RES4MED
RENEWABLE ENERGY SOLUTIONS FOR THE MEDITERRANEAN

5th ANNIVERSARY of RES4MED

RES4MED ANNUAL CONFERENCE

Innovation as the key enabler to power Africa

Rome, May 22nd 2017

enel Green Power

Testimonial innovative projects in Africa

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Kenya Power

Utility Revenue Diversification through Fibre Optics-Case of Kenya Power

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RES4MED CONFERENCE, ROME, ITALY

Date 22nd May 2017

The Increasing Importance of Internet

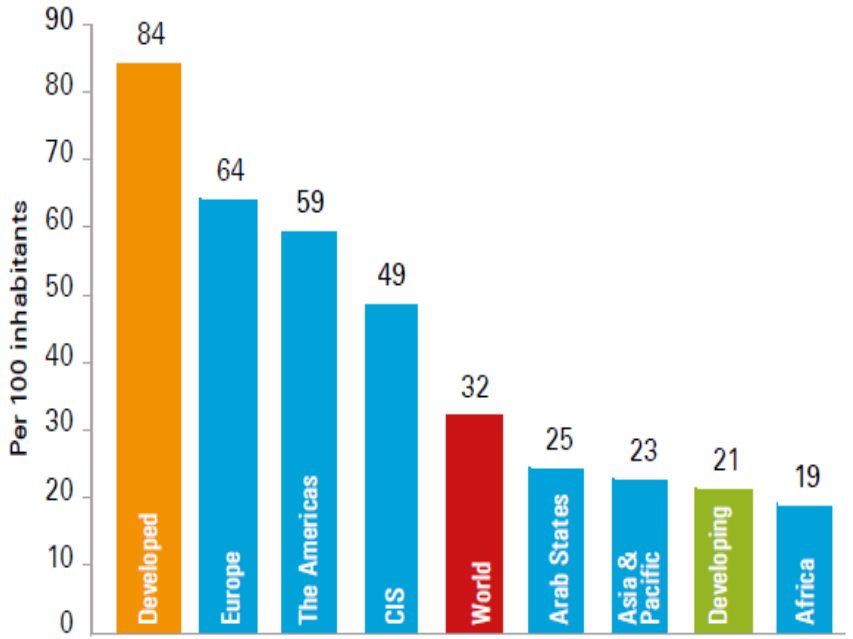
- Weather models available on the internet; information that is useful for local agriculture
- Internet based Telemedicine
- Internet based learning
- E-government
- E-procurement
- Video conferencing
- E-Commerce-Banking and Business outsourcing also viable as a consequence of broadband availability
- Online Banking
- Socialmedia, sms capabilities
- Broadband and innovative solutions

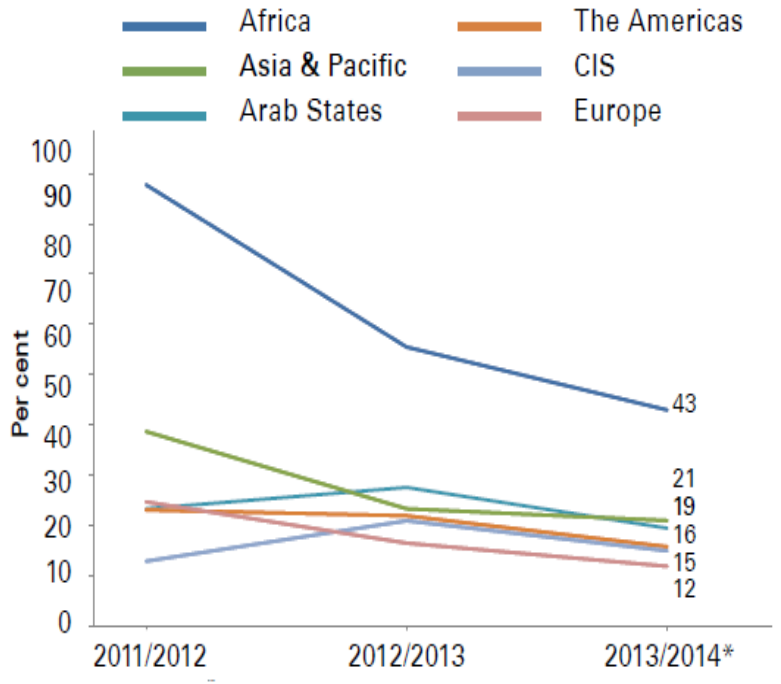
Broadband infrastructure is the foundation for the knowledge society and a well connected society can help solve some of the more pressing problems in Africa

The Reality of African Broadband

- Africa least broadband penetration at 19%
- Africa highest mobile broadband growth rate at 43%
- Developed countries are almost at saturation hence less penetration rate(s).

Figure 1: Active Mobile Broadband Subscription by Region, 2014 and Growth Rates 2011-2014

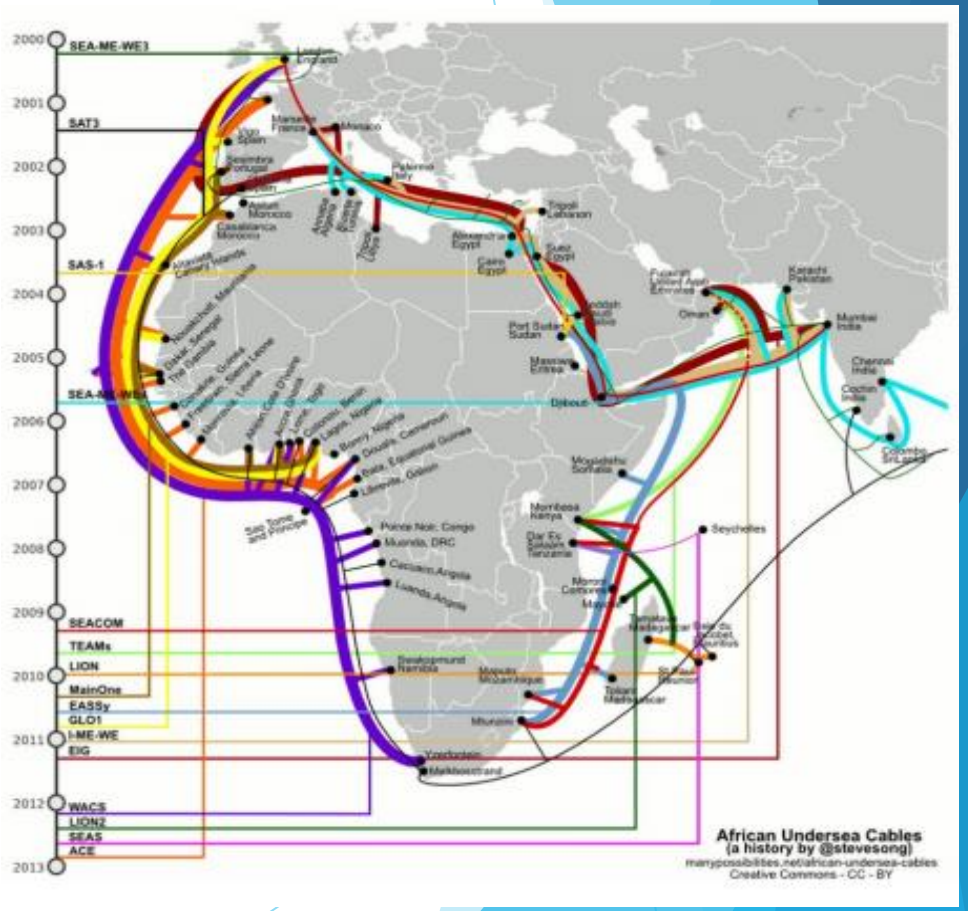




Note: * Estimate
Source: ITU World Telecommunication/ICT Indicators database

AFRICAN TELECOM INVESTMENT: PAST PRESENT AND FUTURE

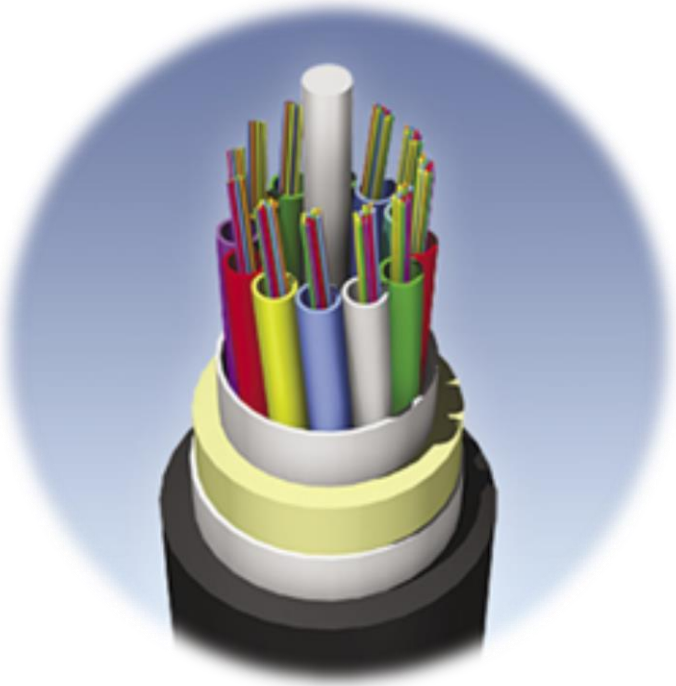
	Industry focus
1995 – 2005	• Gold rush for mobile licences and rapid mobile penetration growth in leading markets
2005 – 2010	• Extension of mobile with new operators, growth across the board and coverage extensions
2010 – 2015	• New submarine and regional overland cables provided huge new capacity all around coastal Africa • Mobile operator consolidation
2015 – 2025	• Upgrading and modernisation of mobile networks to support the shift to smartphones • Fibre broadband and fibre access is the major new emerging trend and will need major financing over the next few years



Source: Ventura Next

Applications , Bandwidth versus Technology trends

- Fiber is offering speeds beyond 100mbps upwards to 1Gbps and beyond in near future.



- Google Fiber USA – Offers speeds of 1Gbps up/down on Fiber.

Broadband consumer needs and technology options

End user's activities	Size, Gb	Bandwidth and time required per activity: 1 Mbps	10 Mbps	30 Mbps	100 Mbps
Graphical websites	0.001	4 sec	<1 sec	<1 sec	<1 sec
Music track	0.01	40 sec	4 sec	1 sec	<1 sec
Music album	0.10	13 min	1 min	27 sec	8 sec
250 photo	2.00	4.5 h	27 min	9 min	2.5 min
DVD movie	4.50	10 h	1 h	4.50	6 min
1h of personal HD video	12	27 h	2.5 h	53 min	16 min
HD movie	25	2.5 days	4.5 h	1.5 h	27 min
Full online backup	150	14 days	1.5 days	11 h	3.5 h

Most common technological choices

NOT acceptable quality

Mobile: 3G (UMTS) → 3.5 G → 4G (LTE) → 4G+ (LTE advanced)

Fixed: ADSL → VDSL → FTTC → FTTB → FTTH

Source: Based on Booz & Company, February 2012.

Note: 3G = third generation of mobile telecommunications technology; 4G = fourth generation of mobile telecommunications technology; ADSL = asymmetric digital subscriber line; DVD = digital video disk; FTTB = fiber-to-the-building; FTTC = fiber-to-the-cabinet, fiber-to-the-curb; FTTH = fiber-to-the-home; Gb = gigabit; h = hour; HD = high definition; LTE = long-term evolution; Mbps = megabits per second; min = minute; sec = second; UMTS = Universal Mobile Telecommunications System; VDSL = very-high-bit-rate digital subscriber line.

Comparison of Broadband System Capabilities

Fig 1: Broadband on Copper & Wireless

Source Wikimedia.org

Speeds **254Kbps >**

Fig 2: Broadband on Fiber Optic

Source Wikimedia.org

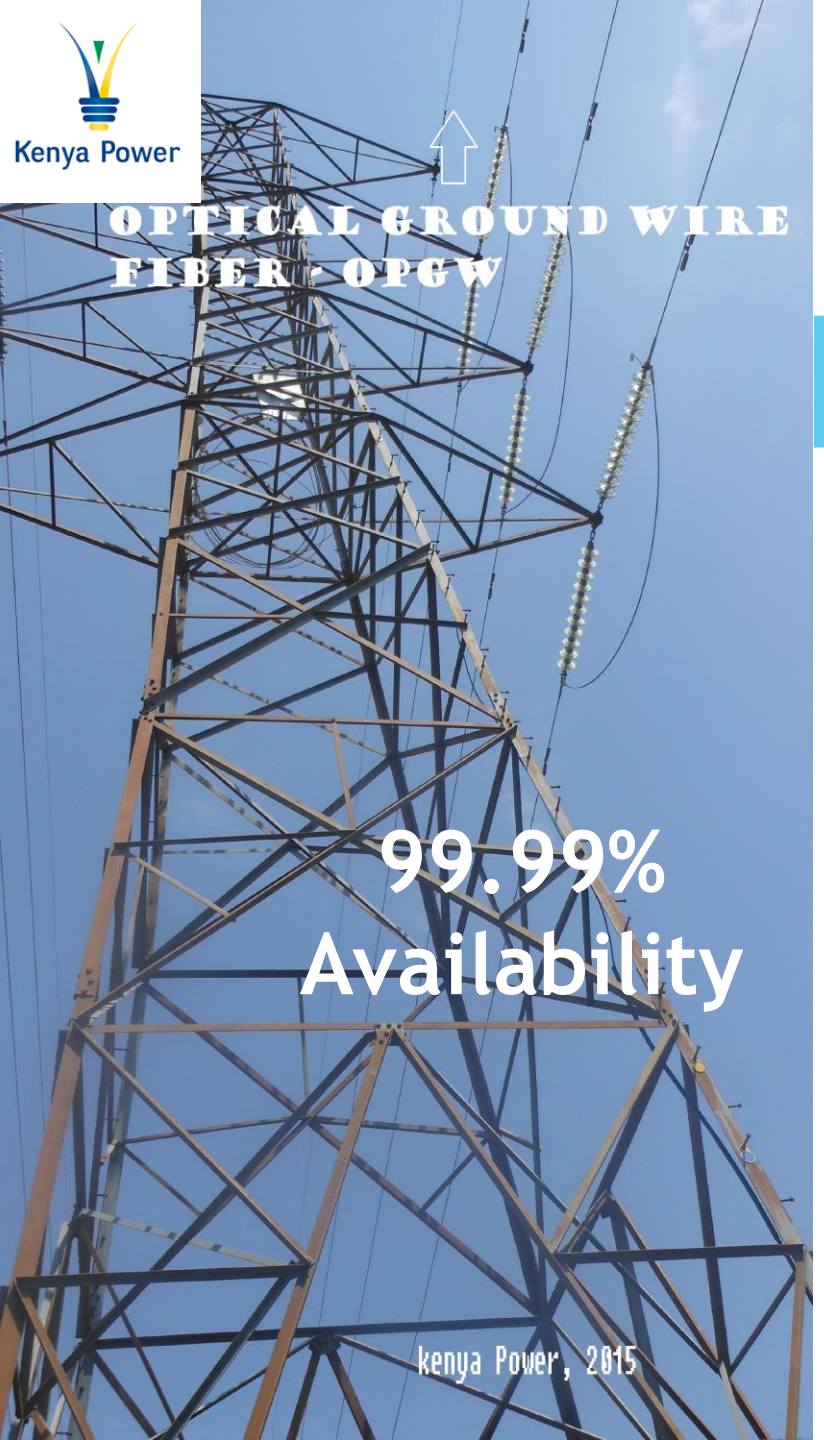
Speeds **100mbps, 1Gbps, 10Gbps & Above**

Fibre on Electricity Grid

- **Utility telecom concept concerns development of a telecom infrastructure that meets applicable regulatory and technological requirements for the support of the Utility core operation(s) and diversification to Telecom business.**

- **Electrical power distribution utilities use these telecom infrastructure comprising Fiber Optics, Microwave Radio Systems and Power line Carriers to ensure safety , Security and Control of the power equipment.**

- **The excess fibre capacity offers opportunity to generate additional revenues.**



Advantages of using Fiber Optics in Power Grids

Merits

- High Bandwidth
- Ease of Installation
- More infrastructure Security
- Low Cost of Deployment
- Electromagnetic Noise Immunity
- Lifespan
- Low cost of Operation & Maintenance
- High System Reliability
- Longer distances
- Multiple Signals
- Light Weight
- Low transmission loss
- Longer distances

Case: Kenya Power

Basic Statistics

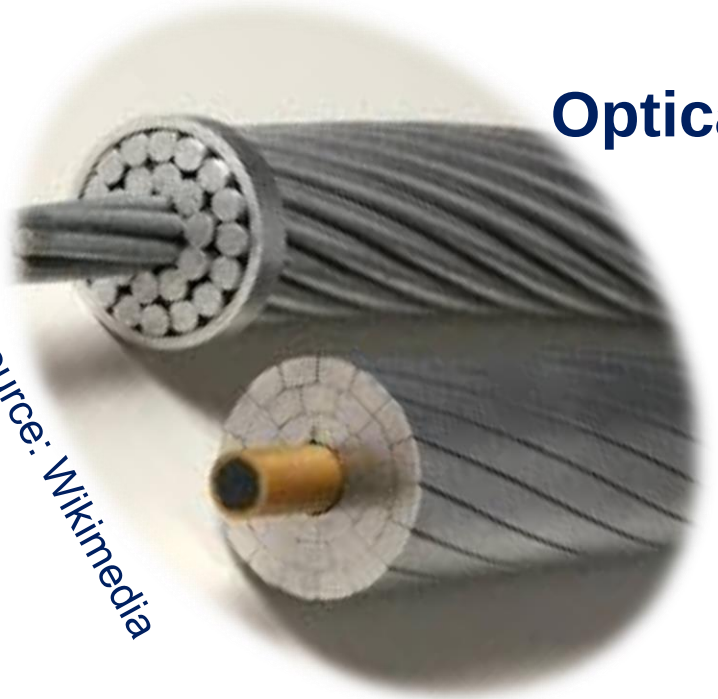
- Licensed , 2008 – Network Facility Provider License Tier II NFP-II
- Customers: ***Safaricom, Airtel, Jamii Ltd, Wananchi Telecom, Wananchi Group, Liquid Telecom , BCS Group, Frontier Optical Networks***
- Models –
  i. Lease Access, Backhaul dark fibers on USD/Km on 5,10, 15 or 20 year IRU.
  ii. SLA 99.99% OPGW, 98% ADSS
  iii. Colocation space lease 42U rack footprint & Telecom Shelter.
- One Terrestrial Gateway Kenya-Uganda Boarder Malaba.
- Coverage over 40 Counties

Revenue Trends

USD 1.5Million @2012

Over USD 2Million @ 2016

Status of Dark Fiber Development



Source: Wikimedia

Optical Ground Wire Cable (OPGW)

Approx. 1,800 Km

Source: Wikipedia

All Dielectric Self Supporting Cable (ADSS)

Approx. 2000 Km

Opportunities For Revenue Stream for Utilities

- Fiber to the Home (FTTH / x).
- Government Strategic Plan Initiatives 2014 -2017 & Vision 2030 Initiatives.
- (E-Governance, County Broadband , Rural Broadband Access, Last mile Power Connections,
- E-health & Education
- Fiber to LTE/ WiMAX
- Fiber in Traffic Surveillance , Mgt. & Carnage Control
- Colocation & Data Center Services

Strengths of a Typical Power Utility Provider

- ❑ Existing power utility infrastructure
- ❑ Experienced and trained manpower
- ❑ Expansive connectivity
- ❑ High network reliability
- ❑ No wayleave charges
- ❑ Low cost of installation

Conclusion

- Power utilities have an opportunity to provide reliable and low cost fibre by optimizing on transmission and distribution infrastructure
- Overhead fibre has proven to be more reliable as compared to underground especially in developing countries where infrastructure development
- Expansive connectivity can be realized within a relatively shorter time


End