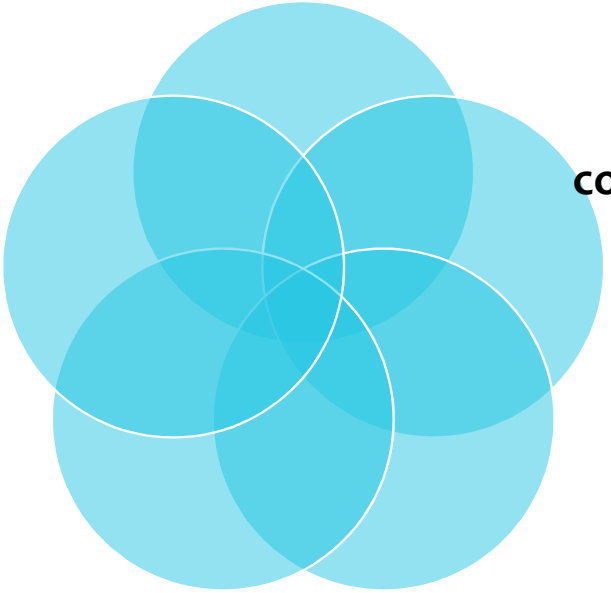
Business Impact of Broadband connectivity

Banjul 11-13 october 2023

Day 1

BROADBAND OVERVIEW CONNECTIVITY

1- Introduce the general concepts of broadband

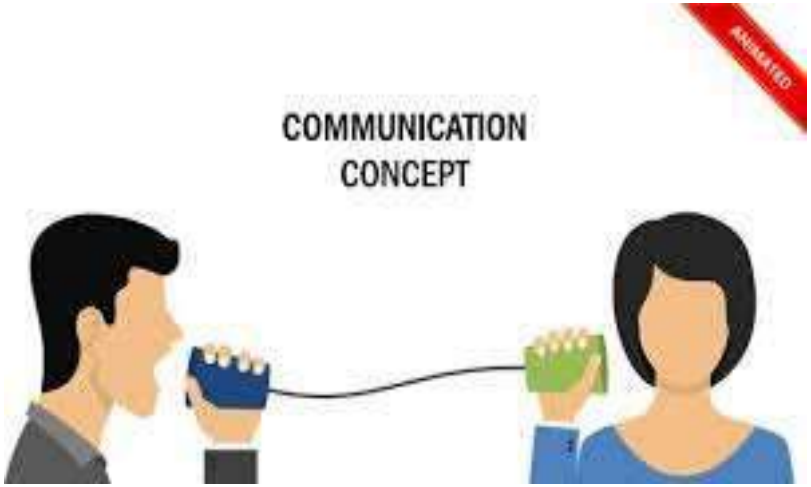


2- Broadband connectivity in Africa

3 –Broadband Worldwide initiative

4 –Case study

5 Questions



Session 1

Introduce the general concepts of broadband

- What Is broadband?
- How does it work?
- What are its advantages?
- What types are available?

What Is broadband?

Broadband or high-speed Internet access allows users to access the Internet and Internet-related services at significantly higher speeds than those available through "dial-up" services. Broadband speeds vary significantly depending on the technology and level of service ordered. Broadband services for residential consumers typically provide faster downstream speeds (from the Internet to your computer) than upstream speeds (from your computer to the Internet).

Broadband is synonymous with high-speed Internet access. While the International Telecommunication Union (ITU) defined broadband as 256 Kbps in 2003,2 by 2021, mobile broadband speeds averaged 40 Mbps in high-income countries, 13 Mbps in lowerincome and middle-income countries, and below 10 Mbps in sub-Saharan Africa.

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How does it work?

Broadband allows users to access information via the Internet using one of several high-speed transmission technologies. Transmission is digital, meaning that text, images, and sound are all transmitted as "bits" of data. The transmission technologies that make broadband possible move these bits much more quickly than traditional telephone or wireless connections, including traditional dial-up Internet access connections.

What are its advantages ?

- Broadband is an important tool for expanding educational and economic opportunities for consumers in remote locations.
- Broadband allows you to take advantage of services not available or not convenient to use with a dial-up Internet connection, such as Voice over Internet Protocol (VoIP), an alternative to traditional voice telephone service.
- Broadband makes "telemedicine" possible: patients in rural areas can confer online with medical specialists in more urban areas and share information and test results very quickly.
- Broadband helps you efficiently access and use many reference and cultural resources via the Internet.
- You also need broadband to best take advantage of many distance learning opportunities, like online college or university courses, and continuing or senior education programs.
- Broadband allows you to shop online more quickly and efficiently.

What types are available?

Broadband can be provided over different platforms:

- Broadband can be provided over different platforms:
- Digital Subscriber Line (DSL)
- Cable Modem
- Fiber
- Wireless
- Satellite (GSO, MEO,LEO)

The broadband technology you choose will depend on a number of factors. These include how broadband Internet access is packaged with other services (like voice telephone and home entertainment, IVR, Game online), price and service availability.

Digital subscriber line (DSL)

Broadband can be provided over different platforms:

- Digital Subscriber Line (DSL)
- Cable Modem
- Fiber
- Wireless
- Satellite
- Submarine cable

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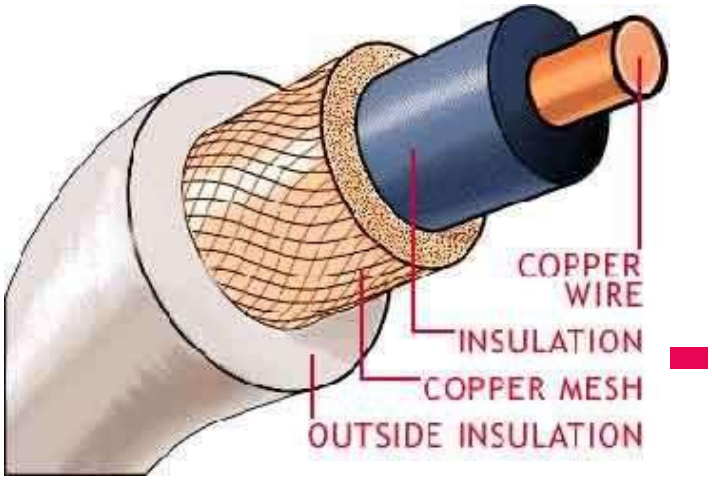
Cable modem

Cable modem service enables cable operators to provide broadband using the same coaxial cables that deliver pictures and sound to your TV set, though you can still watch cable TV while using a cable modem service. Transmission speeds vary depending on the type of cable modem, cable network and traffic load. Speeds are comparable to or exceed typical residential DSL.



Wireless

- Wireless fidelity (WiFi) connects end-user devices to a local Internet service via short-range wireless technology. WiFi allows users to move WiFi-enabled devices around within their homes or businesses. WiFi is also widely available in many public "hotspots."
-
- Fixed wireless technologies using longer range directional equipment can provide broadband service in remote or sparsely populated areas where other types of broadband would be too costly to provide.
- Mobile wireless broadband services are also widely available from mobile broadband service providers. Mobile wireless broadband service is typically slower than either wired or fixed wireless alternatives.

Satellite

Satellite is part of the mix of technologies that enable economic growth

- Fixed Satellite Services for Broadband Access Networks
  - Provides last-mile connectivity to reach most remote locations
  - Allows for rapid deployment
  - Provides ubiquitous communications to multiple geographically
  - disperse sites
  - Allows communications to remain secure and trusted
  - Allocates bandwidth on an as-needed basis to drive economics
  - Provides the best method for multicast overlay of media-rich content

Submarine cable

Cable is located in the bottom of the sea is part of a global network carries remoting between countries.

- This was the beginning of the cables in 1850 by a submarine cable was conducted between England and France were used for the transmission of information by telegraph only.
- Starting in 2003 linked the submarine cables all over the world except Antarctica.
- All modern cables use fiber optic technology to carry digital data is then used to transfer the movement of the phone with the Internet and information.
- Quiz: In what year was the first Submarine cable installed?

History For Marine Cable :

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- Cable reached 69 mm in width, and weighs about 10 kg / m although the use of cables thinner and lighter in places deeper

In Fact Submarine Cable

Different Between Submarine Cable VS Satellites information transfer

- For contact via satellite, it is available but can not be relied upon only because they simply will not bear the intense pressure, in addition to the submarine cables transmit information more quickly because the direct contact while satellite communication is not direct (land - Satellite - land), not to mention safety if he can be the subject of espionage and pick up information transmitted via satellite if it were not sufficiently encrypted.

About How This Damage Marine Cable:

- Damage can occur to the cable because of fishing vessels, fish, earthquakes, volcanoes or the enemies of this cable cut off in the event of wars, God forbid.

The causes of crashes cables and parts come from the "main re

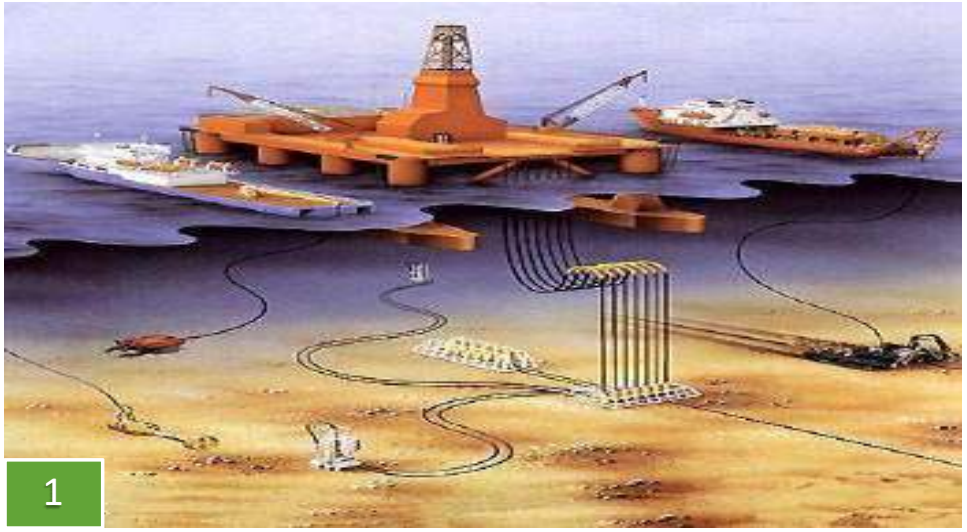
- The erosion of the outer shell after a long time (leading to water leakage to the inside) and this rare and almost virtually non-existent
- Ships and navigation system good of others (where berths those ships during the stand lead to cut those cables) and this happens a lot

Cases of repairing the damage in the cable

1. **In the event of damage to a cable in <u>the coastal areas:</u>**is lifted out of the water by the cable and fix it on the private deck cranes.

2. **In the event of damage in Cable <u>Average depth</u> :** is lowered technicians in special capsules are similar submarines to be fixed in position.

3. **In the event of damage to the cable interconnection in <u>very deep areas</u>**:are cut cable from two sides and the installation of a new link so that it is longer than the link severed and placed on the U-shaped

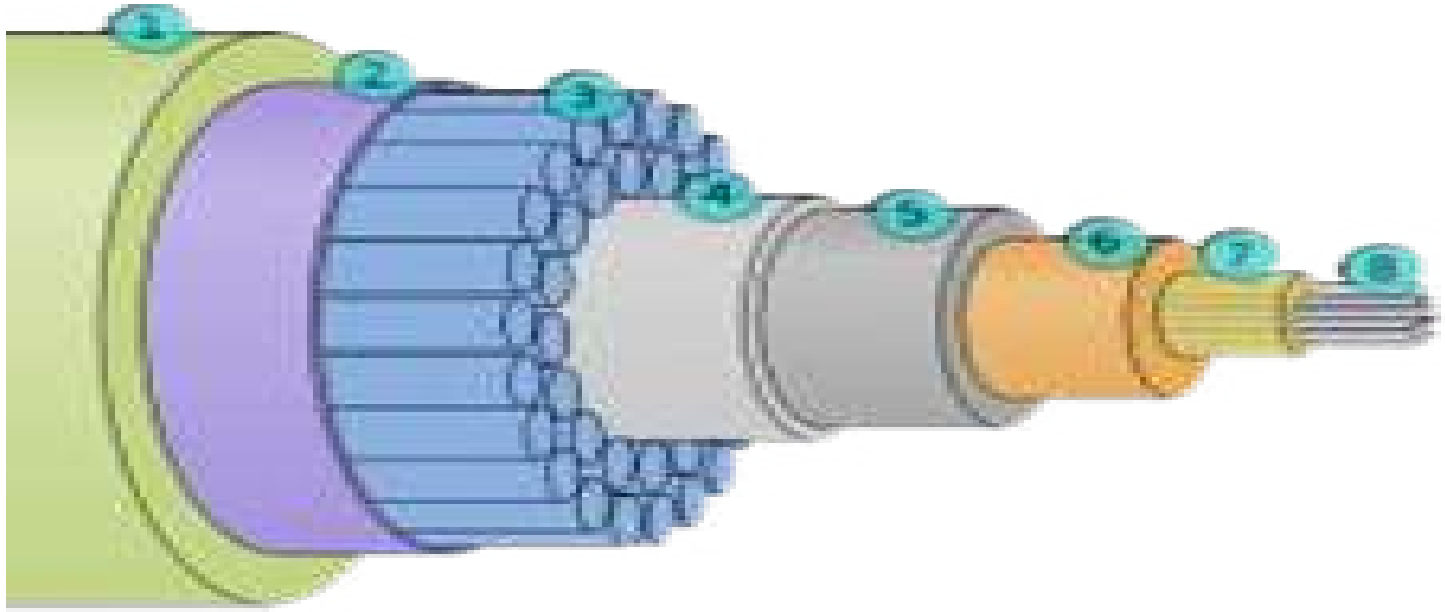


1

2

Submarine Cable Layers:

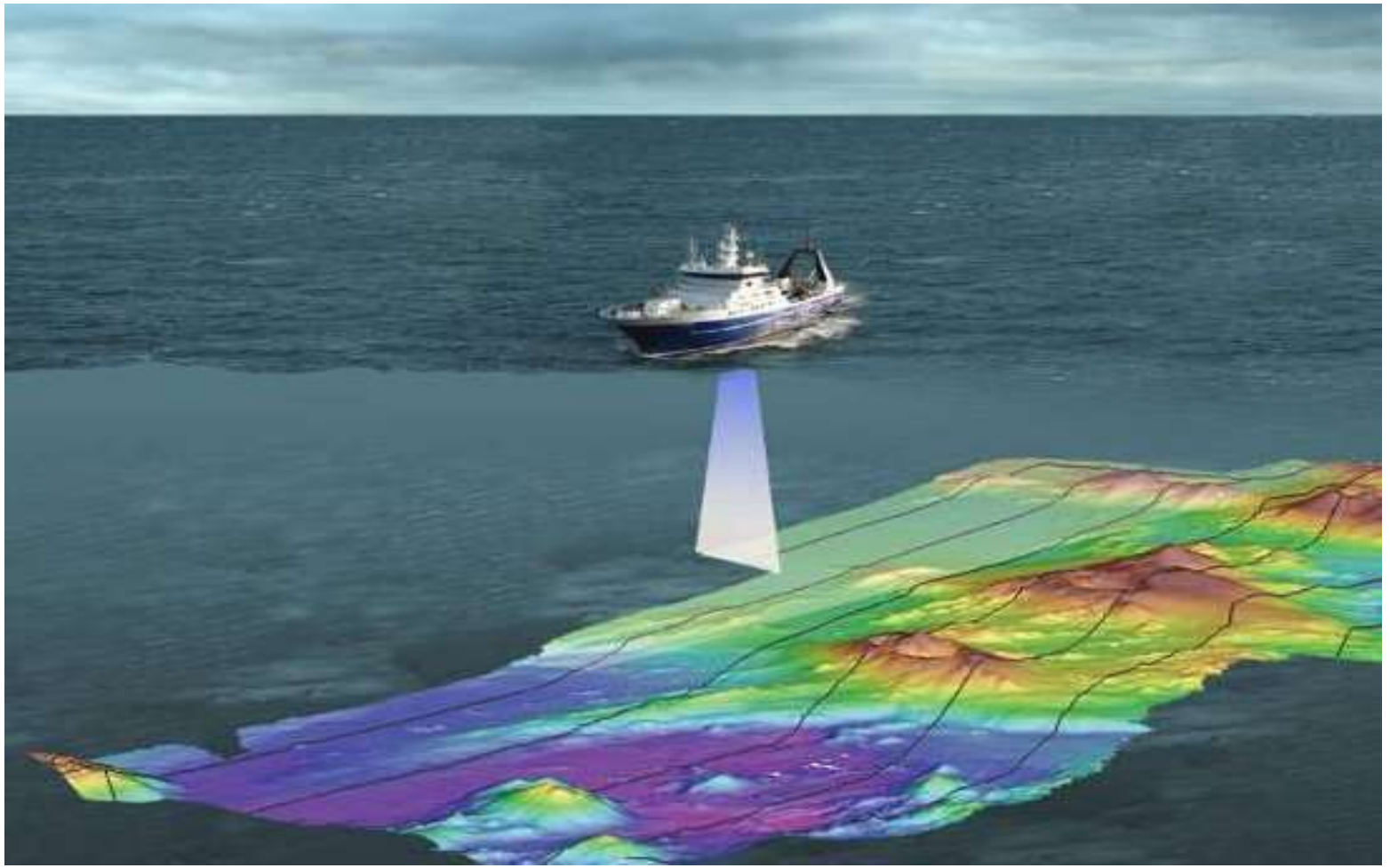
The new cable is characterized by a private liner composed of several layers each layer has a special function to maintain the integrity of the cable and transfer information quickly and without problems.



1. The first layer is composed of polyethylene of a chemical water-resistant.
2. The second layer is a plastic material accurate name Mylar.
3. The third layer is composed of steel wire monolith.
4. The fourth layer is a barrier Aluminum Waterproof.
5. Fifth layer consisting of the material Polycarbonate is a special shock-resistant chemical and degree of extreme heat.
6. Sixth layer is aluminum Hijaz extra.
7. Seventh layer consisting of Alptrulatum (such as Vaseline), a very dense and solid.
8. eight layer class consisting of fiber optic.

How Submarine Cable Repair In The Event Of Damage To Him?

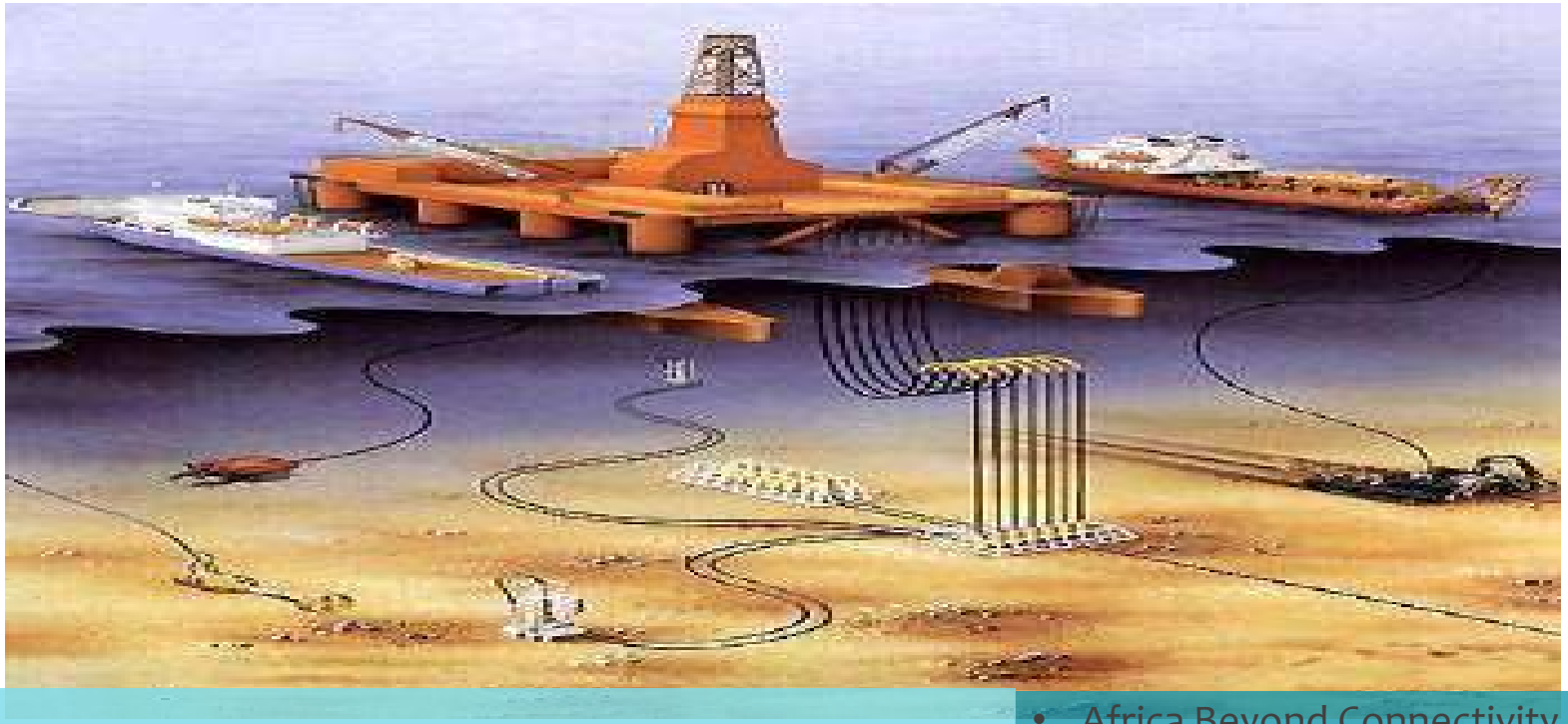
The company must first locate the holidays, then start identifying the place more through communication stations surrounding the problem beaches, to start after engineers cables locate objects more precisely by sending pulses of light through those cables, and in the case of the proper cable will reach optical pulse the other side of the sea, while in the case of damaged or severed cable will not reach that pulse to the other party, and backfire again to the source By calculating the time that it takes the pulse to go back and engineers can then locate precisely holidays.



The company sends ship large cables carrying several miles of new fiber-optic cables to the process of reform by lifting the damaged portion to the ship and fix them, if the cables are under greater than 6,500 feet deep below the surface of the water the crew send a robot looks like a tank and can walk on the bottom sea is extended to those cables, and when it reaches the site of the holidays is cut damaged cables and replace them with new cables, damaged cables and took him to the ship.

How To Extension The Cable In The Sea?

These cables are extended by private ships there are a few companies have the costs are too high could reach hundreds of millions of dollars, depending on the length of the cable also Bandwidth.

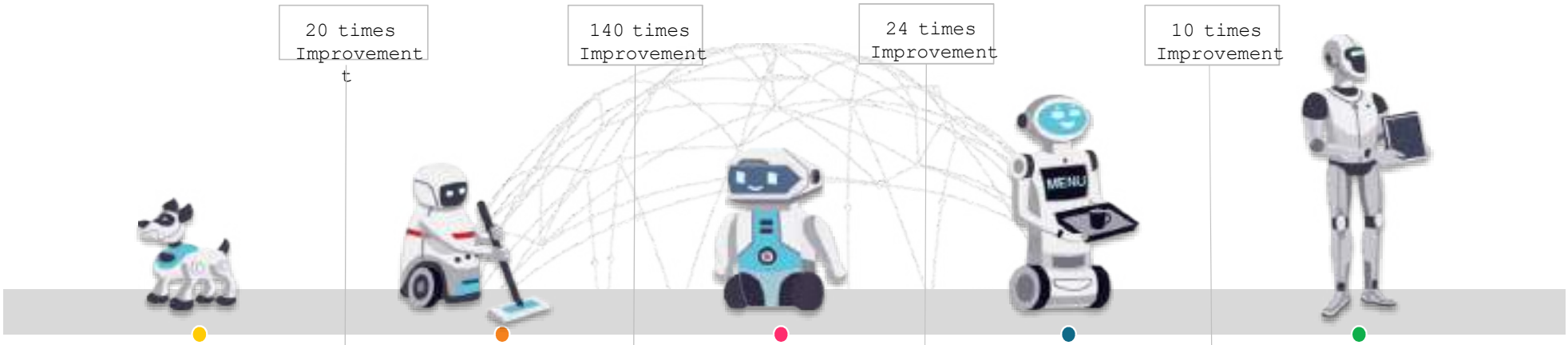


Session 2

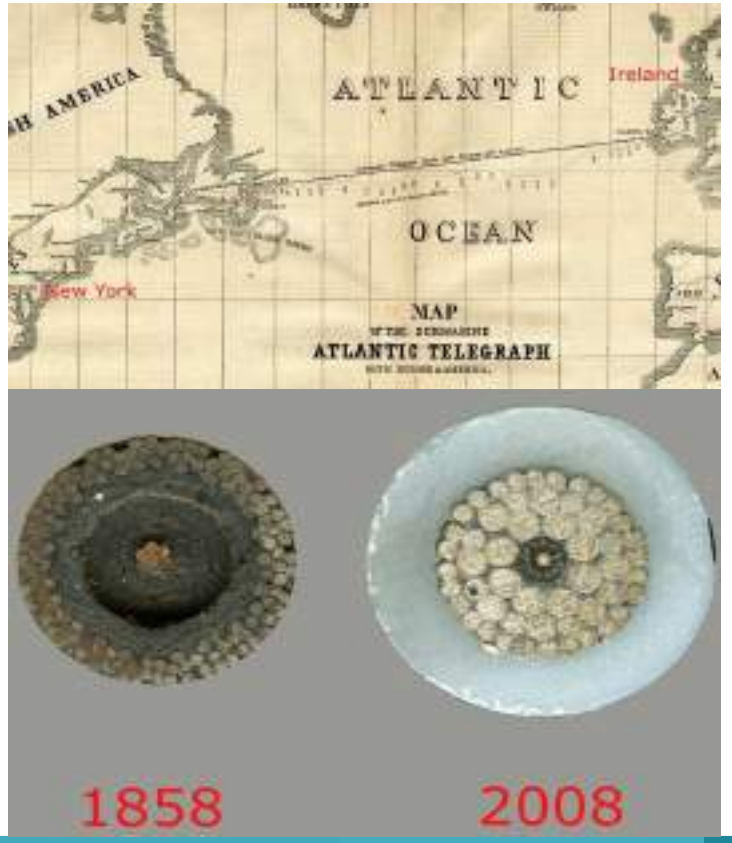
Broadband connectivity

The evolution of connectivity

The evolution of Connectivity

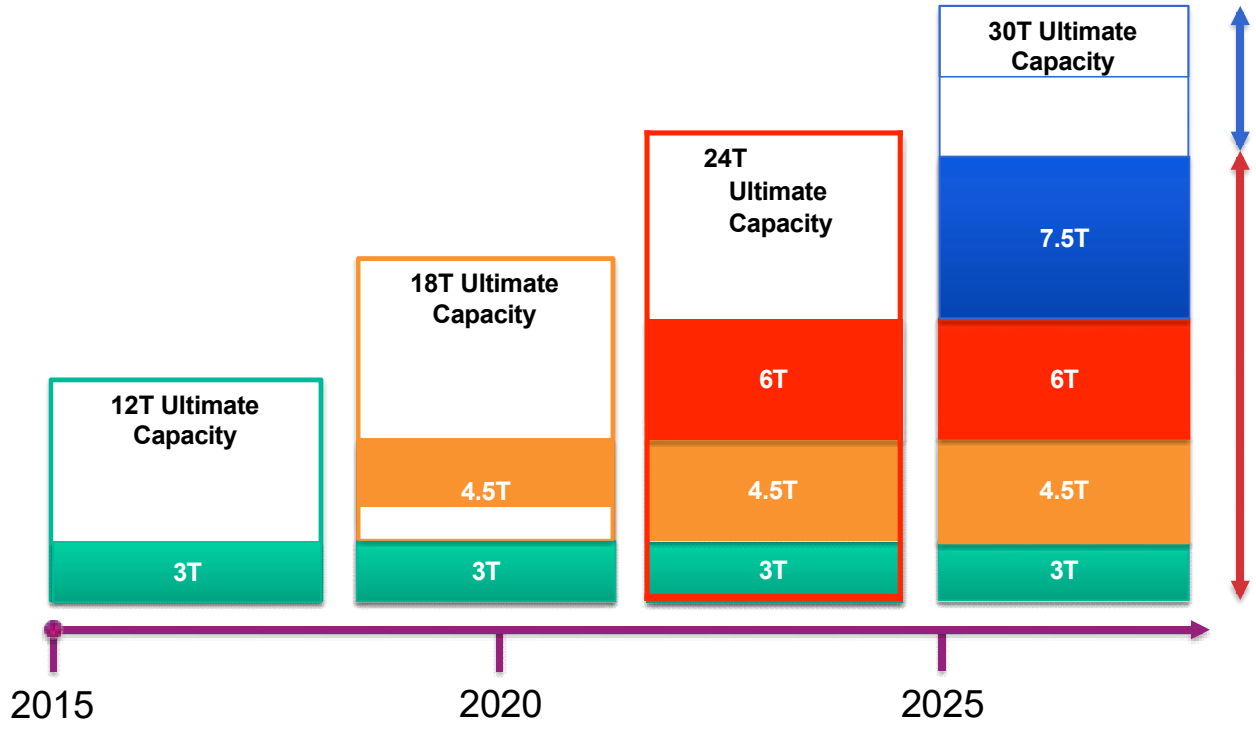


The evolution of submarine cable



Source: TeleGeography

Grading 25% of Spectrum with Each Technology Generation



Additional 9T to reach Max Capacity potentially requires rip and replace

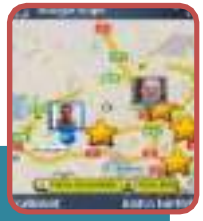
Spectrum 100% Occupied with 21T

LTE Enhances Wireless Broadband User Experience

LTE will change the Way of Connection & Communication

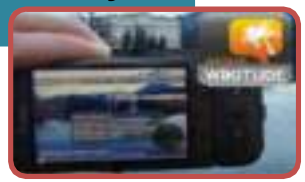
Communities, sharing

News, information anywhere



Location

Augmented reality



Navigation

Machine 2 Machine

Music and entertainment

Business on the move, email

Session 4

Worldwide initiative on broadband: ITU Broadband commission

UN Broadband initiatives

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Broadband commission Initiatives

The Broadband Commission for Sustainable Development (Broadband Commission), set up in 2010 by the ITU and the United Nations Educational, Scientific and Cultural Organization (UNESCO), promotes broadband policy on the global agenda and encourages governments to adopt national plans.

Broadband Advocay Target

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MAKE BROADBAND POLICY UNIVERSAL

By 2025, all countries should have a funded National Broadband Plan (NBP) or strategy, or include broadband in their Universal Access and Service (UAS) Definition

155 countries had a national broadband plan or other digital strategic document emphasizing broadband in 2022, down from 165 in 2021. **The number of economies with a broadband plan has slightly decreased**, as plans have expired and haven't been renewed in some countries. While a plan is a useful starting point, it is important to know how well they are operationalized.

ADVOCACY TARGET 01

Broadband Advocay Target

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MAKE BROADBAND AFFORDABLE

By 2025, entry-level broadband services should be made affordable in low- and middle-income countries at less than 2% of monthly Gross National Income (GNI) per capita

According to the ITU's 2022 Facts and Figures report, where data are available for both 2021 and 2022, **more economies met the two percent affordability target for all five baskets of ICT services in 2022 than did so in 2021.** Thus, 103 economies met the target with respect to the data-only mobile broadband basket in 2022 and 71 economies met the target with the fixed broadband basket (in each case 7 more than in 2021).

ADVOCACY TARGET 02

Broadband Advocay Target

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GET EVERYONE ONLINE

By 2025, broadband-Internet user penetration should reach: i) 75% worldwide; ii) 65% in low- and middle-income countries; and iii) 35% in least developed countries

ITU data find that Internet penetration increased as a result of the pandemic, growing to an estimated 66% of the total global population in 2022, up from 54% in 2019. This represents an annualized growth rate of 6.1% over 2021, but pales in comparison with the 11% for 2019-2020 seen at the beginning of the COVID-19 pandemic. With 2.6 billion people offline, there is a pressing need for significant action to achieve universal and meaningful connectivity by 2030.

ADVOCACY TARGET 03

Broadband Advocay Target

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PROMOTE DIGITAL SKILLS DEVELOPMENT

By 2025, 60% of youth and adults should have achieved at least a minimum level of proficiency in sustainable digital skills

Digital literacy is one of the main causes of digital exclusion and often among the top answers when people are surveyed about why they do not use the Internet. According to the latest available data from the ITU, the relatively low level of skills in countries providing data contrasts against their high share of overall Internet use – 86%. This gap between individuals using the Internet and those with digital skills demonstrates that many may be using the Internet without being able to fully benefit from it or avoid its dangers. Challenges persist with regards to the data availability and interpretation of this indicator, which limit interpretations about global digital literacy.

ADVOCACY TARGET 04

Broadband Advocay Target

INCREASE USE OF E-FINANCE

By 2025, 40% of the world's population should be using digital financial services

Digital financial services present a tremendous opportunity to swiftly increase the number of people using the Internet and extend access to the social and economic benefits of digital resources. **According to the latest data from the World Bank's FINDEX survey, 64% of people aged 15 years and older made and/or received digital payments in 2021.** This figure exceeds the target of 40% on a global basis. While low and lower middle-income countries and South Asia have not yet reached the target, they are on track to achieve it by 2025.

ADVOCACY TARGET 05

Broadband Advocay Target

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GET MSMEs ONLINE

By 2025, improve connectivity of micro-, small- and medium sized enterprises (MSMEs) by 50%, by sector

Connectivity data disaggregated by enterprise size is widely available for high-income nations, although not always for micro-enterprises. **For most low- and middle-income countries, even aggregated data on total enterprises with Internet access is not available, let alone by sector.** Hence it is difficult to gauge the severity of the problem. The nature of the connectivity is also important. A one-person micro enterprise might find having a smartphone with wireless access sufficient to carry out operations, particularly for social media based online selling.

ADVOCACY TARGET 06

Broadband Advocay Target

BRIDGE THE GENDER DIGITAL DIVIDE

By 2025, gender equality should be achieved across all targets

According to the latest ITU estimates, **69% of men were using the Internet in 2022 compared to 63% of women. Gender parity increased from 0.90 in 2019 to 0.92 in 2022.** Some regions and income groups have reached gender parity in Internet use including high-income countries, SIDS, the Americas, CIS countries and Europe. The substantial gender gap in mobile Internet use in LMICs had been improving previously, driven primarily by South Asia where it decreased significantly from 67% in 2017 to 36% in 2020, according to GSMA. However, notable gender gaps in mobile Internet access persist in LMICs, and in some countries, the mobile Internet gender gap has even increased.

ADVOCACY TARGET 07

Session 3

Broadband connectivity

Broadband connectivity in Africa

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Broadband in Africa

Digital technologies and the digital economy will have a transformative impact on development. Today's economy is being driven by digital transformation across all sectors and digital technology is increasingly at the center of people's daily lives. Indeed, several Sustainable Development Goals (SDGs) require information and communication technologies (ICTs) as an enabler, notably to achieve universal identification, more efficient delivery of government services, financial inclusion, and job creation. Furthermore, digital transformation will impact key sectors of the economy

Brodadband is changing the World

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Big Data

90%

of the data created in the last two years alone.

Mobile

1 billion (plus)

(plus) smart devices shipped in 2013 alone.

Social

81%

of customers depend on social sites for purchasing advice.

Cloud

62%

of total workloads will be in the cloud by 2016.

Internet of Things

50 billion

devices connected to the internet by 2020.

API Economy

Global m-commerce

85 billion

in 2013 and forecast to rise to $120 billion by 2015 and an estimated $1 trillion by 2017

World is Changing

Africa Broadband Outlook

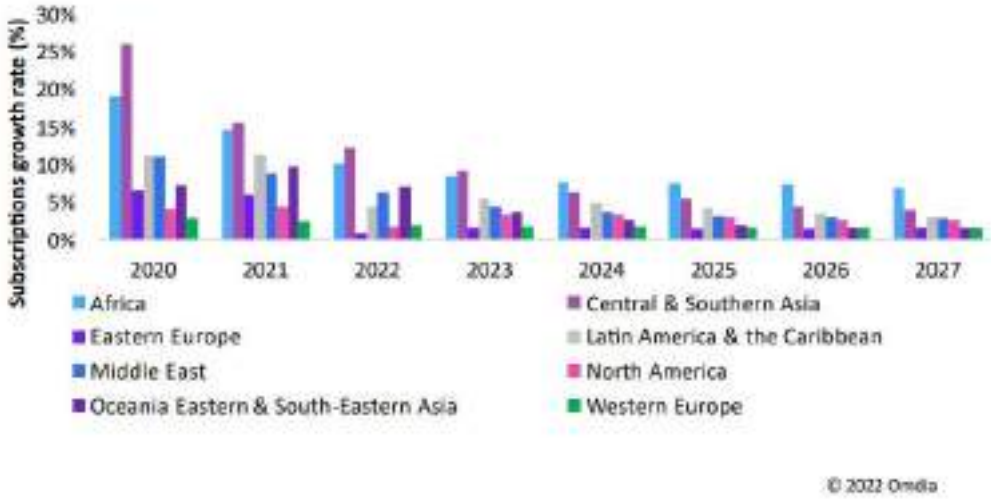
it is Improved that broadband connectivity plays a key role in accelerating economic growth and increasing the GDP, particularly in developing markets such as sub-Saharan Africa. The increased opportunities in ICT accelerate job creation by unlocking new digital opportunities in key sectors of the economy, including e-health, e-agriculture, e-education and transport.

According to the ITU, a 1% increase in mobile penetration in Africa is estimated to increase GDP by 0.25% (ITU, 2019). Africa's mobile broadband penetration increased from just under 30% in 2018 to just over 40% in 2021, and this 10 percentage-point increase corresponds to an increase of 2.5 percentage points in GDP. Further studies by IFC show that expanding internet penetration in Africa from the 33% (2020) to 75% has the potential to create 44 million new decent jobs. The provision of universal, affordable high-speed broadband connectivity in Africa is therefore critical to the realisation of a digital ecosystem that supports innovation in new sectors of the digital economy.

Africa Broadband Outlook

Total fixed broadband subscriptions increased from 28 million in 2020 to 32.1 million in 2021, while penetration increased from 10.2% to 11.4% over the same period. Africa is projected to record the highest fixed broadband subscriptions growth rate between 2024 and 2027. The strong growth is attributed to the rising demand for high-speed broadband connectivity and increased affordability of services occasioned by a decline in tariffs and the expansion of fixed broadband infrastructure, such as optical fibre and fixed wireless networks.

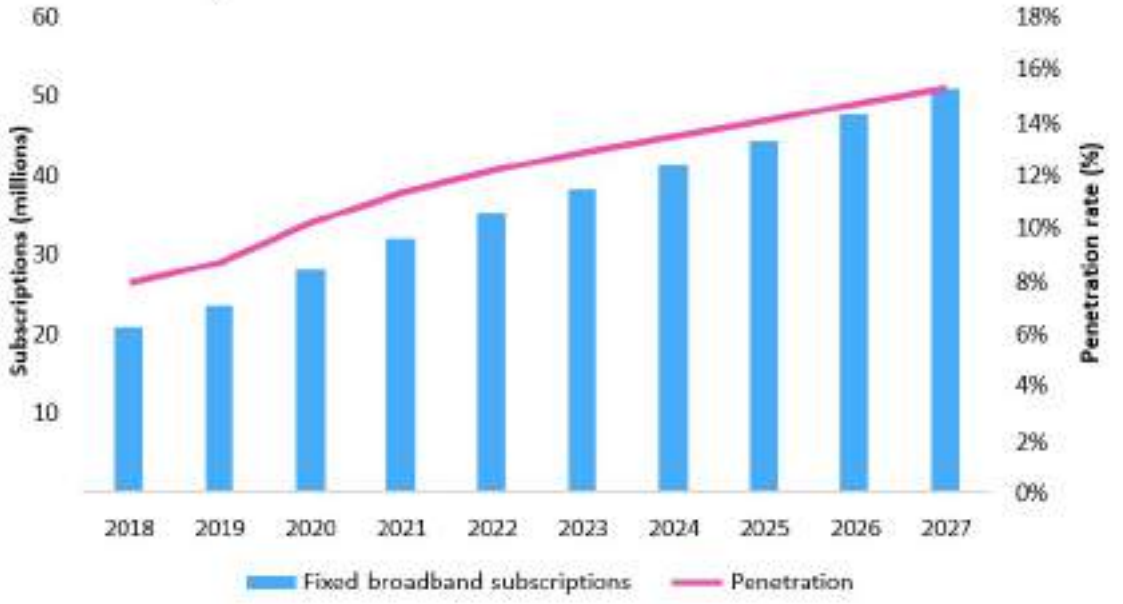
Figure 1: Fixed broadband subscriptions growth rates by world region, 2020–27



Africa Broadband Outlook

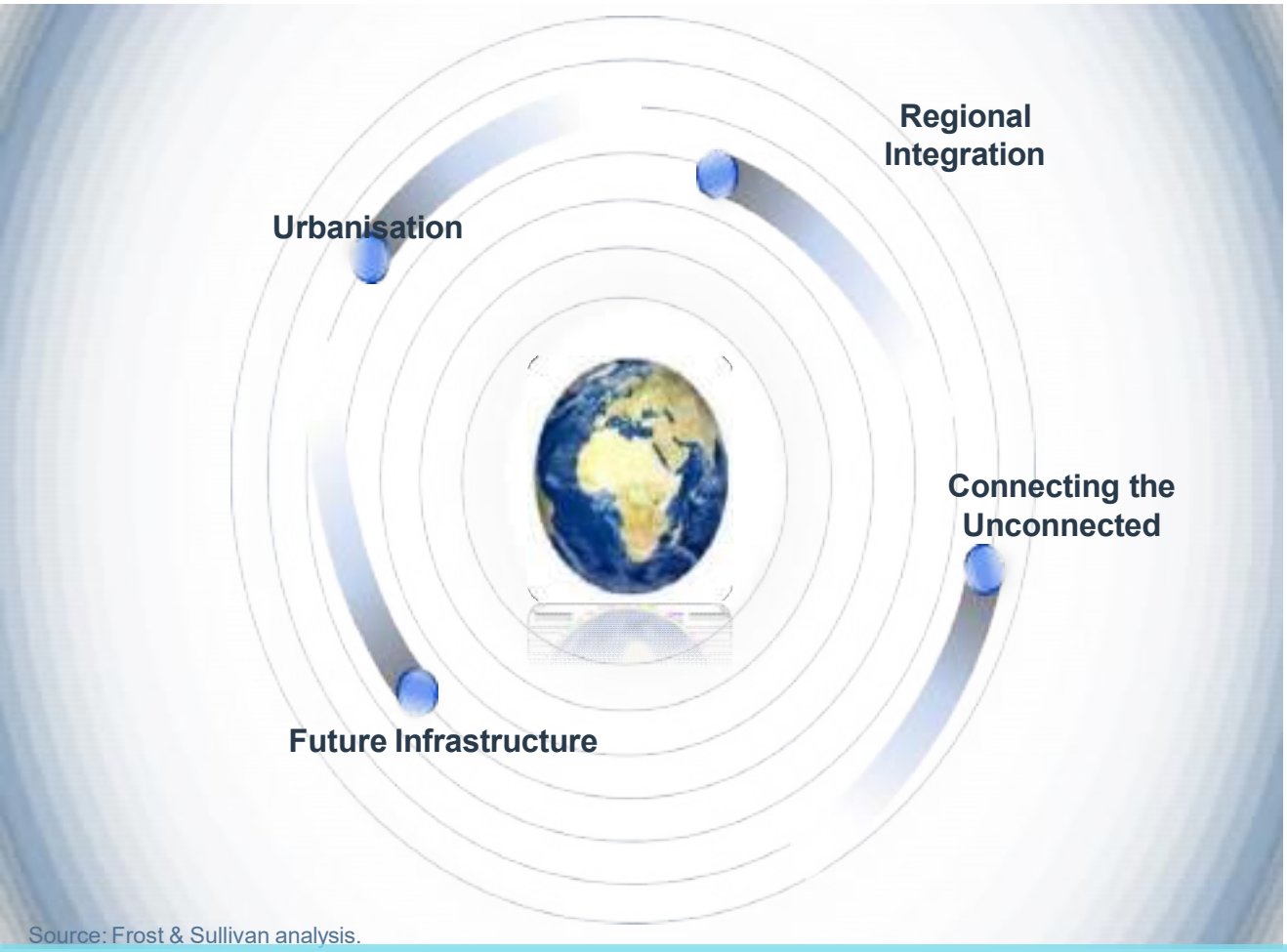
Africa will have 51 million fixed broadband subscriptions and a household penetration rate of 15.3% by end-2027 (see **Figure**). This compares to a global fixed broadband subscription figure of 1.59 billion and a penetration rate of 65.6%. With this projection, Africa is on track to achieving a household penetration rate of above 20% by 2030, which is part of the Africa Broadband Vision 2030 goal of connecting every African with broadband to achieve a stable and connected digital Africa by 2030

Figure 3: Africa fixed broadband subscriptions forecast, 2018–27



Source: Omdia

The megatrends impacting the ICT sector in Africa over the next 5 to 8 years



Source: Frost & Sullivan analysis.

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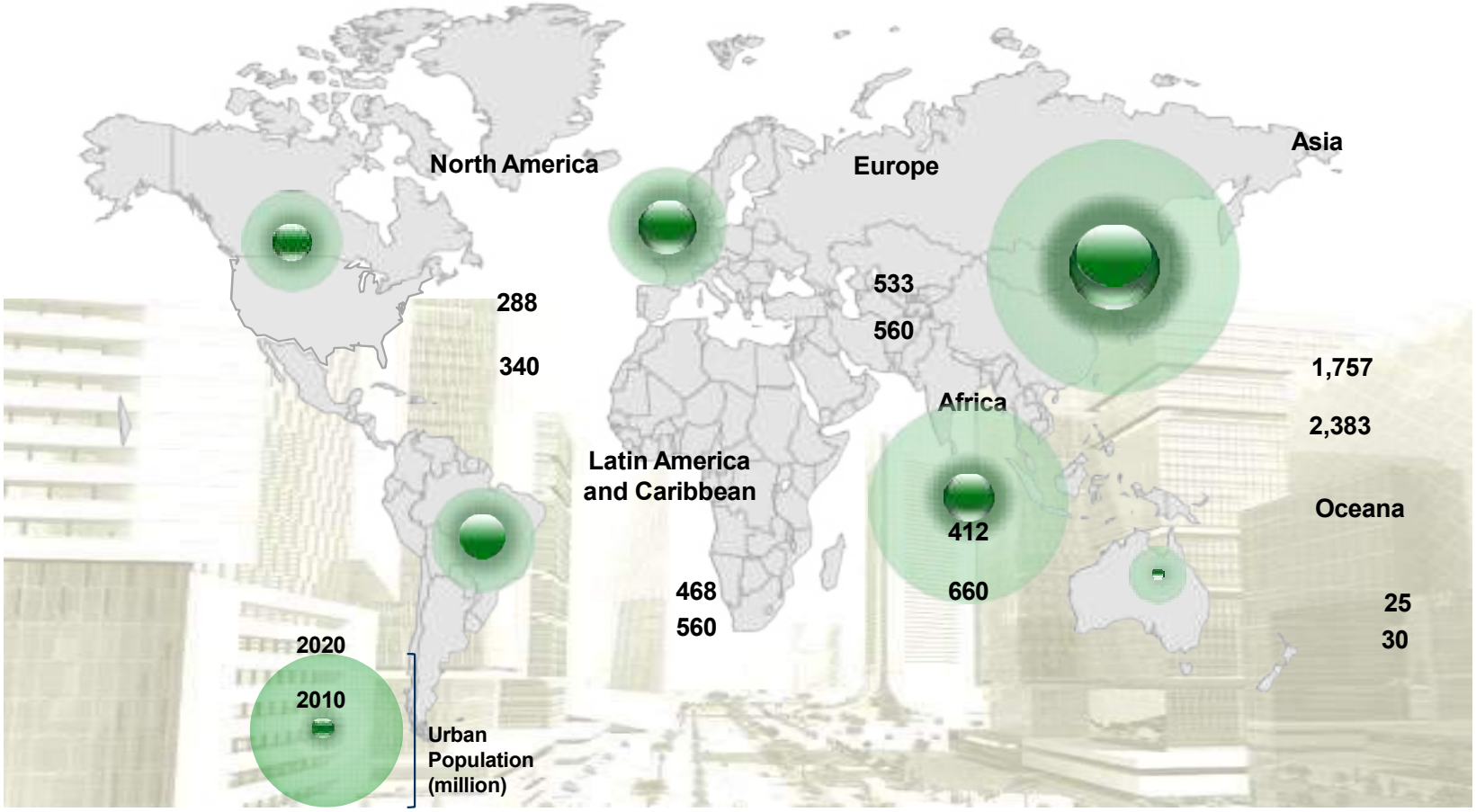
As a region, Africa will possess the second largest number of urban occupants by 2025

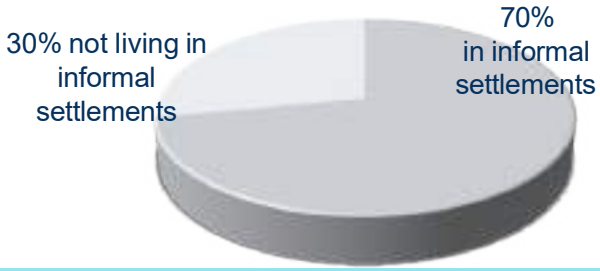


Seventy % of urbanised Africa will live in informal settlements

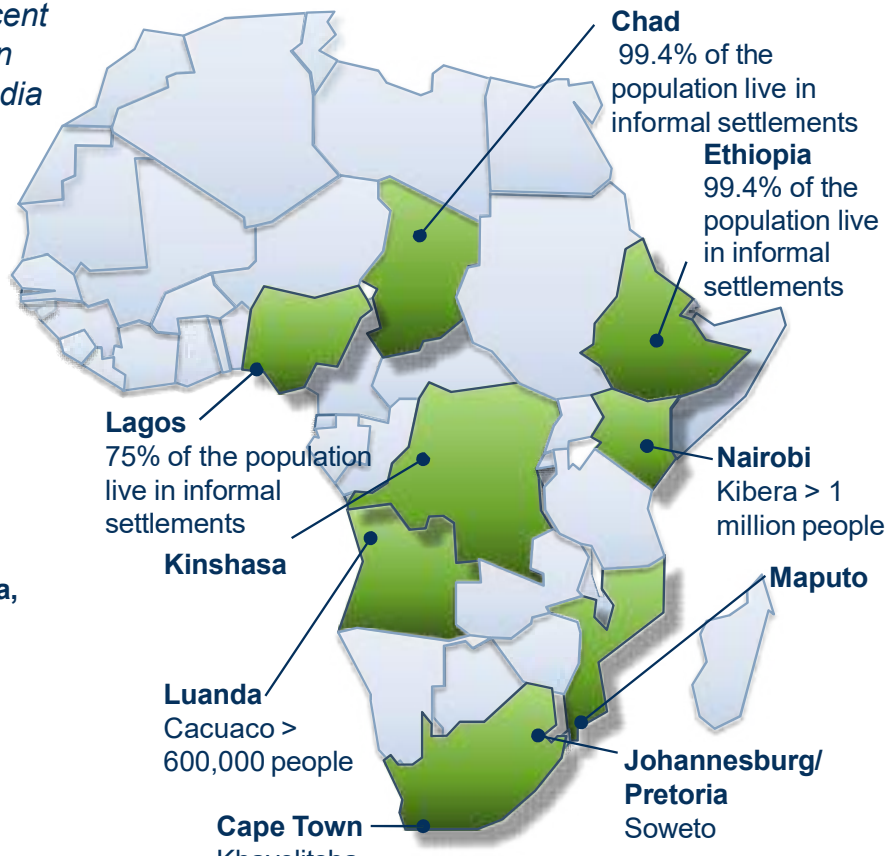
Splintered Urbanisation

African urban communities will comprise 70 per cent informal settlement dwellers living alongside an emerging middle class roughly equal to that of India

Percent of Urban Residents by Type of Settlement, Africa, 2050



Major Informal Settlements, Africa, 2050



Source: UN-Habitat, Frost & Sullivan analysis.

African cities will require resource efficient technologies to meet so challenges and business opportunities

Cairo

Cairo is expected to grow from 11 million in 2010 to over 13.5 million by 2025; it is the only mega city, by definition, in Africa.

Lagos and Eko Atlantic City Region

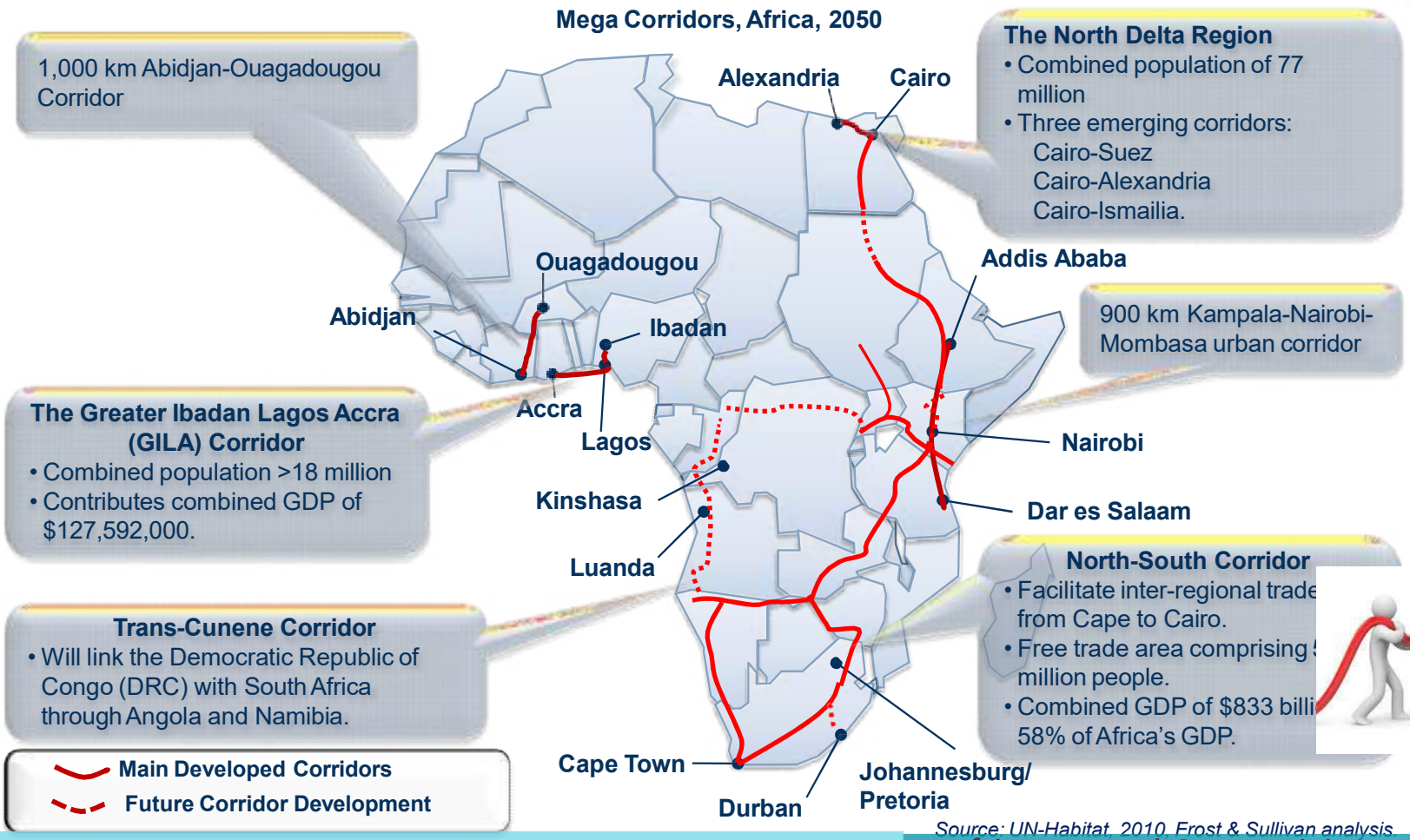
Lagos's Eko Atlantic City will merge with the city of Lagos to form a future business gateway to Africa—a mega region of over 16 million.

North South Corridor

Transport routes across the region will be expanded and integrated to create corridors for trade and inter-continental co-operation by linking mega cities.

Source: Frost & Sullivan analysis

Corridors will unlock economic potential of landlocked countries and will improve inter-dependence among cities, leading to regional economic growth



Source: UN-Habitat, 2010, Frost & Sullivan analysis

An integrated continent – development in intra-trade and key infrastructu development

Power, Transport and Trade Integration (Africa), 2010 – 2020

2020

Total Intra-trade:	$216 billion
Power Interconnection Investment:	$50 billion
Regional Transport Investment (road, rail):	$30 billion
ICT Infrastructure Development:	$60 billion

Planned Electricity Interconnections

Road Infrastructure development

Trilateral Free Trade Agreement (T-FTA)

Source: Frost & Sullivan Analysis

Connectivity will generate $200 Billion in opportunities for networked sectors by 2020

Seventy per cent of electrified households to use remote metering of electricity and automatic load staggering–$20 billion will be invested

ICT innovation will be a major employer of skilled manpower

Five per cent of cities will deploy intelligent transport systems for traffic management–$10 billion will be invested in these systems

One hundred per cent of terrestrial TV broadcasting will be digital–$4 billion worth of set-top-boxes to be sold

Forty per cent of hospitals will be networked with pharmacies and doctors–$40 billion will be spent on hospital ICT equipment

Ten per cent of urban office staff will work from home and use broadband networks

Seventy per cent of all banking transactions will use mobile technology–$300 billion to be transacted

Source: Frost & Sullivan, 2011

The challenges for African Governement

- Africa's broadband development strategy must ensure the adoption of national broadband plans and strategies by all markets
- Africa makes progress in optical fiber development; market has huge opportunity for growth
- Governments' strategies and plans in Africa's broadband development should align with ITU's vision for Africa's digital transformational agenda, which proposes a digital connectivity that is universal, affordable and of good quality
- African government increasingly adopts policies to accelerate broadband development

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Merci de votre attention

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