How Supportive Regulations can Help Loosen the Backbone Bottlenecks

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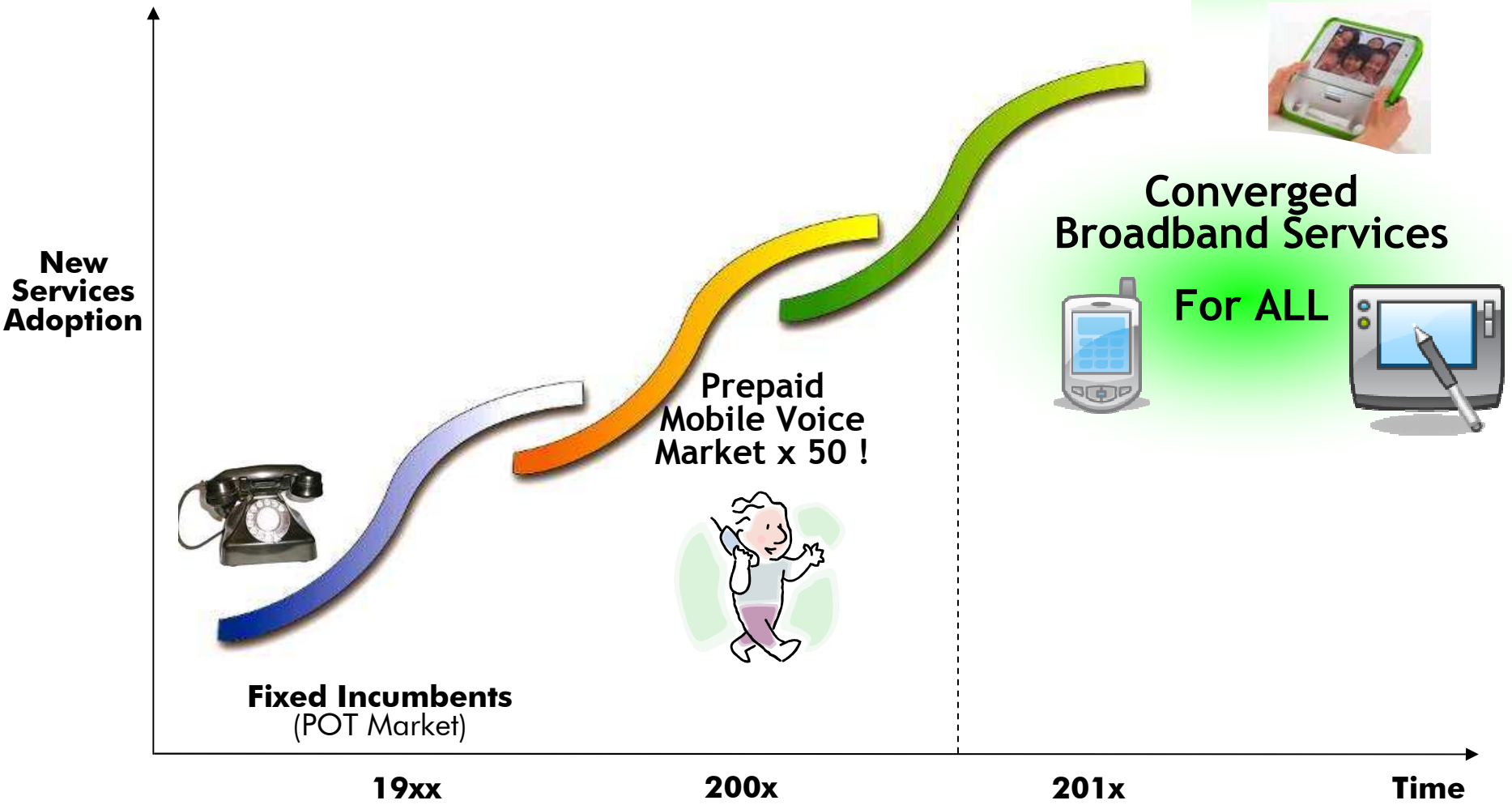
Africa Telecom Market

Be prepared to surf the Next Wave

1B people across Africa await Broadband Internet



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A demanding market reality for network providers…

Video and content rich services are booming…

Affordable broadband, proliferation of smart devices, multiplicity of multimedia/video applications

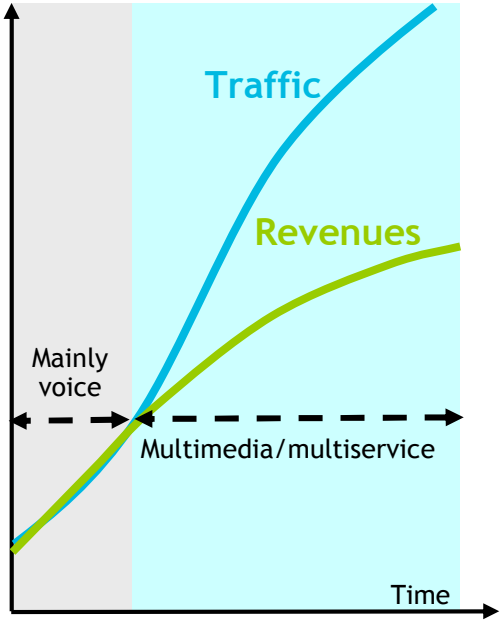
… but users expect more…

Simple, personalized access and interaction, across any device, any network, anytime, anywhere

… and access to 3rd party apps and content

Paid for by advertisers, free to end-users – network providers extract limited value

Cost Challenge



Requires a change from keeping value *in* the network to extracting value *from* the network

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Broadband Boost in AME

3G* Connections & Penetration by Region, 2007 – 2014E

(All connection numbers in 000s)	2007	2008	2009E	2010E	2011E	2012E	2013E	2014E
Middle East & Africa	5,781	18,424	50,409	91,085	165,564	239,805	309,251	383,238
3G Penetration	*1%*	*3%*	*7%*	*12%*	*19%*	*25%*	*30%*	*35%*

Morgan Stanley

Note: Regions ranked by 2008 absolute numbers of 3G connections. 3G technologies include WCDMA, HSPA, TD-SCDMA, 1xEV-DO, LTE and WiMax. Source: Ovum, Morgan Stanley Research.*

54

And Average Bandwidth per user to grow from 10 kbps to 50kbps by 2014

Means Backbone capacity to grow from 53Gbps to 3.5 Tbps*

+185% CAGR

* Source: ALU MEA SSD Market Development Plan Ed. 2009

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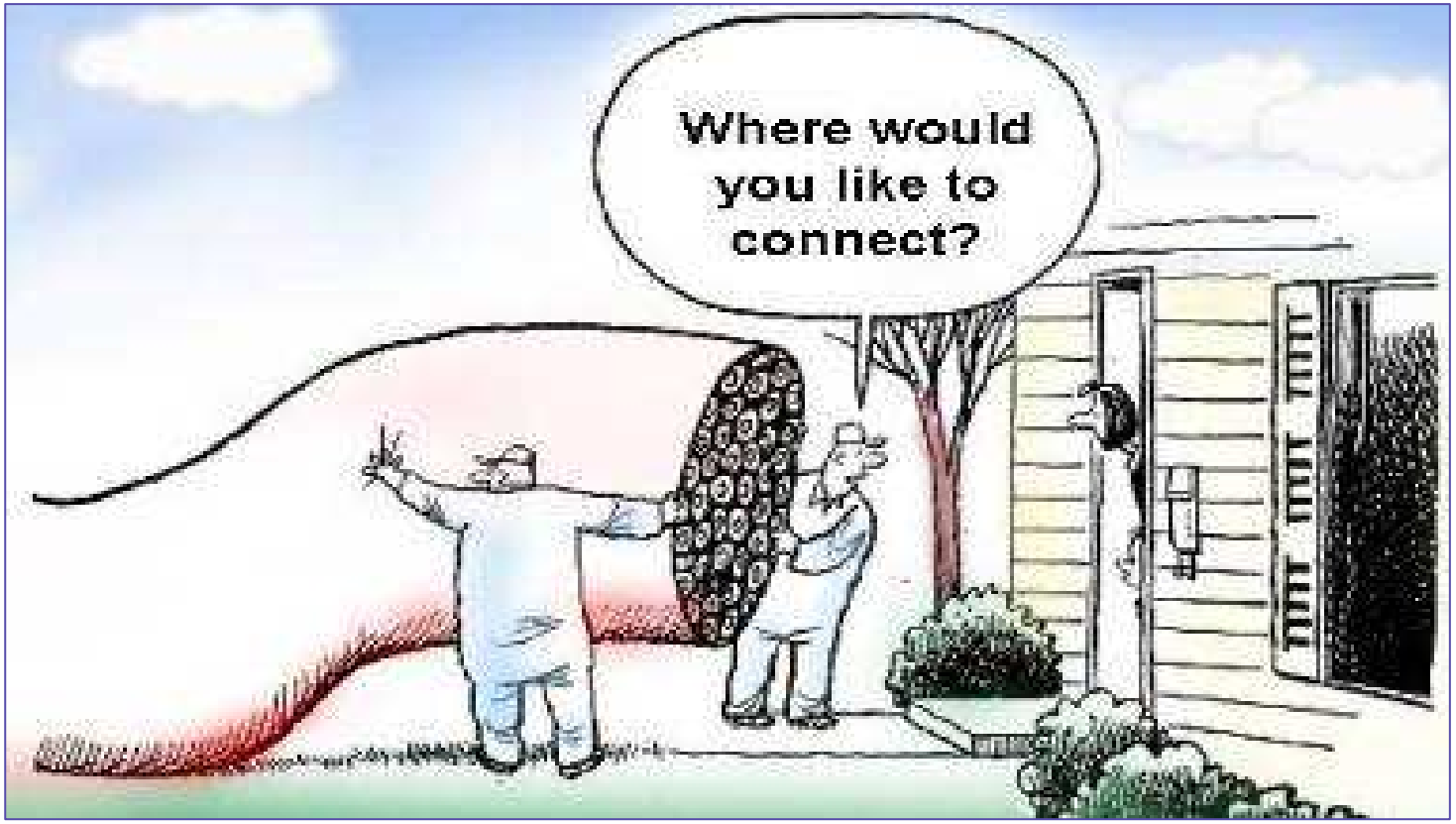
Opportunity: Build the missing the **"DRY PIPES"** links



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Mass Market Broadband Business Cases fly only where International Bandwidth is cheap

Today => Satellite or Monopolistic Backbone

High International gateway costs ($3000-$6000 /Mb/s/month) → **High ARPU mandatory ($100-$200 /month)** → **< 10 M Broadband subs in Africa + Low take-up rates**

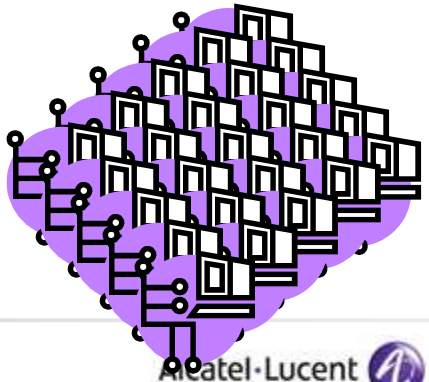
Tomorrow => Competitive* International Cable Backbones

Reduced International gateway prices

⇒**Heading $500 /Mb/s/month**

⇒**Aiming at $65-$150 /Mb/s/month**

→ **Profitable Bus Cases With Low ARPU subscribers ($8-$30 /month)** → **Stimulates Broadband take-up rates 100M+ subs?**



* "Competitive": where several FO cables compete for the same market

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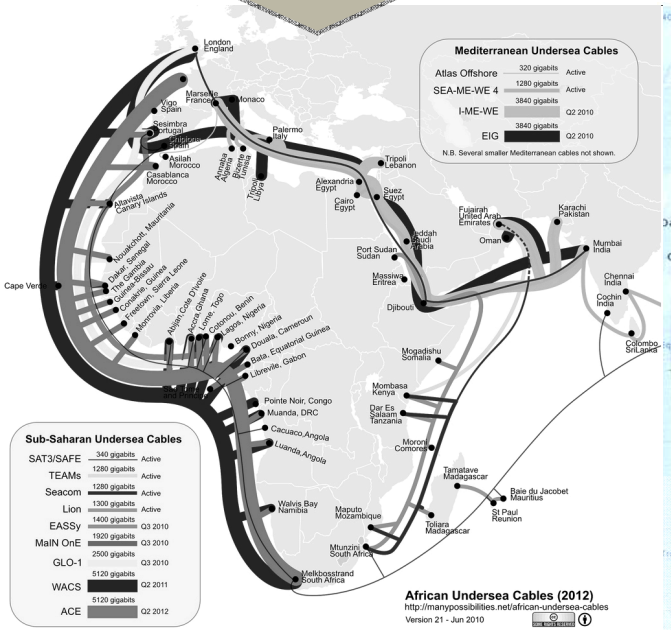
Opportunity: Build the missing the **"DRY PIPES"** links

INTERCONTINENTAL + **CONTINENTAL & NATIONAL** + ***BROADBAND ACCESS***

☑ ***Wet Pipes*** ☐ **Dry Pipes to build !!!** ☐ ***Still a lot to build*** *(mainly in 3G/LTE)*



- *RSA (2007)*
- *Morocco*
- *Nigeria (2009)*
- *Ghana (2010)*
- *Tunisia (2010)*
- *Mali (2010)*
- *Ivory Coast (2010)*
- *…*

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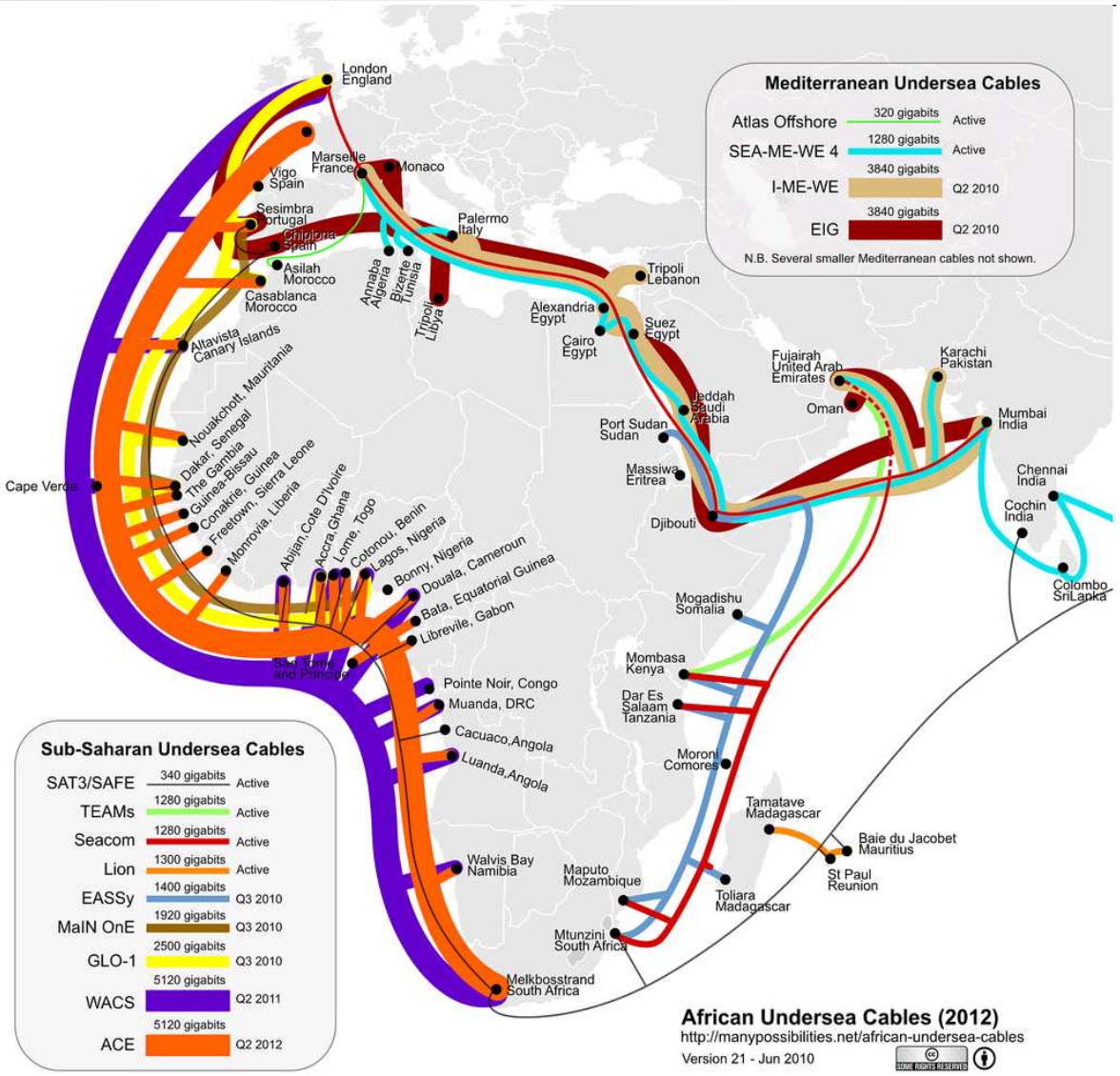
Unlimited Capacity on the Sea Shore
… do not "supply" the Hinterland

☑ Wet Pipes are landing

⑩ International bandwidth x 1000

- From 10 Gbps in 2008
  Thru Satellite + 1 submarine cable
- To 20+ Tbps = 20 000 Gbps
  Thru 9+ competitive
  submarine cables in 2012

And All Telcos do not have equal access to the resource everywhere



INTERNATIONAL WET PIPES
Who does what by when?

	GLO1	WACS	MainOne	ACE	EASSy	TEAMs	Seacom
Cost (M U$D)	150	600	240	700	265	130	650
Length (km)	9,500	14,000	7,000	14,000	10,000	4,500	13,700
Capacity	2.5 Tb/s?	5.12 Tb/s	1.92 Tb/s	5.12 Tb/s	1.4 Tb/s	120 Gb/s – 1.28 Tb/s	1.28 Tb/s
Completion	Q2 2010	Q3 2011	Q2 2010	Q2 2012	June 2010	Sept 2009	July 2009
Ownership	Globacom	Telkom Vodacom MTN Tata (Neotel) Infraco OCPT …	US Nigeria, AFDB	France Telecom + Baharicom ? OCPT ? + other Telcos	African Telcos 90% Inc. WIOCC (SPV to facilitate Open Access)	TEAMs (Kenya) 85% Etisalaat (UAE) 15%	USA 25% SA 50% Kenya 25%
Provider							

Other: **SAT-3 / SAFE** (African incumbents) and **LION** (FT-Orange) also made by Alcatel·Lucent

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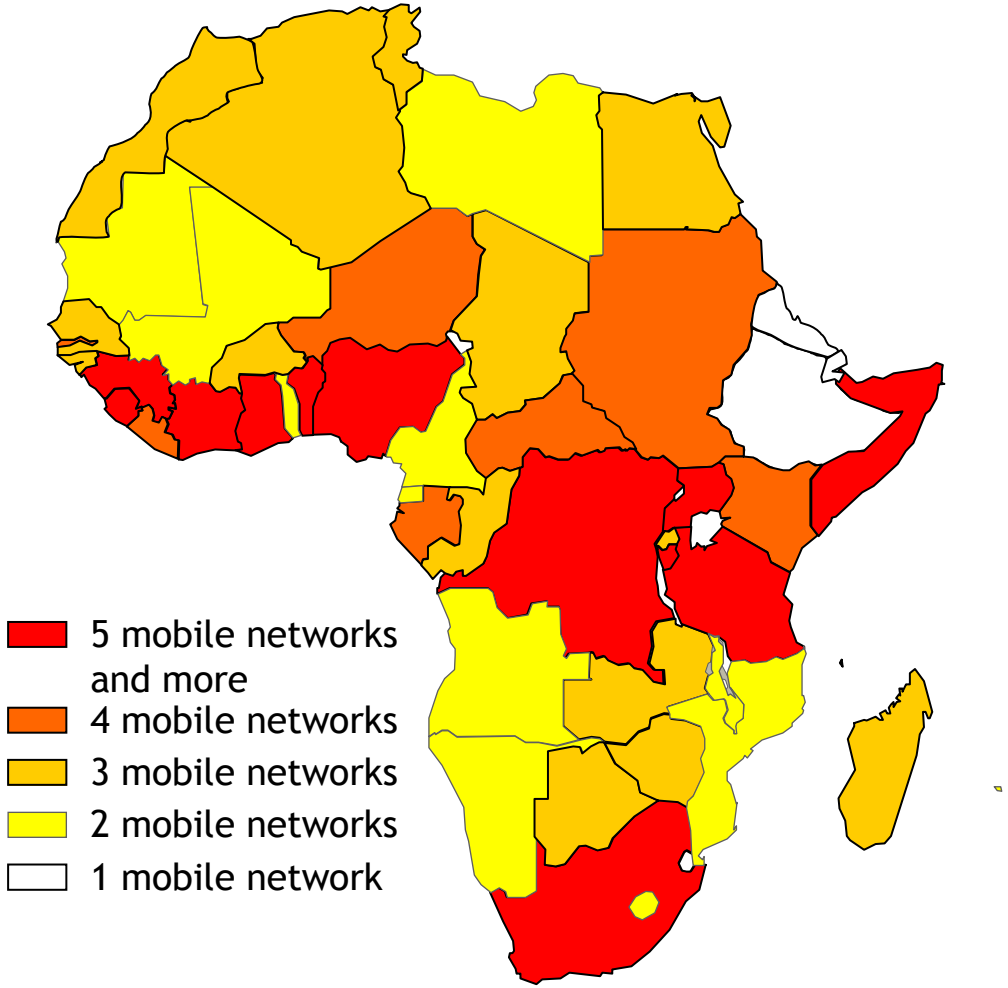
Global Players Set the Pace and Have Deep Pockets

=> Specific Focus on **8 Telecom Groups** (= 80% of African Market)



55 Countries

8 Strategic Mobile Investors in Africa

As of 2009	*Number of Countries*	*Subscriptions (million)*
MTN	21	116
Airtel / Zain	15	42
Vodafone / Vodacom	8	68
Orascom	7	27
FT / Orange	15	23
Millicom	6	12
Etisalat	10	11
Vivendi / MT	5	17

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Who to invest in “Dry Backbones” in Africa

The **Top Biggest 8 Mobile Groups (=80% of African Market)**

They have the will, the financing power, the wet pipes, and some have started interconnecting some affiliates… where authorized by regulations.

Main **Infrastructure** Players

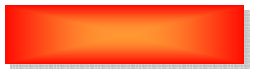
Follow Projects along Pipelines, Railways, Power grids…

Public Authorities and incumbents

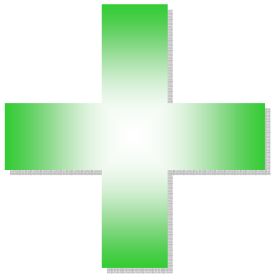
They should do it. But they often no longer have the Financing Power required.

Lessons learned from Africa

Regulations can either Hamper or Help Loosen the Backbone Bottlenecks



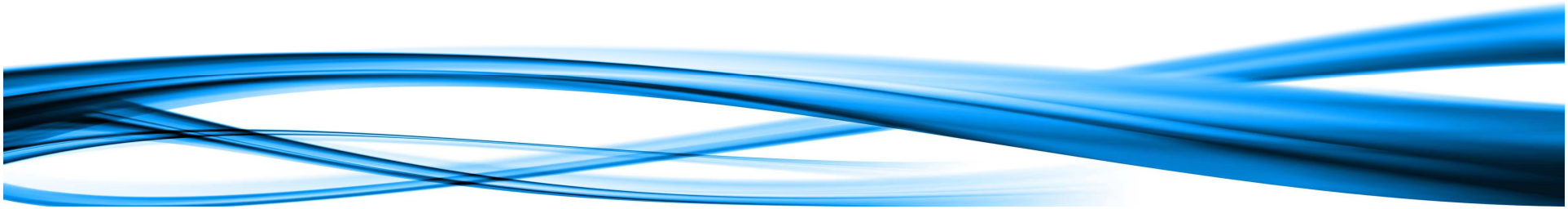
- Some countries nurture a "Transmission Monopoly"
- Difficulties to resolve "Right of Ways" issues
- A "de facto" single resource is always a limiting factor (e.g. single submarine landing point, landlocked country dependent on a single neighboring country)



- Harmonize regulations at regional level to facilitate cross-border connections
- "Global Licences" encourage multiple competitive deployments
- "Open Access" policy (nice but difficult to implement)
- Facilitate cooperation between multiple second league players
  - PPP
  - "Terrestrial Consortia"
  - Emergence of Competitive "Carriers of Carriers"

Alcatel Lucent and Backbones in Africa

- ALU builds 80% of Submarine Backbones connecting Africa
- Experience in Terrestrial Optical Backbones including operational support in pan-African roll-outs
- Lays more than 10.000 km per year
- Operates Throughout Middle-East and Africa with All Major Telcos



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