# GHANA INFRASTRUCTURE SHARING PROJECT AND OPEN ACCESS STUDY

PUBLIC CONSULTATION WORKSHOP

Accra – 25th October 2016

A4AI ALLIANCE FOR AFFORDABLE INTERNET

# INTRODUCTION

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1
INTRODUCTION

# INTRODUCTION – THE PROJECT /THE TEAM

**MAGDA COCCO**
(VdA Partner)

**TIAGO BESSA**
(VdA Managing Associate)

**ISABEL ORNELAS**
(VdA Senior Associate)

**ELEANOR SARPONG**
(Project Consultant)

**The Project**

1. Analysis of relevant documents/information
2. Overview of Ghanaian market
3. Collection of stakeholder input
4. Inception Report
5. Public consultation on outcome of analysis and stakeholder input
6. Final Report

# 2 SETTING THE SCENE - CONCEPTS

# A. INFRASTRUCTURE SHARING CONCEPT


Infrastructure sharing is a form of resource sharing which may be carried out (i) between telecommunications operators and (ii) between telecommunications operators and other types of companies (cross-sector)

Infrastructure sharing types:

**Passive Infrastructure**

Tangible assets that are necessary to support active assets, such as masts, ducts, dark fibre or sites

**Active Infrastructure**

Assets used in transmission, reception or transformation of telecommunication signal (transmitters, receivers, antennas)

# B. SHARING MODELS


**Backbone Networks**

**Asset sharing**
An IBP accesses or interconnects its network to another national or international IBP Network

- **Peering**
- **Transit Payment**

**Mutualisation**
operators share one backbone network infrastructure; the operator of the infrastructure offers open and non-discriminatory access to all retail operators

# B. SHARING MODELS


| | |
|---|---|
| **Asset sharing** | RAN Sharing, Tower sharing, Site sharing |
| **Mutualisation** | Core network sharing, network outsourcing, national roaming, MVNO |


| | |
|---|---|
| **Line Sharing** | **Virtual unbundled local access** |
| **Full unbundling** | **Mutualisation** |

## Unbundling

Often refers to mandatory obligations for operators to share part of their network with other operators, although it is possible to construe it as an obligation towards network(s) sharing

## Spectrum Sharing

Regulating spectrum has become more significant in recent years, since its use, combined with being a scarce resource, brought a need for regulators to have a more relevant interference

This usually involves the use of same type of spectrum for various services or technologies

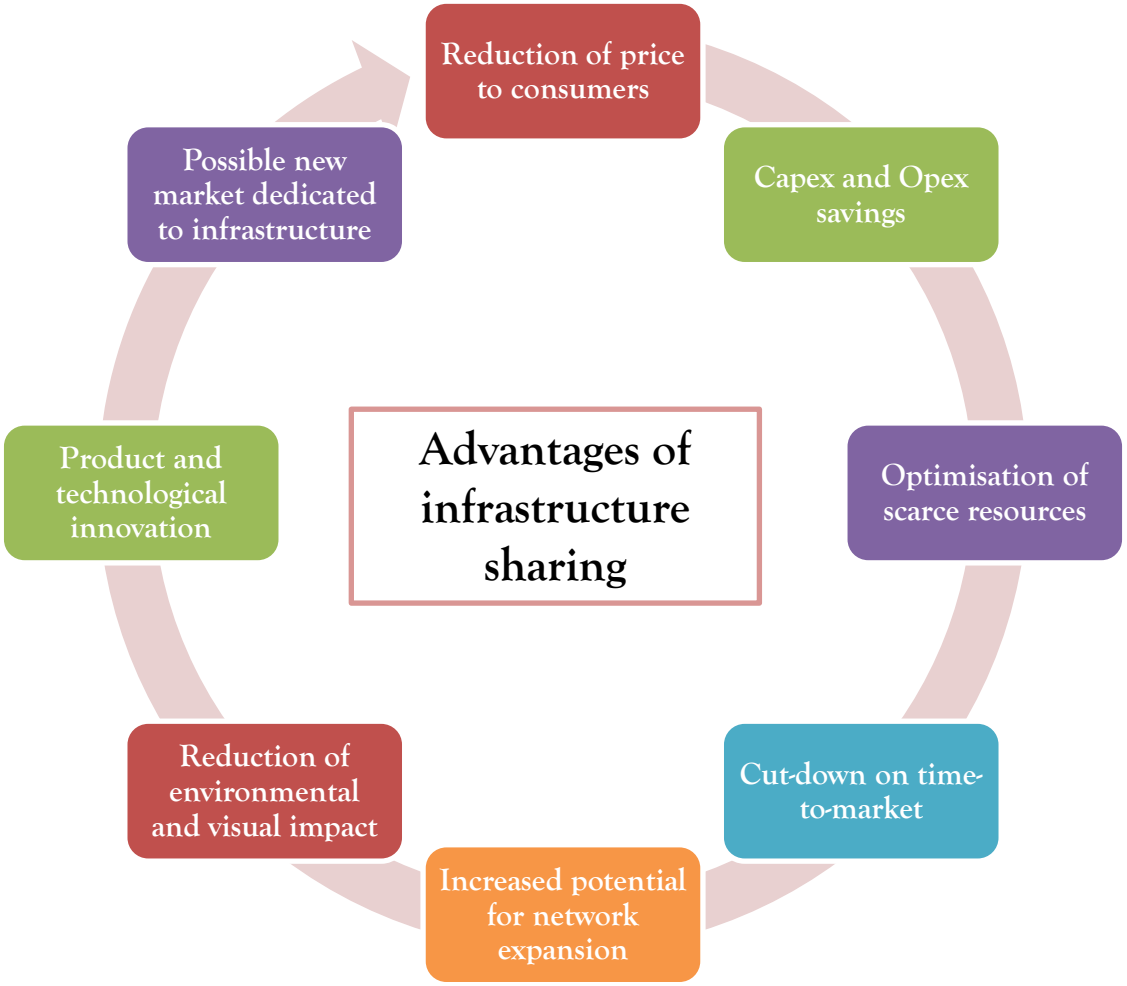
## Co-Location

Concerns the sharing of spaces in locations used for transmission, while each operator's equipment is completely independent and differentiated from other operator(s)' equipment, rather than the actual joint use of the infrastructure

## Interconnection

Facilitates operability between operator's networks. Mostly a way for operators to connect their networks, but can also work as a form of sharing networks (not physical infrastructure sharing)

# D. THE POTENTIAL OF INFRASTRUCTURE SHARING




| Disadvantages |
| --- |
| Possible abuse of position |
| Possible litigation between operators |
| Decreased incentive for investment in quality infrastructures |

# E. IMPORTANT FACTORS WHEN DESIGNING AN "INFRASTRUCTURE POLICY"


### Regulatory Options

Expectations on regulatory behaviour are essential to an operator's incentive towards infrastructure sharing

### Market Conditions

Depending on the areas at stake: rural or remote areas are typically not profitable for deployment., which encourages infrastructure sharing

### Competitive Structure

In emerging markets, operators compete based on coverage and passive infrastructure sharing tends to be more attractive

### Network Symmetry

Operators with similar roll-out cycles are typically incentivised to share their infrastructure, in order to ensure service-based competition

# E. IMPORTANT FACTORS WHEN DESIGNING AN "INFRASTRUCTURE POLICY"


### Mandatory Sharing

Regulators may impose infrastructure sharing – more likely when, for example, there is a need to expand broadband into non-profitable areas

### Price Regulation

Regulators may need to regulate prices – normally to bring consumer prices down. Infrastructure sharing allows for cost reduction and may avoid this need to regulate

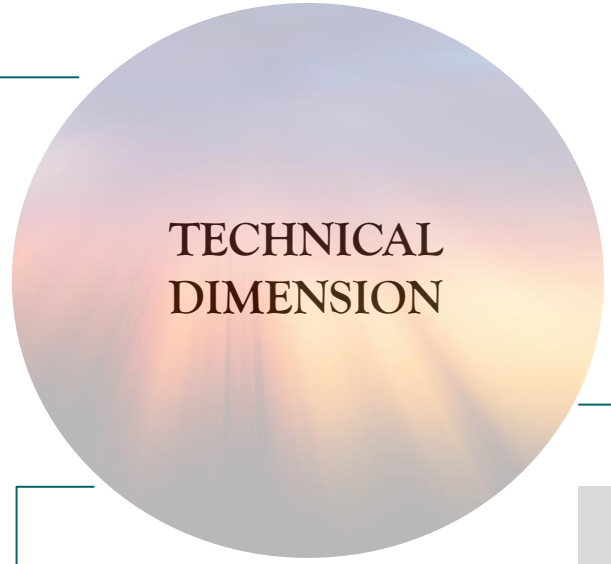
### Enable Sharing Agreements

Regulators can have a major role in enabling sharing and may result in operators having a bigger incentive for sharing

### Aid the development of shared infrastructures

For example, through PPPs or by direct state aid (namely, financial contributions)

# E. IMPORTANT FACTORS WHEN DESIGNING AN "INFRASTRUCTURE POLICY"




**Asset sharing strategy**

Regulations to incentivise or force sharing can encourage competition, reduce gaps between urban and remote areas and result in an environmentally-friendly solution

**Cooperation strategy**

Housing or jointly constructed linear infrastructures for *capex* and *opex* savings (utility service providers share rights of way with broadband operators or telecom operators sharing the same physical infrastructure)

**Mutualisation strategy**

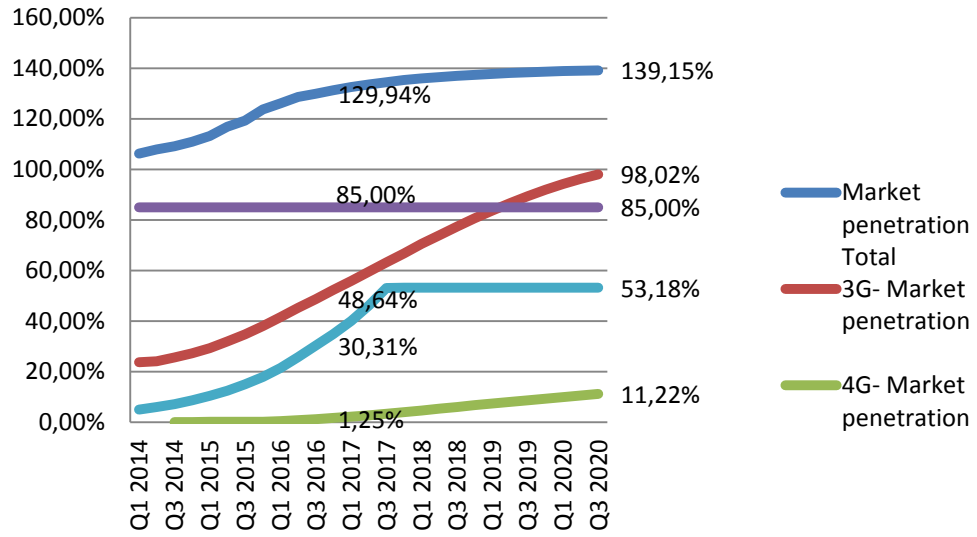
For example, through PPPs, with varying levels of intervention by each party (different sharing terms for ownership and risk). Typically, infrastructure providers operate at wholesale level, operators compete at a retail level

# 3 SETTING THE SCENE – OVERVIEW OF THE GHANAIAN MARKET STATUS

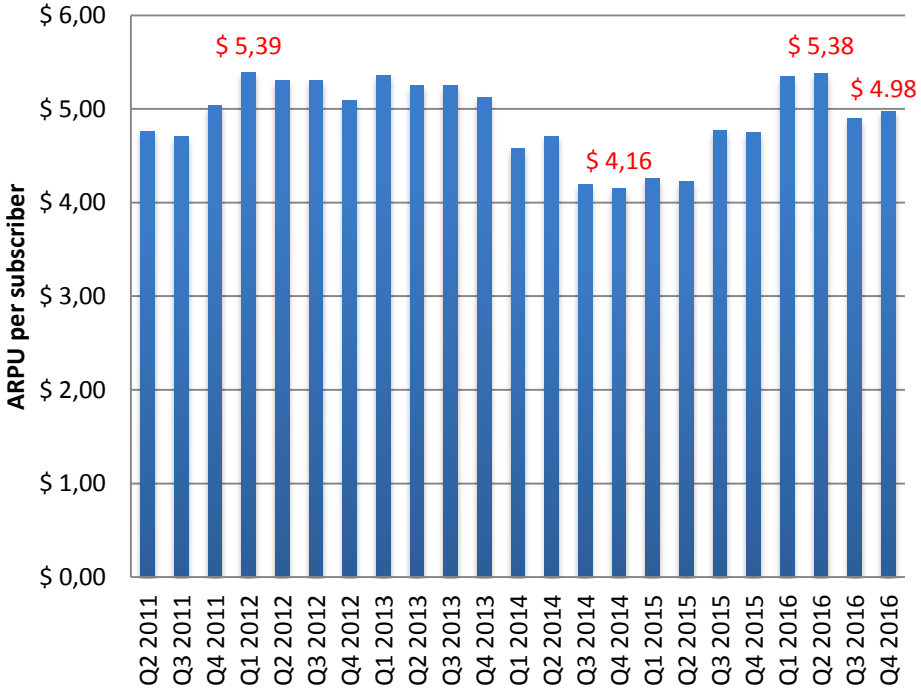
## Total fixed-line telephony subscriptions

| 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| 334 798 | 360 375 | 275 000 | 143 244 | 267 389 | 277 897 | 284 721 |

## 3G/4G Penetration

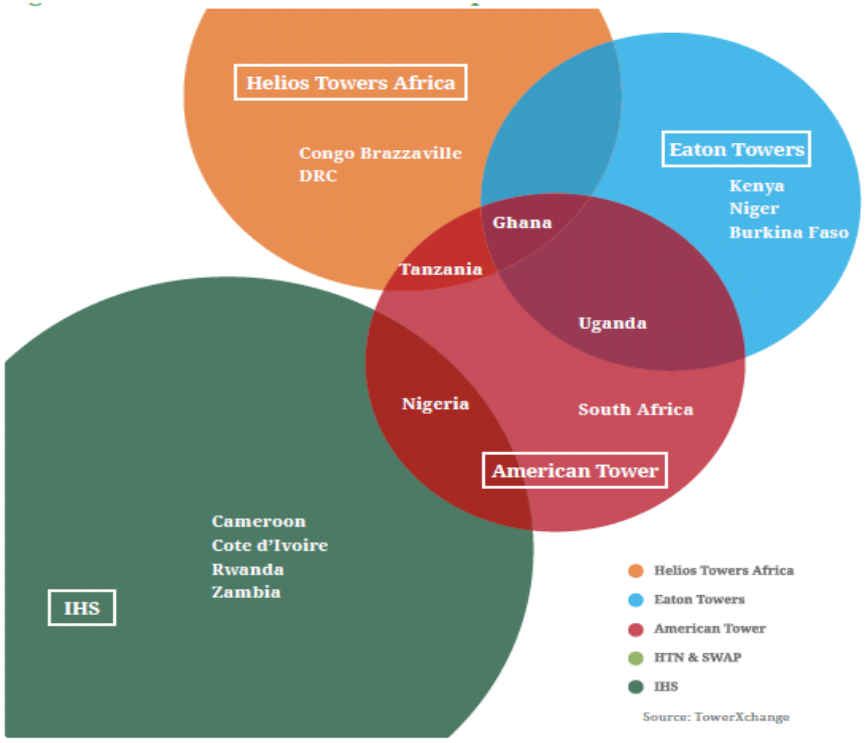



## ARPU per Subscriber for Ghana Mobile Market from 2011 - 2016

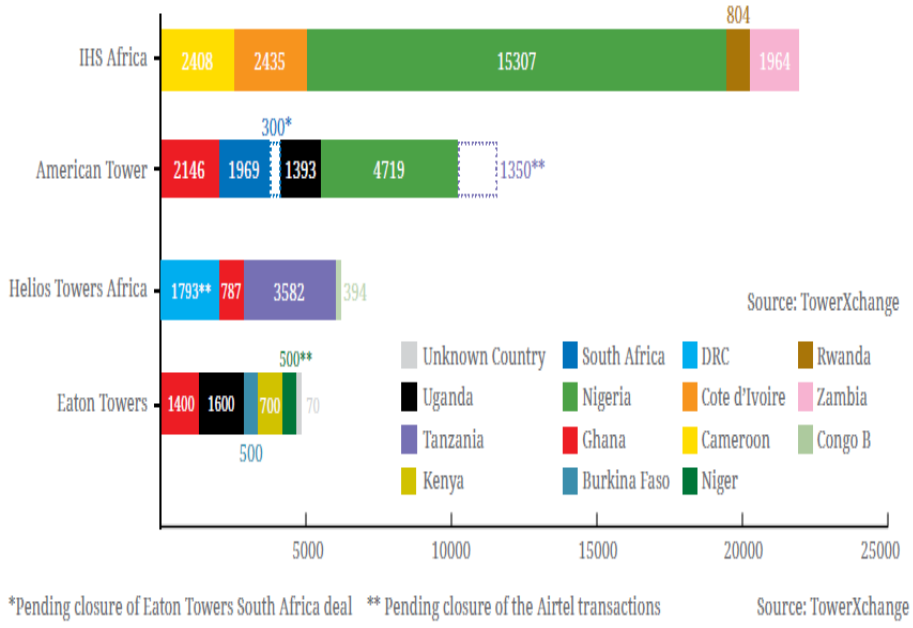


# A. THE TELECOMMUNICATIONS MARKET

Forecast African TowerCo footprints




Estimated number of towers owned or managed by TowerCos:

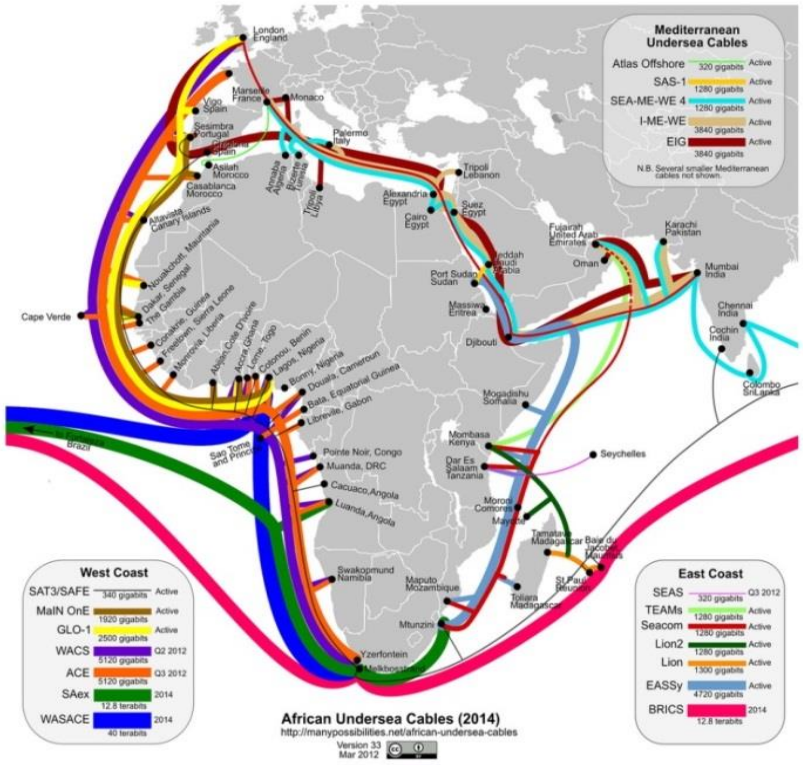



*Pending closure of Eaton Towers South Africa deal ** Pending closure of the Airtel transactions

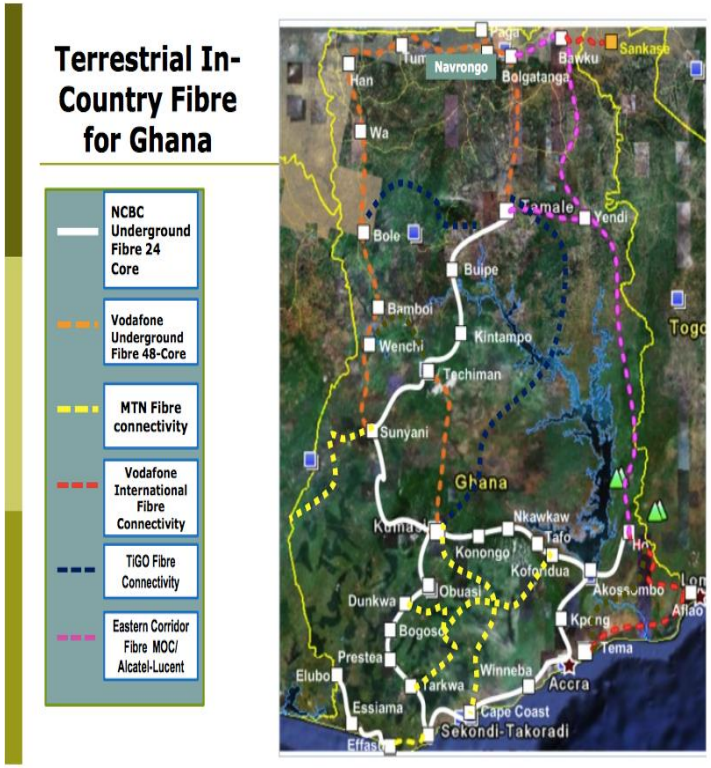
Source: TowerXchange

# A. THE TELECOMMUNICATIONS MARKET

Map of Africa Undersea Cables – 2014

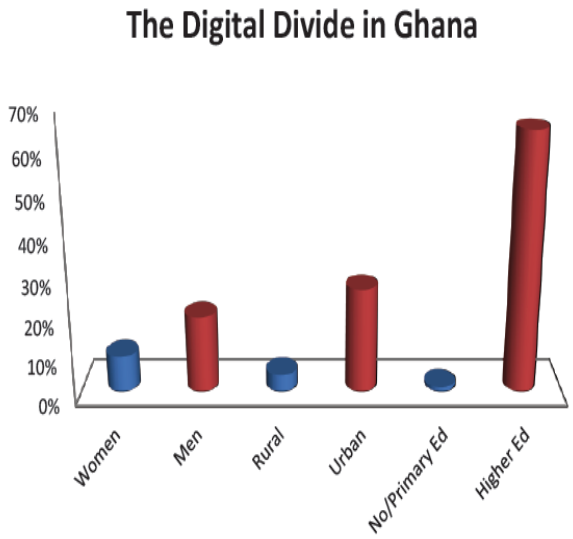



Terrestrial In-Country Fibre for Ghana



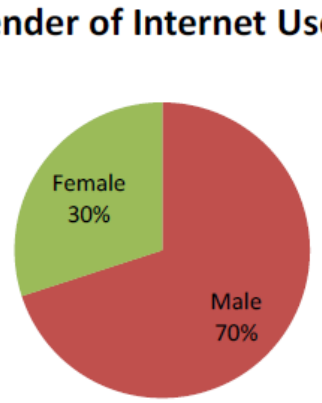

5 international submarine cables land in Ghana, although there is poor inland connection

# A. THE TELECOMMUNICATIONS MARKET

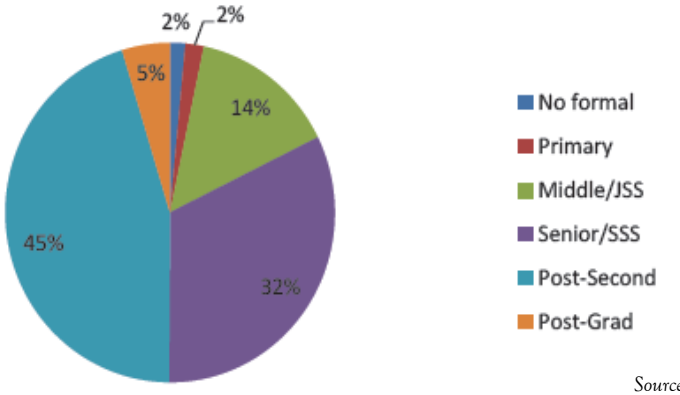



Typical ICT user in Ghana:

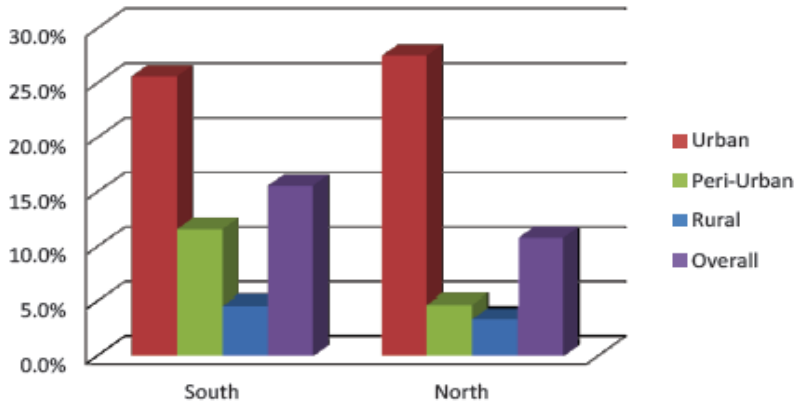
- Male
- 32 years old
- Professional or Government worker
- Lives in Accra
- Has a university education
- Uses mobile phone and 3G network to access the Internet
- Mainly uses Facebook, e-mail, and accesses on-line news sites




**Geographic allocation of internet users**




*Source:* USAID Report for GIFEC 2013



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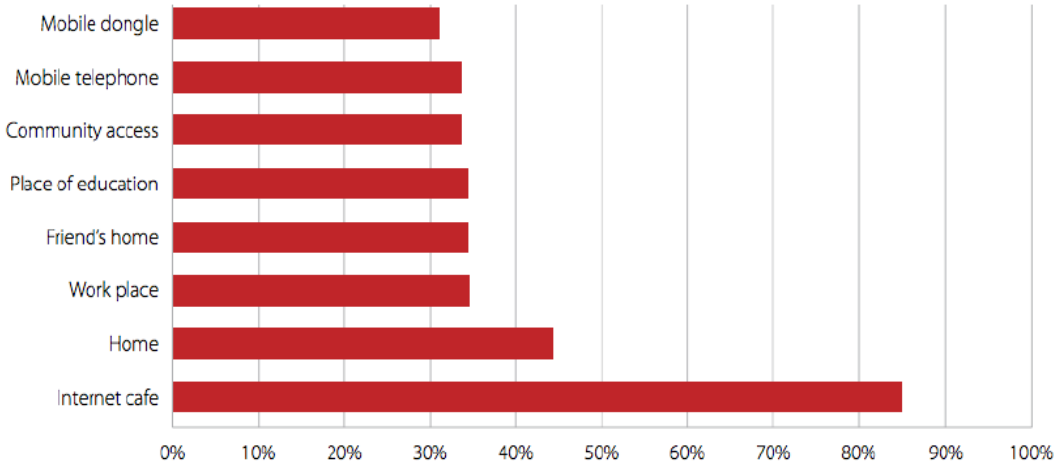
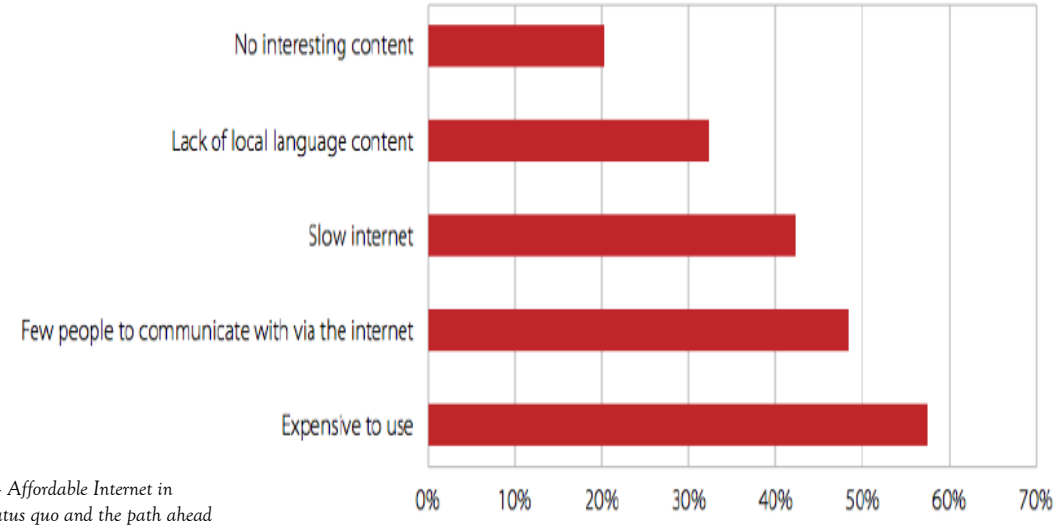



*Source: A4AI – Affordable Internet in Ghana: The status quo and the path ahead*

- According to the 2010 Ghana Census, only around 48% of the population owns a mobile phone. In rural areas, only around 30% dwellers do
- In rural areas, only 2% of population used internet
- Price of using internet was identified as the major obstacle for Ghanaians to access internet

# A. THE TELECOMMUNICATIONS MARKET

| Country | ITU Mobile broadband prepaid handset prices (500MB) (Rank) | ITU Mobile broadband prepaid handset prices (500MB) as % of GNI P.C. 2012 |
|---|---|---|
| Austria – First | 1 | 0.1 |
| India | 67 | 2.9 |
| Colombia | 85 | 5.8 |
| Kenya | 93 | 8.2 |
| **Ghana** | **96** | **9** |
| Tanzania | 98 | 11.3 |
| Nigeria | 99 | 13 |
| Uganda | 112 | 23.3 |
| Mozambique | 121 | 65.9 |
| S Tome & Principe – Last | 126 | 156.5 |

- Despite having a good mobile penetration rate (around 115%), unique subscriber penetration is estimated to be considerably lower (around 50%)
- High ITU Mobile broadband prepaid handset prices (500MB)
- The average call in Ghana cost around $0.02, which is the least expensive in Africa

*Source: A4AI – Affordable Internet in Ghana: The status quo and the path ahead*

# A. THE TELECOMMUNICATIONS MARKET

| Rank | Country | Sub-Index: Communications Infrastructure | Sub-Index: Access and Affordability | Affordability Drivers Index: Overall Composite Score |
|---|---|---|---|---|
| 1 | Morocco | 49.32 | 61.67 | 55.51 |
| 2 | Rwanda | 51.90 | 54.42 | 53.13 |
| 3 | Nigeria | 47.93 | 57.83 | 52.85 |
| 4 | Uganda | 42.44 | 56.53 | 49.40 |
| 5 | Gambia | 42.81 | 49.12 | 45.82 |
| 6 | Kenya | 39.27 | 52.00 | 45.48 |
| 7 | Viet Nam | 32.33 | 56.74 | 44.37 |
| 8 | Pakistan | 44.97 | 43.60 | 44.11 |
| 9 | Ghana | 38.92 | 47.15 | 42.84 |
| 10 | Myanmar | 53.67 | 31.88 | 42.57 |

*Source: A4AI – The 2015-16 Affordability Report*

- Ghana ranks 9th out of 30 in developing countries, with a total score of 42.84, in the Affordability index rank
- This rank took into account : (i) "*Communications Infrastructures*" - infrastructure deployment and existing policy and regulatory framework designed to incentivize and enable cost-effective investment in future infrastructure expansion (ii) "*Access and Affordability*" - price and adoption of broadband analyzing policy and regulations created to promote access and reduce service costs
- Ghana's ranks 14th in the "Communications Infrastructure" index and 9th in the "Access and Affordability" index

## International Policies

- (African Union General Orientations)
- ECOWAS General Orientations and Actions

## National Policies

## Legal and Regulatory Framework

## National Telecommunications Policy of Ghana - 2005

### Principles

- Fully open, private and competitive market for all telecommunications services
- Universal access for all communities to telephone and internet
- Interests of consumers in obtaining high quality, accessible and affordable telecommunications services

### Purposes

- To support the development of ICT industry, research, development and networking among stakeholders
- To promote confidence and security in the use of ICTs for national development

*"Access to public rights-of-way, towers, telephone poles, underground conducts, international cable landing stations, and other physical support structures will be shared among operators to the greatest extent possible"*

## Legal and Regulatory Framework

### The Electronic Communications Act (Act 755)

- "An operator shall give access to other operators who request access to the facilities or public rights of way or statutory wayleaves that it owns or controls on a timely basis"
- "A network operator or public utility may deny access to a facility or utility installation **only** where it demonstrates that the facility or utility installation has insufficient capacity (…)"
- "The owner of a shared facility shall be responsible for the maintenance of the facility and the responsibility for the connection and engineering of other occupiers equipment shall be by agreement of the parties"

- Operators must provide access to other operators that request access to facilities or public rights of way or statutory wayleaves that it owns or controls on a timely basis
- The National Communications Authority may intervene in resolving disputes or mediating negotiations and may regulate rates, terms and conditions for access
- Public utilities may also request the use of operator facilities (cross-sector sharing)

# B. POLICIES & LEGAL AND REGULATORY FRAMEWORK

## The Electronic Communications Regulations

**General Principles:**

- Universal access and service
- Non-discrimination
- Fair competition
- Security of public communications networks and services
- Priority of public over private communication services
- Development of the communications industry

## Guidelines for deployment of communication towers

Set out requirements:

- ✓ Administrative (timelines and documentation)
- ✓ Technical (set out by the competent authorities)
- ✓ Structural (landscape design, wind loading, insurance, expected lifetime)

## National Communications Authority Act (Act 769)

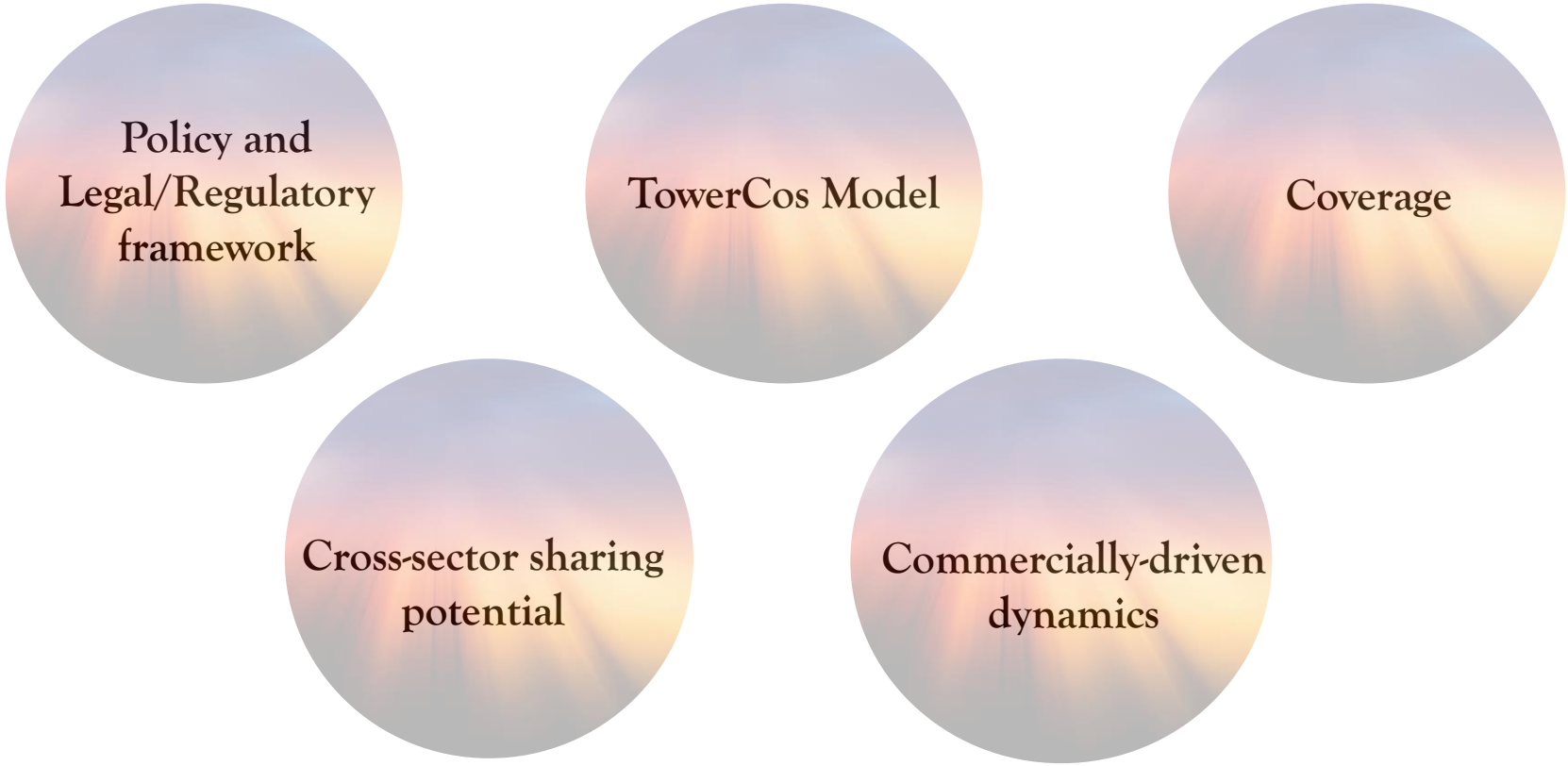
- NCA has powers to set out specific licensing procedures and provisions applicable to deployment and construction of infrastructure (Standard Infrastructure Communication Licence (Towers) and Guidelines for the deployment of communications towers)
- NCA to issue regulations which set out mandatory terms applicable to operators, for the purpose of ensuring interconnection and interoperation (the National Communications Regulations), with special attention to the National Communications Regulations

## Communications Infrastructure License

- Subject to the Guidelines for the Deployment of Communication Towers and prior notification to the NCA
- 10 years initial duration, renewable for another 10 years
- The licensee may establish and maintain the Communications Infrastructure facilities for lease, rental or sale to communications service operators

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING

The stakeholders' take on infrastructure sharing in Ghana



# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING

**Commercially-driven dynamics**

Infrastructure sharing is being carried out under a market-driven, business strategic approach

- Sharing essentially based on passive indoor/outdoor infrastructure (but active infrastructure sharing projects are also in place)
- Backbone sharing not attractive to operators, wasn't part of initial network deployment strategies. Feasibility studies may be carried out, but this is not a priority for operators
- Sharing takes place between other movers in the telecom industry (TowerCos, ISPs, most MNOs, GIFEC); and (ii) utilities providers (i.e. electricity grid), with most new towers being prepared for sharing

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING

**Commercially-driven dynamics**

Infrastructure sharing is being carried out under a market-driven, business strategic approach

- Sharing typically carried out in commercially attractive areas, in congested areas and wherever coverage is mandatory under licences

- Sharing not a trend for rural or remote areas which do not require mandatory coverage under licences, due to:
  - Lack of suitable telecom infrastructure and accesses for installation and construction
  - High capex for deployment
  - Low profitability (even with specific pricing models)

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


- Official coverage maps undergoing update and completion
- Asymmetries in coverage:
  - Concentration in urban areas in specific regions, due to reduced commercial feasibility
  - Coverage more extensive and intensive in southern region
  - District capitals covered, with rural/remote areas being underserved or unserved
  - Some areas are not profitable and are only covered to ensure regulatory compliance

Across the board, stakeholders are sensitive to coverage issue – authorities seek to encourage investment and service providers seek to find commercially attractive methods

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


- Current/planned projects:
  - **Fibre Optic Backbone Infrastructure Project**: (i) Eastern Corridor includes 800km serving major towns and 23 smaller communities; (ii) Western Corridor planned
  - **Fibre sharing** arrangements for capex-heavy areas
  - **Governmental policies and laws** to be revised
  - **GIFEC Rural Telephony Project** – GIFEC bears all capex. Purpose is establishing 200 rural telephony sites by end of 2016; providing access to telecom services in every community with at least 2,000 persons by December 2018

Capex Eliminated/Opex reduced (3,500$ to 300$/month)

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


- Most passive infrastructure (and its sharing) is managed by TowerCos on behalf of operators

- *Advantages*
  Market players happy with this model, as:
  - ➢ It ties naturally with tendency to share mostly passive infrastructure
  - ➢ Operators may focus on product development, marketing and tariff management
  - ➢ Eliminates trust issues in direct negotiations with other operators
- *Disadvantages*
  Pricing is an issue:
  - ➢ There is no clear, regularised pricing formula
  - ➢ Pricing is excessive, considering all operators' growth rate

**Sharing through TowerCo is preferrable, provided pricing is regulated**

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


- Some initiatives already in place between MNOs and utilities providers (positive feedback from operators, with potential and room to grow)

- Potential of mandatory cross-sector sharing capacity:
  - Reduction of costs
  - Convenient for congested areas or areas where deployment costs are too high
  - Existing barriers and bottlenecks may be addressed through regulation

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


Existing framework no longer adequate for Ghanaian market data current and future needs

- Operators find most initiatives to be supported by the market but not formally by policy, law or regulation:
  - National Telecommunications Policy dated 2005
  - Law and Guidelines may not fully address matters which have become important

- Some matters to be addressed:
- Pricing
- Incentives to investment in non-profitable areas
- Connectivity/content and fibre sharing arrangements (ISPs)
- Single set of technical standards for infrastructure
- Cross-sector obligations
- Transparency and dialogue

# C. HOW DIFFERENT STAKEHOLDERS APPROACH INFRASTRUCURE SHARING


Government initiatives

- Government has several projects in course/planned
  - Western Corridor for Fibre Optic Backbone Infrastructure Project (2017)
  - Turning over public assets to the private sector
  - Unified licence
  - Fibre mapping
  - Review of the National Telecommunications Policy
  - Preparation of Policy specifically for infrastructure sharing

# Market needs in Ghana

# D. MARKET NEEDS IN GHANA

**Access**

(Increasing general population access to ICTs)

**Connectivity/Fibre**

(ensuring access to fibre backbones and submarine landing stations)

**Coverage**

(reducing digital divide between urban and rural areas/national roaming)

**Dialogue between stakeholders**

(operator operation data and legal/regulatory action)

**Streamlining infrastructure sharing**

(eliminating timing, pricing, equipment quality issues)

**Gap in regulation**

(dialogue, pricing, one-stop-shop, regulatory bottlenecks)

**Broadband**

(bringing down broadband data prices for final consumers)

**Current Needs**

# D. MARKET NEEDS IN GHANA

| | | | |
|---|---|---|---|
| **Capitalising on extended Fibre Network**<br><br>(planned Western Corridor) | **Market-driven infrastructure sharing options**<br><br>(i.e. active infrastructure) | **Regulatory monitoring and enforcement**<br><br>(universal licences and evolving market dynamics) | **Optimisation of existing infrastructure**<br><br>(expansion without construction) |
| **Licence renovation terms**<br><br>(2019 licence renovations) | **Enforcement** | **Spectrum auctions**<br><br>(possible ancillary infrastructure sharing obligation) | **Backbone sharing**<br><br>(international practice for 4G/5G roll-out for efficiency gain and cost reduction) |

**Future Needs**

# 4 BENCHMARK & TRENDS

# 4. BENCHMARK & TRENDS

| Country | Types of sharing | Powers of the regulator | Principles |
|---|---|---|---|
| **Angola** | Passive sharing. Active sharing may come to be regulated, under a different regulation | May intervene in the case of unreasonable refuse to share, to impose sharing or to act as a mediator | Free negotiation, equality, non-discrimination, good faith, efficiency and transparency and, whenever possible, alternation between operators |
| **Mozambique** | Passive sharing | Has powers to intervene in cases of litigation and to apply the Law and regulations in regards to telecommunications, monitoring activities, attributing sanctions and establishing tariffs in the context of universal service access | Access should be provided on a non-discriminatory, transparent and reasonable basis and costs should be equitably distributed among operators |
| **Nigeria** | Passive sharing | May intervene in the event of a refusal to share or act as mediator in the absence of an agreement | "First come, first served" approach |
| **South Africa** | Passive sharing | Holds the authority to issue codes of conduct regarding consumer protection. It may also intervene to settle disputes and issue regulations regarding technical matters and establish charges and fees | Agreements are to be made on non-discriminatory basis |

## Mutualisation of the National Backbone

- **Rwanda** investing on expansion of backbone network, to add to existing 2500 km of fibre optic national backbone
- Rwanda's government will deploy a mutualised mobile broadband access network which will cover up to 95% of total population that utilizes Long-Term Evolution (LTE) technology
- Rwanda adopted a joint venture mechanism: the infrastructure is owned by the government, who provides the private partner an equity stake in the joint venture, national backbone assets, licenses for use of spectrum and the right to sell the access network capacity at a wholesale price for 25 years

## Cross-Sector/ Information

- In **Portugal**, operators, internet providers and other entities are forced to share infrastructure on a non-discriminatory, transparent and equal conditions basis
- A Centralized Information System, containing a record of those entities infrastructures, forces them to share these infrastructures, under certain conditions, and forbids the exclusive use of these infrastructures by a single operator

## Backbone Implementation Network

- In **India**, the IBIN seeks to promote capability in India in order to promote better coordination among agencies and stakeholders (stakeholder alignment, project management, and policy development processes)
- Studies before April 2013 showed that the poor relation/coordination between the telecommunication players was a big reason for poor policy implementation in the country

# 5 PRELIMINARY RECOMMENDATIONS & NEXT STEPS

# 5. PRELIMINARY RECOMMENDATIONS & NEXT STEPS

## Policy Level

- Revision of current National TeleCommunications Policy
- New Infrastructure Sharing Policy
- New Broadband Policy

## Legal Level

- Additional cross-sector sharing obligations
- Coordination between different legal instruments
- Legal principles on active/passive sharing, possible models
- New Licensing templates

## Regulatory Level

- Price regulation
- Enforcement Actions
- Stakeholder dialogue
- Technical standards uniformisation
- One-stop-shop
- Backbone sharing

**Next steps?**

# Thank you!

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