a separate business is another option, like now done in Sweden. It will allow the mother company to concentrate on the new areas and it can generate substantial financial advantages.

Whatever the path, it will lead to much less players of much larger size. Additionally we will see a number of small specialists for certain user segments and services.



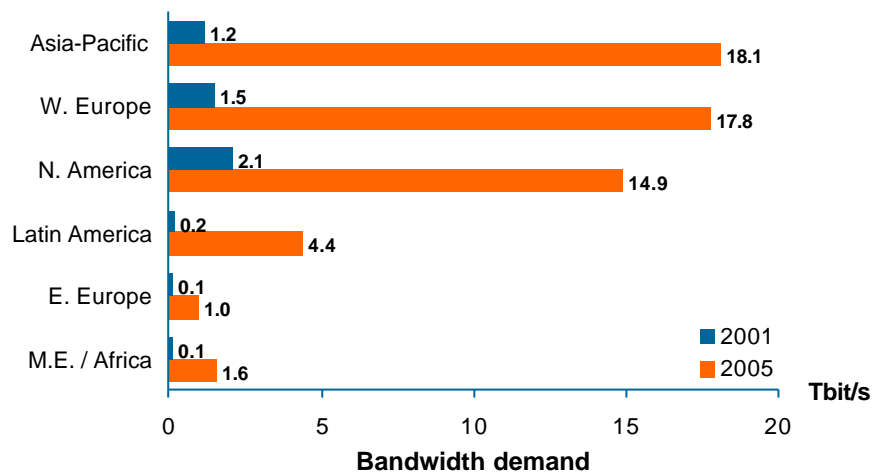
Now let us turn to Industry Demand.

Fixed voice will grow, but slowly. Mobile will grow faster and data will after some time bring some increases in revenue as well. Be aware, this is revenue.

A total different picture is the demand for bandwidth. Bandwidth as demonstrated at the right, does not bring proportional revenue at all. The growth of bandwidth is almost unlimited.

Bandwidth growth

Bandwidth growth is explosive across the globe



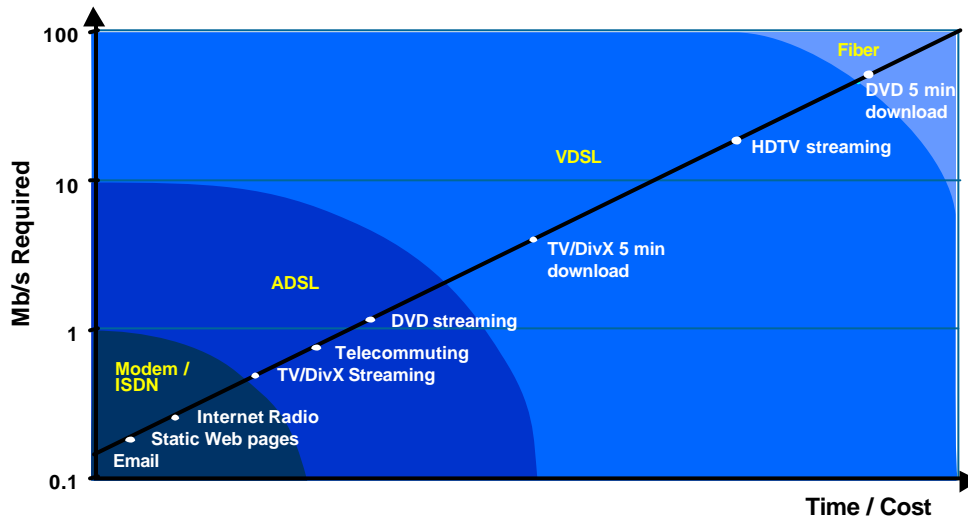
Source: Ovum, Gartner, Accenture analysis

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This is bandwidth growth by region. Exact figures are difficult to find, but clearly growth is large. Differences between regions will most likely disappear.

Residential applications of bandwidth

ADSL, and later VDSL, will allow copper to be a viable residential broadband access medium for the coming years



Source: Nortel, Accenture analysis

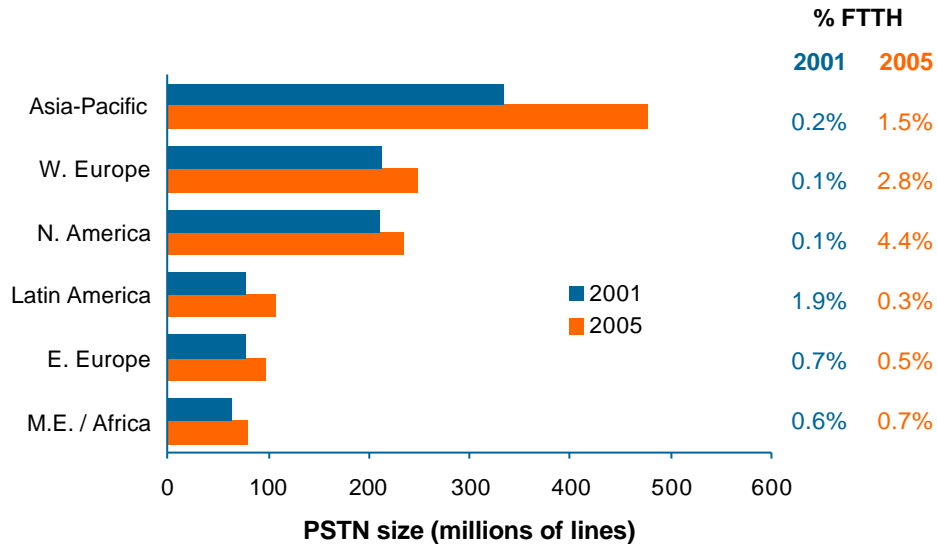
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How do technologies enable certain residential services?

Well, ADSL will be available for most households soon. Fiber will NOT be needed for the next 3 to 5 years from a technical point of view. Streaming DVD by ADSL is a sound proposition.

FTTH

Due to upgrading of copper-based bandwidth, in 2005 only 2.1% of connections will be via fiber, with largest growth in deregulated markets



Source: Ovum, Gartner Dataquest, Accenture analysis

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Still options may develop in FTTH.

- If unbundling proceeds to the extent that the split between incumbent operator and network is complete, the first may have economic reason to go for fiber, e.g. as competitive tool.
- FTTH could be developed as part of home or apartment ownership, the value of the property may increase. A way to do this is by tech-regulation, a feasibility in most countries .

Main conclusion remains: Growth in residential fiber will be minor. Asia is offers the best prospects because of backlog in network build up.

Industry structure
Telco economics
Industry demand

Investment expectations - deregulated

Investments in the deregulated markets will be directed towards network optimization

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graph TD
    Gov[Government:  
FTTH/B could be stimulated,  
however, price still a problem  
for customers] --> Center((Networks  
Optimization  
vs.  
Network  
expansion))
    NewEntrants[New Entrants:  
Environment unfriendly  
for new entrants] --> Center
    BandwidthDemand[Bandwidth Demand:  
Demand is strong, due  
to explosive growth in  
data traffic] --> Center
    BandwidthSubstitutes[Bandwidth substitutes  
Light un-lit fiber  
DWDM  
Capacity swapping  
Bandwidth trading] --> Center
    BandwidthSupply[Bandwidth Supply:  
Overcapacity in backbone  
Upgrading of local loop  
Major FTTH penetration not  
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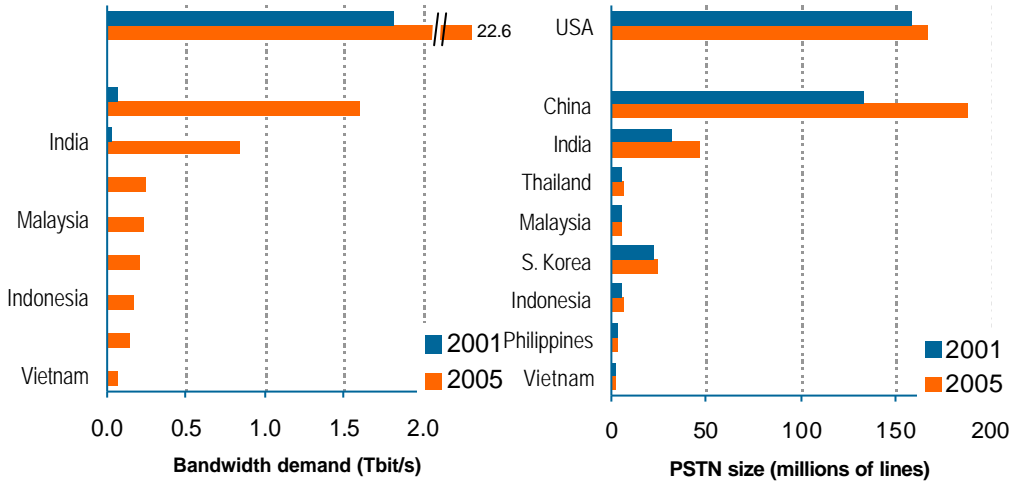
Source: Ovum, Accenture analysis 84

This slide summarizes the earlier statements. From almost all viewpoints, investments will be directed at network optimization and less about expansion.

Investment expectations - regulated



Major growth in bandwidth demand and PSTN size in developing Asian countries are likely to stimulate investments, especially in China and India



Source: Ovum, Gartner Dataquest, Accenture analysis

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Obviously, growth will be in Asia. Network roll out driven by economic growth, large scale housing and urbanization.

Conclusion



Regulated

Regulated Asian markets show stable growth, due to centrally planned investments in network expansion

Deregulated

- Telcos will consolidate to optimize utilization of their networks
- Customers' behavior is changing:
 - **Consumers** demand mature services they can afford. This requires extensive cooperation between the telcos and content providers
 - **Businesses** are increasingly rationalizing their investment in telco products and services. To realize this, telcos must find a balanced partnership with application providers



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Regulated markets will show continuity because the systems will have to grow in line with the developing economies.

De-regulated markets will see major changes. Operator will have to restructure their financial positions, some will have to break up and in the same time many smaller operators will be consolidated.

Customer behavior is changing here as well:

Consumers are less eager for novelties and will wait for simple and reliable solutions. The industry, all players involved, will have to bring that together. For the business segment, system integration will be more important than application development.

For wire and cable this is a mixed bag. Fiber will most likely not see an growth spurt and for conventional cable the word is: upgrading existing networks for ADSL.

Thank you for your attention.