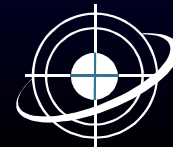


# Telecommunications Challenges and Opportunities In Africa

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Washington DC  
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**AdGen**

Advanced Generation Telecom  
Group Inc.

# Outline of Today's Presentation

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- Basic Facts
- Identifying Opportunities
- Forecast
- Immediate Issues
- Telecom Landscape in Africa
  - Wireline Developments
  - Mobile Developments
    - Mobile Technologies
  - ISP Developments
  - PLC Developments
- Challenges Facing Telecom Incumbents



***New technologies are revolutionizing the global communications industry. The booming Internet phenomenon, new cellular and satellite networks as well as rapid convergence in telecommunications and broadcasting is creating enormous opportunities and challenges for Africa.***



# Basic Facts

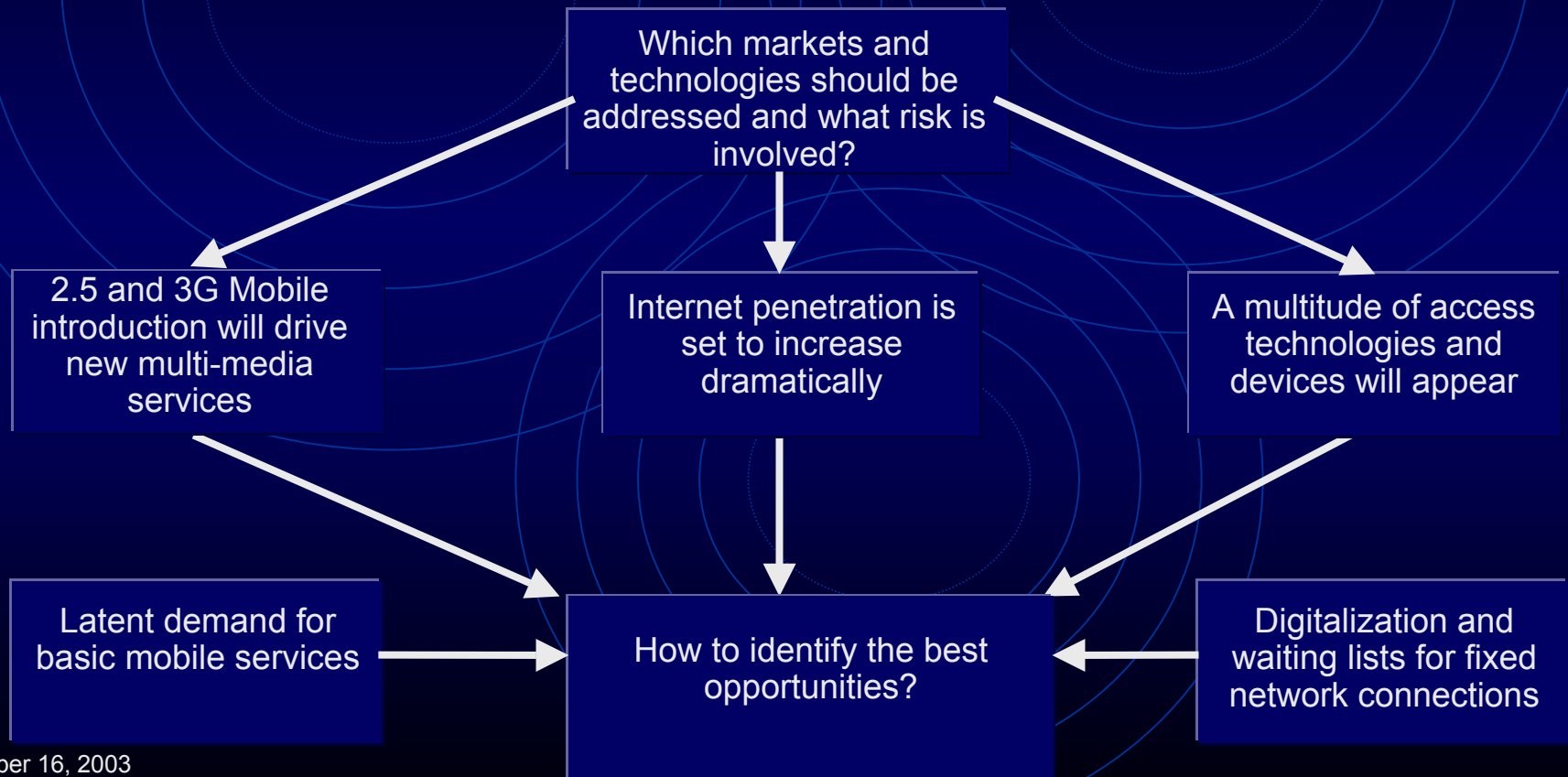
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- International Telecommunications Union (ITU) figures show that by the end of the year 2000, there will be only two telephone lines per 100 people in Africa, compared to four lines per 10 people in Europe.
- The average distance between phones in rural Africa is currently about 50 kilometers.
- While penetration rates exceed 60% in Western Europe, that type of growth has yet to be experienced in Africa.



# How to identify the best opportunities?

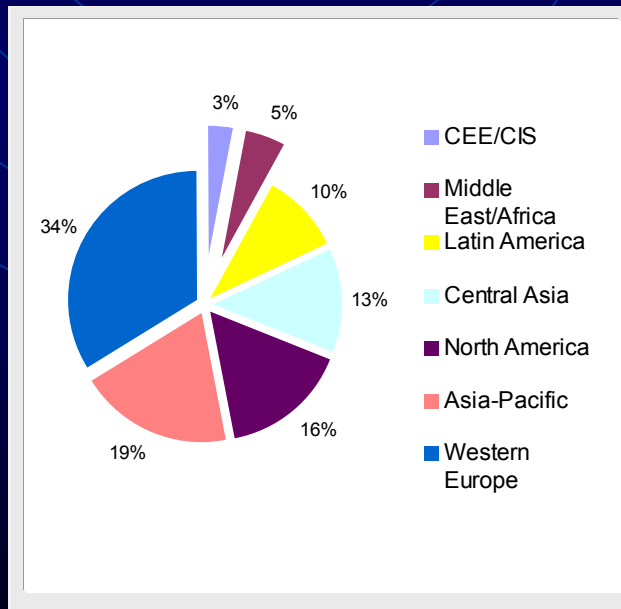
Identifying the requirements in Africa will require a clear understanding of all the key market and technology drivers.



# Forecast

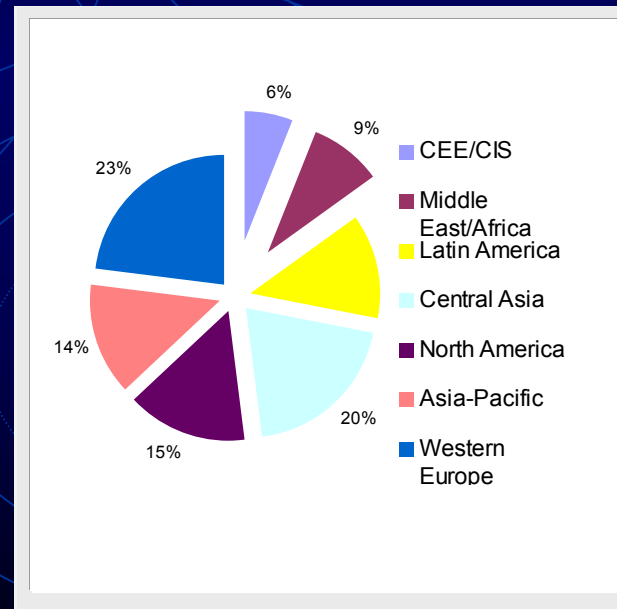
How to meet the forecasted growth in the telecommunications area. The number of mobile users will increase from roughly 1.1b today to about 1.8b in 2005, with highest growth rates in Africa and Eastern Europe

Distribution of mobile connections - 2001



Source: Ovum 2001

Distribution of mobile connections - 2005



Source: Ovum 2001

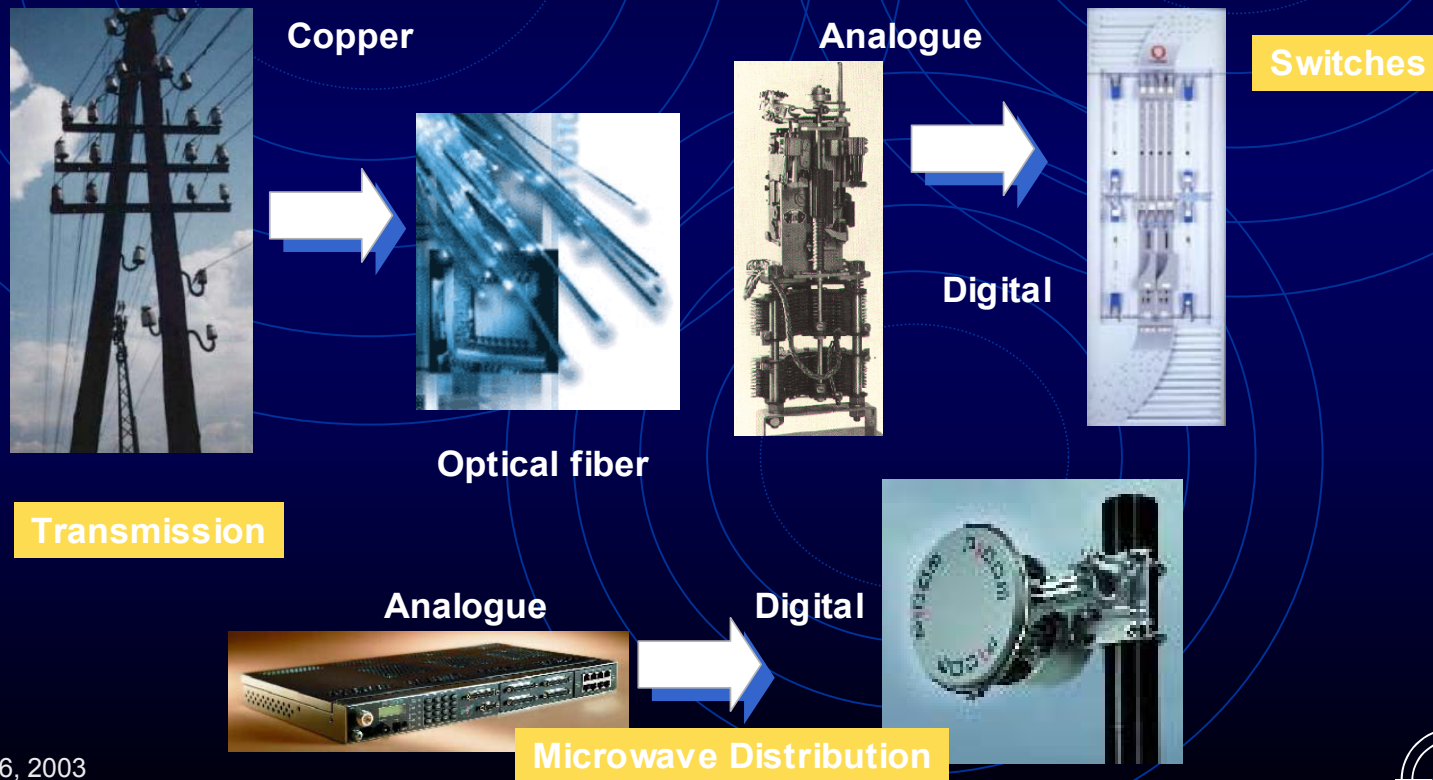


# Wireless Penetration Rates in Africa As of January 2003



# Immediate Issues

In many of the developing countries the fixed infrastructure is often based on antiquated analogue systems which need to be replaced by digital equipment



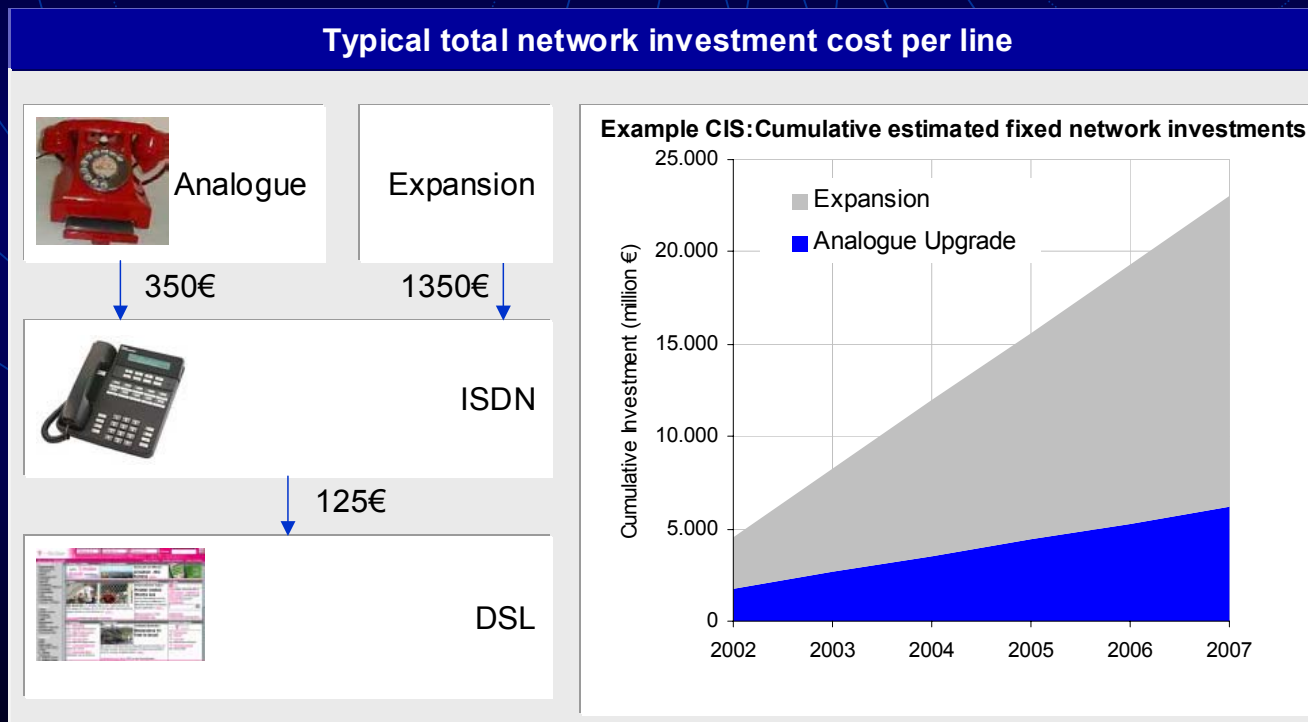


# Telecommunications Landscapes in Africa

	Fixed	Mobile	ISP	PLC
Incumbent	<ul style="list-style-type: none"> <li>• Face digitalization hurdle</li> <li>• Expansion often too expensive, or cannot be funded</li> <li>• Waiting lists</li> </ul>	<ul style="list-style-type: none"> <li>• Slow early leaders</li> <li>• Not quick to innovate unless Int.. partner dominates management</li> </ul>	<ul style="list-style-type: none"> <li>• Driver for Fixed network investments.</li> </ul>	<ul style="list-style-type: none"> <li>• May be of interest when teaming with state owned power co.</li> <li>• No progress until Regulation and Technology proven in US &amp; EU</li> </ul>
New Entrant	<ul style="list-style-type: none"> <li>• Few new players</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Most new entrants here</b></li> <li>• Often substitute incumbent's fixed network business</li> </ul>	<ul style="list-style-type: none"> <li>• Tend to be small, and suffer from poor dial-up quality of fixed network</li> <li>• Little to no Broadband (DSL) offerings possible</li> </ul>	<ul style="list-style-type: none"> <li>• Requirement to team with state owned power co. likely to be major hurdle</li> <li>• No progress until Regulation and Technology proven in US &amp; EU</li> </ul>

# Wireline Developments

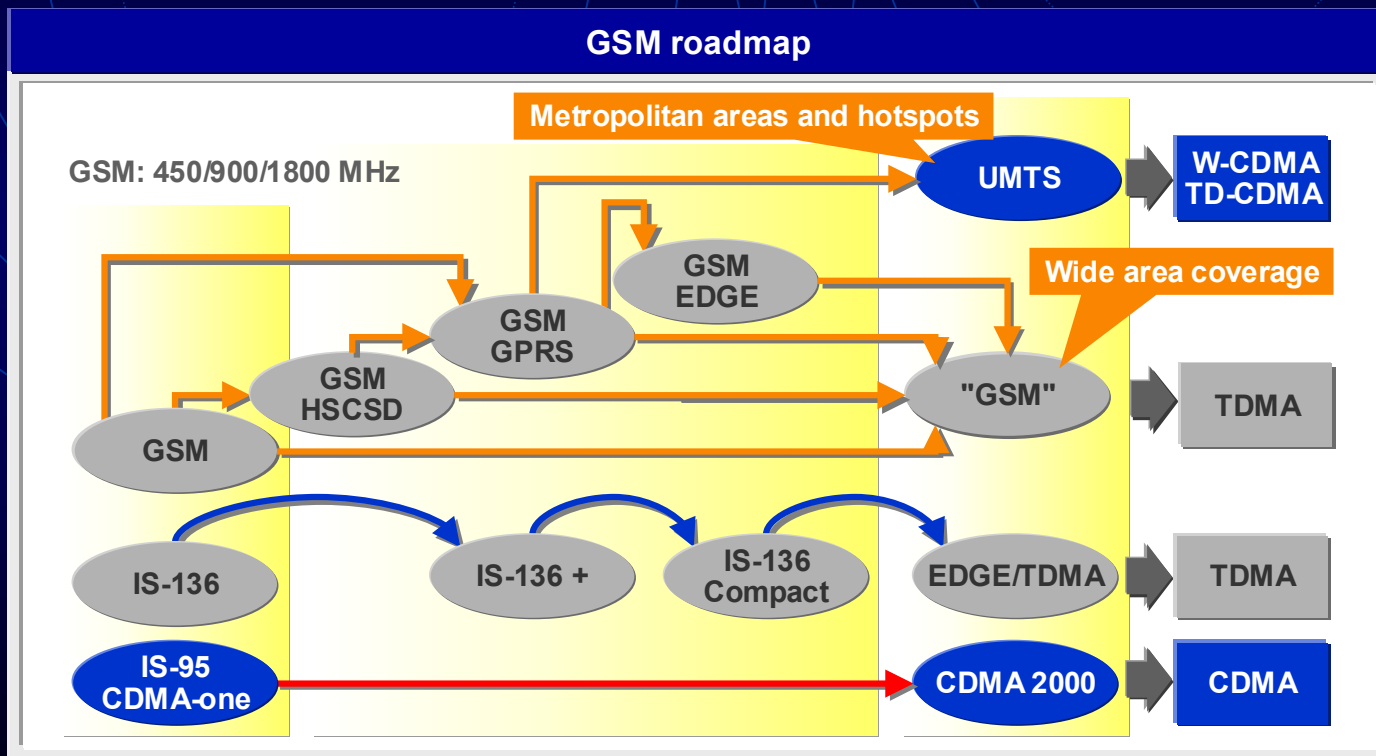
The roadmap for Wireline operators is clear, but requires significant financial resources for limited additional growth in subscribers and revenues



Source: ITU, Bridge analysis

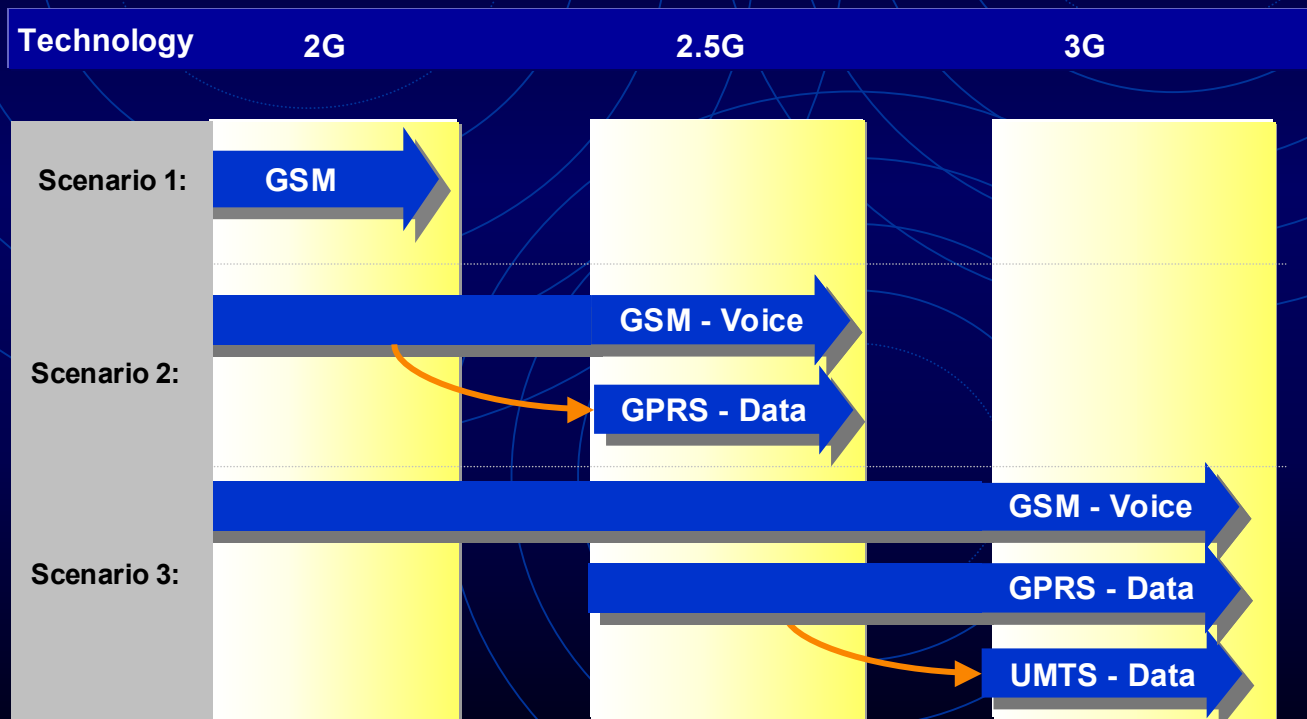
# Mobile Developments

Mobile developments within Africa tend to adopt the Western European standards (GSM, GPRS and UMTS) with typically 3-5 years delay.



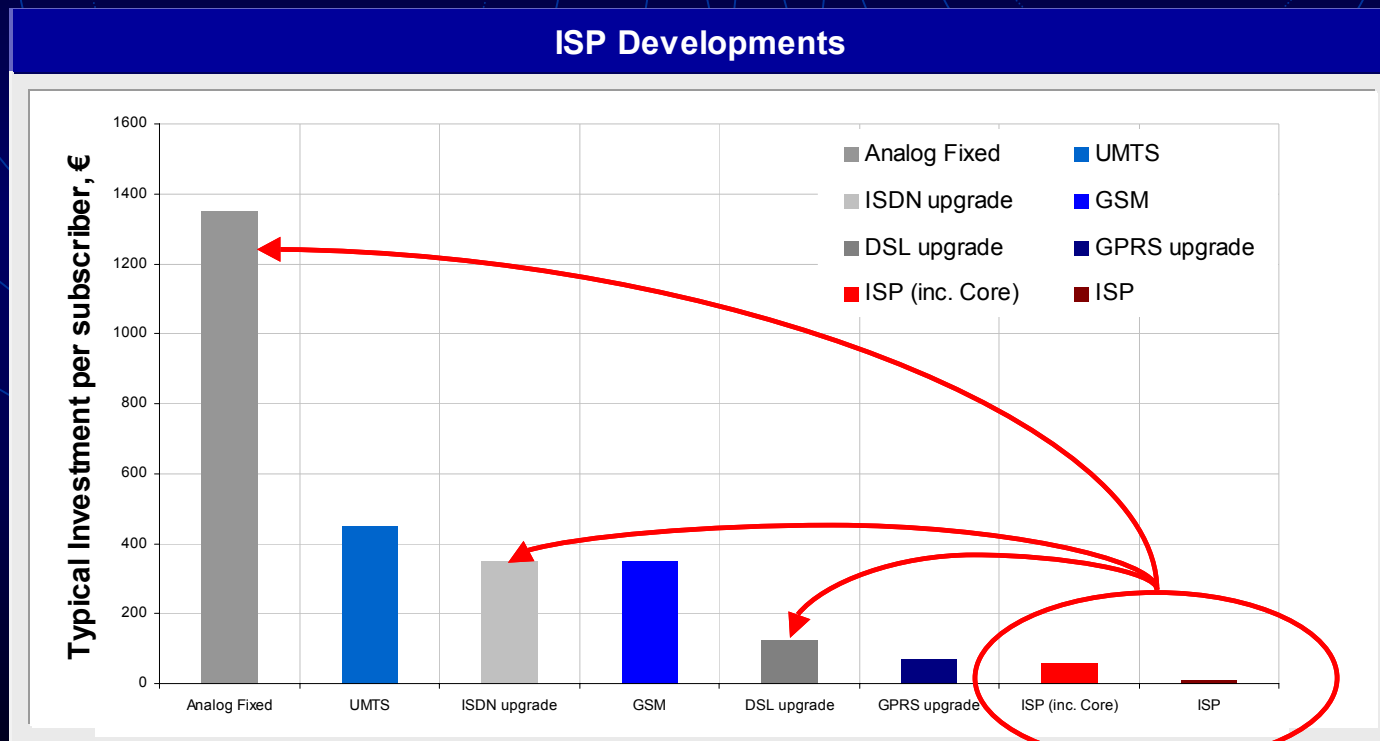
# Mobile Technology

GSM voice is likely to drive further growth, with possible "iMode" like success for GPRS and later UMTS - first internet access for many !



# ISP Developments

ISPs tend to be less capital intensive and can be considered as drivers for fixed network investments



Source: Bridge analysis



# PLC Developments

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Power Line technology may become attractive for incumbents assuming successful implementation in Western Europe - not before 2005

## PLC - An Emerging Technology

- PLC technology is a technical reality
  - ✓ Numerous field trials by European Power Utilities have established the viability of the PLC technology
  - ✓ A large volume of PLC equipment is already deployed in countries within Europe, Asia and America
  - ✓ Medium Voltage PLC is a suitable technology for the development of local access networks
- PLC has clear advantages in comparison to other access technologies
  - ✓ Low network deployment costs and fast installation due to the use of existing infrastructure
  - ✓ Only broadband always on connection technology that can be provided ubiquitously throughout the home (any plug can be used)
- Growing demand forecasts for the broadband market point out the existing opportunity for the development of PLC as a new access technology
  - ✓ From 2002 to 2004, the number of European households with broadband connections will increase from 12 M to 40 M (311%)\*
  - ✓ The entrance of PLC in the access market could potentially stimulate faster growth in broadband demand

\* Source: eMarketer, 2001



# Challenges Facing New Telecom Entrant in Africa

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- Interconnection to Public Network
- Backhaul/Transmission
- Carrier interconnection rate
- Regulatory issues
- Extreme network security issues (inc. fraud)
- Lack of experienced staff (screening also difficult)
- Planning permission process often "non-transparent"



# Definitions

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- **CDMA** – Code Division Multiple Access or spread spectrum is the digital standard (IS-95) for mobile communications.
- **DSL** – Digital Subscriber Line is a generic name for a family of digital lines (xDSL) being with a variety of different data rates provided by telephone companies.
- **EDGE** – Enhanced Data for GSM Evolution which is the final stage in the evolution of data communications within existing GSM standards. EDGE supports data transmission rate up to 364 kbps.
- **GPRS** - General Packet Radio Service is the data service for GSM with data rate up to 115 kbps.
- **GSM** - Global System for Mobile is the European standard digital cellular phone service.
- **HSCSD** - High Speed Circuit Switched Data is an enhancement of data services ("Circuit Switched Data - CSD) of all current GSM networks.
- **ISDN** – Integrated Service Digital Network which is a digital standard for fixed network and can support data rate of up to 144 kbps or 1.544 Mbps (US)/2.048Mbps (EU).
- **IS-136** – Interim Standard 136 established in the US for digital mobile standard which is based on time domain division multiple access
- **CDMA** – Code Division Multiple Access or spread spectrum is the digital standard (IS-95) for mobile communications.
- **UMTS** – Universal Mobile Telecommunications System is a technology envisioned for the next generation of GSM which is intended to support data rate of up to 144 kbps for vehicle, 384 kbps for pedestrian and 2 Mbps for in-building service.

