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Broadband Networks: Financing and Investment Strategy in Broadband – the African Experience
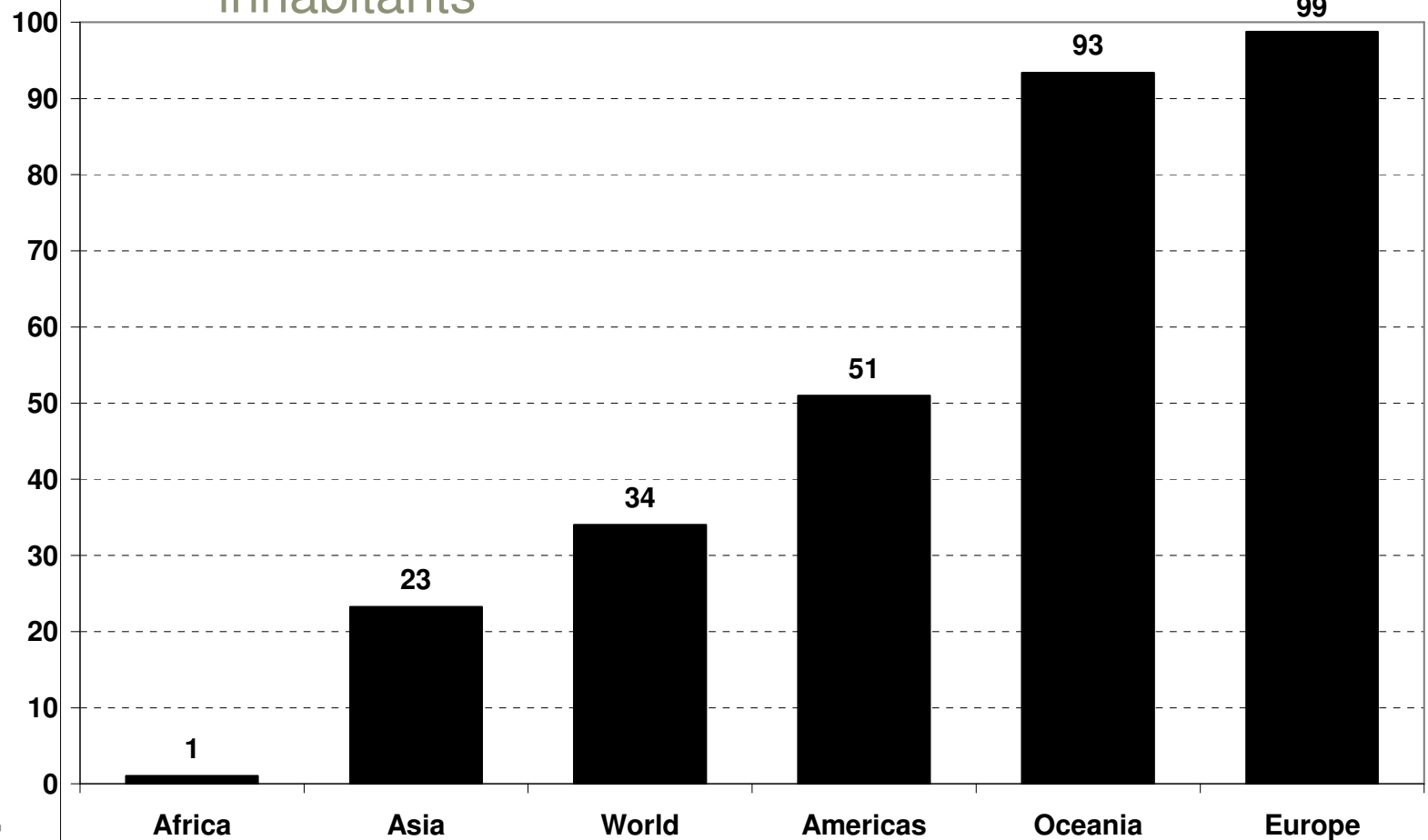
Outline

- What is Broadband?
- Current Broadband roll-out in Africa
- Wireline Broadband in Africa
- Mobile Broadband in Africa
- Fixed Wireless broadband (WiMax) in Africa
- Broadband potential in Africa
- Policy Environment

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What is Broadband?

- Broadband refers to a single channel carrying multiple formats (voice, video, text, data)
- Definition: technologies that provide speeds of at least 256 kbit/s (upstream and downstream capacity combined)
- Technically, this would include:
  - Wireline – ADSL
  - Mobile – 3G HSDPA
  - Fixed Wireless – WiMax (new technology)
- Real Broadband is usually wireline and available in much higher speeds than 256 kbit/s (therefore this would exclude mobile broadband)
- Why Broadband?
  - Higher speed than dial-up
  - VOIP
  - Convergence
  - Charging model – flat fee model

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Current Broadband roll-out in Africa

- Africa lags behind the rest of the world – broadband penetration only 1 per 1000 inhabitants

Source: ITU, Measuring the Information Society 2007

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Current Broadband roll-out within Africa

- According to ITU database, 29 out of 50 African countries do not have broadband infrastructure.
- Of those that do have, penetration is still low

Source: ITU, Measuring the Information Society 2007

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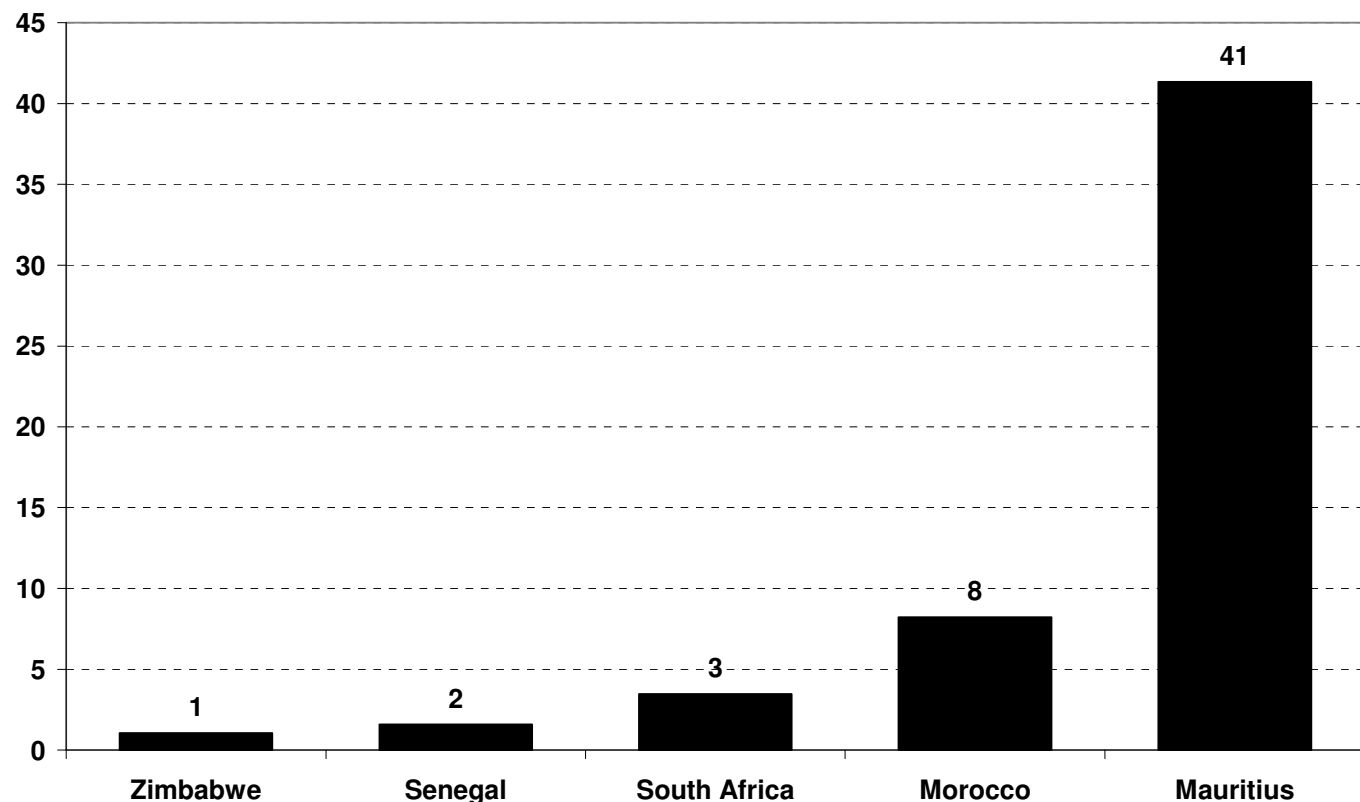
Wireline Broadband in Africa - ADSL

Requirements for an ADSL network:

- Upgrading of the local exchanges – installation of digital subscriber line multiplexes
- Upgrading of access points
- International bandwidth – to support higher capacity
- Key aspects to rollout decisions:
  - Quality and reach of existing wireline network (international, core and access network)
  - Market demand
    - Established customer base in fixed line voice and dial-up Internet,
    - wealth of customer base and spread of access equipment (computers)
    - Business customer base a key source of market demand
  - Competition for those subscribers and other services
  - Economies of scale and density
    - ADSL is rolled out in metro areas
  - Capital requirements and cash flow in upgrading
    - Pricing and rollout decisions over time

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ADSL in South Africa

- In 2002, Telkom undertook a commercial trial of ADSL in Gauteng and extended the network to other regions in the country
- Initial pricing very high/low speeds
  - ADSL customers pay both the operator and ISP
  - Bit caps and slow speeds
- Prices have come down and speeds up
  - Mobile/wireless broadband entry?
  - SNO targeting wireless broadband
  - Desire to offer triple-play (applied for IPTV licence)
- After gradual take-up, beginning to take off
  - 2003: 2 669   2004: 20 313
  - 2005: 58 532   2006: 143 000
- Cannibalised growth in dial-up subscribers
  - 2002/2003: 100%   2005/2006: 13%
- Cannibalised leased line but also extended to SMEs

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Wireline Broadband in other African countries

Sonatel's ADSL in Senegal:

- Piloted in 2002 and then launched in 2003 and extended through out the capital, Dakar
- In 2004, expansion of ADSL network to all provincial capitals and further extension in 2005

Telecom Botswana's ADSL network:

- In 2005, rolled out ADSL in response to market needs
- Initially, only four areas in Gaberone were covered. The ADSL network was to be rolled out to other areas by the end of 2005.

- Plans for roll-out of ADSL:

  - Telecom Namibia plans to roll out ADSL in Namibia

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Mobile broadband in Africa

Requirements for a 3G/HSDPA network:

- Upgrading of its network:
  - Core Network – purchase or install more capacity
  - Access network – technological upgrades to systems to handle the higher capacity
  - International bandwidth

- Key aspects to roll-out decisions:
  - Access to spectrum for service at attractive price
  - Market demand
    - established mobile voice customer base with mobile data needs – both from computer and 3G phone – option for new services
    - Access equipment bundled with contracts
    - Pre-paid model follows soon to pick up residual demand
  - Competition to attract top-end contract customers and differentiate from rivals
  - Economies of scale and density determines rollout distribution and pace
  - Existence/spread of other broadband networks

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Mobile broadband in South Africa

Vodacom launched 3G in South Africa end 2004

- Launched in order to stay at the forefront of technology and offer customers innovative services.
- Coverage in metropolitan areas where new overlay radio network built
- contract and pre-paid basis

- Rival network MTN followed six months later
- Growth has been rapid
  - 2005: 6 000
  - 2006: 37 800
- Both looking to move into mobile TV
  - Trials began in 2006 with MultiChoice content
  - Launch will be delayed until adequate spectrum allocated

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Mobile broadband in other African countries

- Emtel launched 3G in Mauritius end 2004:
  - $20 million to upgrade the network to 3G.
  - Density of Mauritius and wealth of customers means network can be accessed throughout the island
- Vodacom launched 3G in Tanzania in Feb 2007:
  - The 3G service is currently only available in Dar es Salaam
  - This service is available on both a contract and pre-paid basis

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Mobile broadband in other African countries

- Planned deployment of 3G (HSDPA) networks in Africa:

Country	Operator
Angola	Unitel
Kenya	Safaraicom
Libya	Libyana
Egypt	Vodafone Egypt
Mauritius	Cellplus Mobile Comm. Millicom Mauritius (Emtel)

Source: Global UMTS and HSDPA Operator Status, available at http://www.3gamericas.org/pdfs/Global_3G_Status_Update.pdf and operator websites

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Fixed wireless (WiMax) broadband in Africa

- Speeds up to 40mb/s within a 30km radius
  - shared by all network users at a particular time.
- Requirements for a WiMax network:
  - Components of the network – antennas, switches, access points, cabling, etc.
  - High speed backhaul network
  - Spectrum (preferably private spectrum)
- Key aspects to rollout decision
  - Alternative to ADSL for incumbent wireline
    - Facilitates access to areas that are not connected to the local loop or where this infrastructure is poor
  - Entry strategy for new operators
    - bypass incumbent operator's local loop
  - Licence and spectrum key requirements
  - Market demand
    - both home and business customers (alternative to leased lines)
  - Small scale possible (base station and backhaul)

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Fixed wireless in South Africa

- Current fixed wireless systems
  - Sentech offer to residential and business with plans for national rollout
  - WBS offers IBurst broadband service
- WiMax currently in trial
  - Telkom has trialed WiMax and has been allocated spectrum by ICASA
  - Trials by a number of other players, such as WBS, Sentech, Verizon, Internet Solutions, Vodacom, MTN and Cell C
  - SNO plans to use WiMax as local loop
  - Municipalities are looking to their own wireless broadband networks (closed or open)
- Primary issues
 - Licencing framework and spectrum access

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WiMax in other African countries

- Mozambique:
  - First country to deploy WiMax metro network
- Nigeria:
  - XS Broadband launched in Lagos, Abuja and Port-Harcourt
- Namibia:
  - MWEB has launched WiMax in Windhoek and soon in Swakopmund and Walvis Bay
  - Telecom Namibia launched a WiMax network in Windhoek with plans to expand
- Ghana:
  - InternetGhana has just introduced Third Generation WiMax in Accra, Tema and Kumasi with plans for expansion
- Angola:
  - MundoStartel (Telecom Namibia's joint venture) plans to launch wireless network in Luanda in July 2007

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Broadband potential in Africa

- As with voice, wireless holds the most promise
  - Wireline networks often poor with limited customer base
  - Mobile operators can leverage core network, large existing customer base
  - WiMax supports small scale and dispersed entry, able to leverage business and residential markets
- But high bandwidth core network still a requirement
  - Backhaul for wireless networks, international connectivity
- Competition also still matters
  - Companies aim to capture high end, differentiate from others, and bundle multiple services (triple play)

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Broadband distribution in South Africa
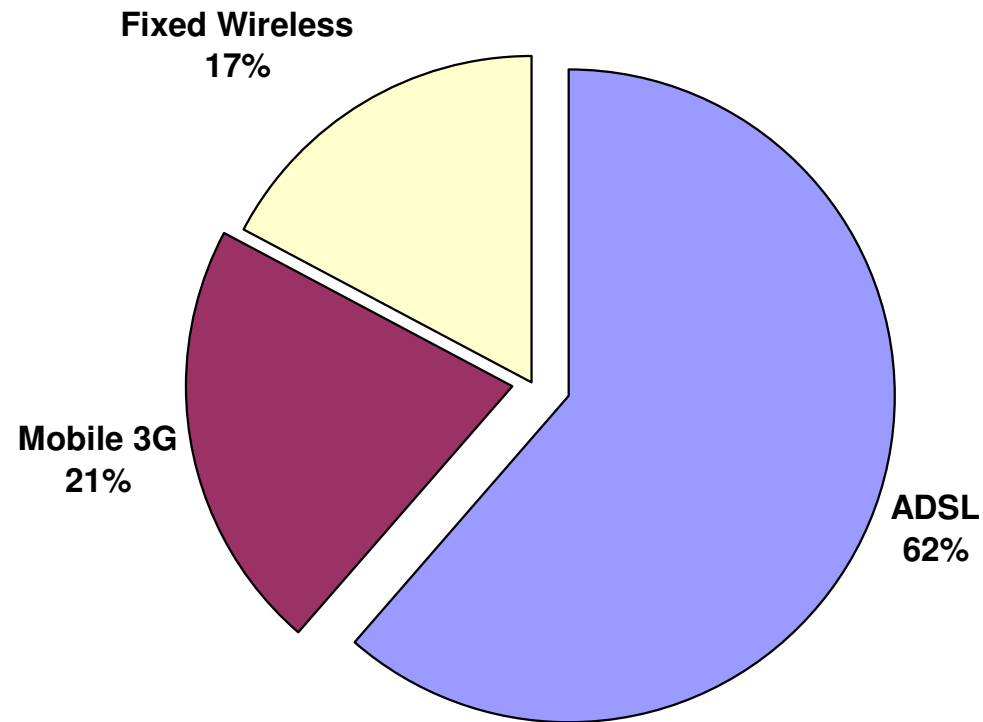
Source: Various, Genesis Analytics

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Policy Environment

- General policy support for broadband required to promote rollout
  - Spectrum Allocation – for WiMax and Mobile technologies
  - International Bandwidth costs and access
  - Competition – new and/or no licencing for fixed wireless
  - Removal of taxes on access equipment
- More active policy support for broadband
  - Government user – early and lead adopter
  - Inclusion of broadband in universal service policy
    - Currently only Mauritius, Sudan and Zimbabwe.*
  - Fibre optic backbone where not available

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* ITU ICT EYE Country Reports