

ITU Regional Regulatory and Economic Dialogue (RED) for Africa

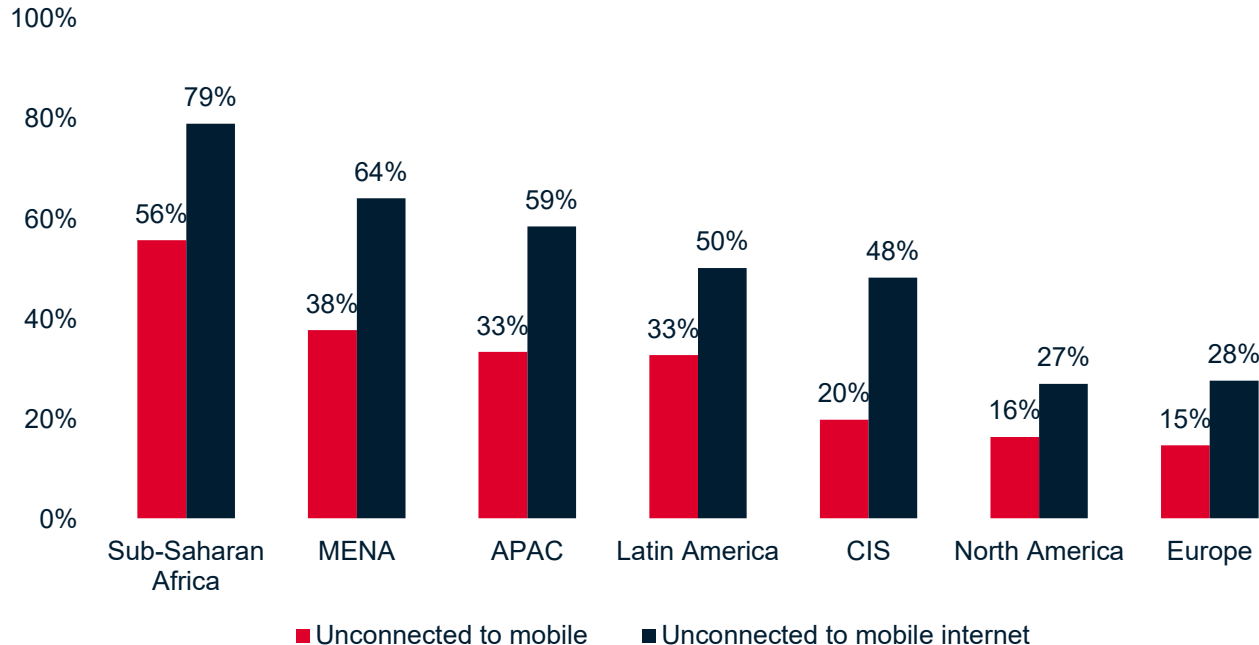
# Spectrum Pricing in Developing Countries

09/10/2018

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# Digital Divide

Unconnected Population (2017)



- 2.6 billion people do not use mobile
- 4.3 billion people are not connected to the internet
- **90% of the unconnected are in developing countries**

# Policy Objectives for Spectrum Pricing

## CONSUMER WELFARE

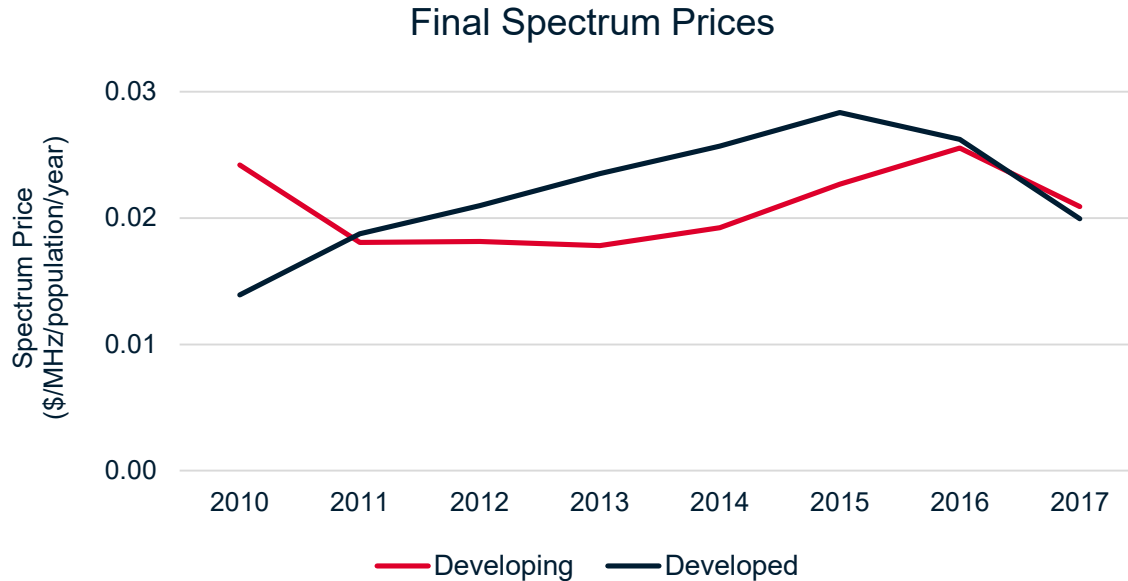
Spectrum is allocated to maximise consumer welfare in mobile markets

## PUBLIC REVENUE

Raise public funds using the least distortionary method

- Many Governments prioritise revenue maximisation
- This can have a **negative impact on consumers** and the wider economy if it slows mobile development

# Similar prices to developed countries

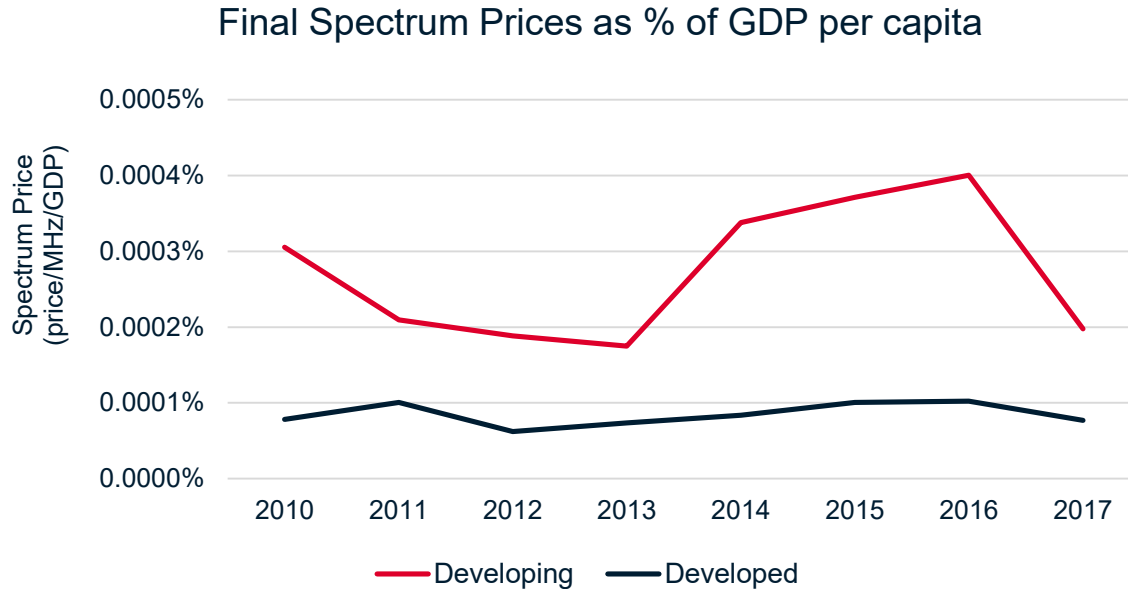


- Prices in developing countries similar to developed countries in recent years
- A unit of spectrum therefore costs the same (in \$PPP)

Source: GSMA Intelligence.

Spectrum prices have been adjusted by inflation, PPP (2016 prices) and licence duration and aggregated by country, band, generation and assignment. All spectrum bands for which relevant data was available are included. Outliers have been excluded from the analysis. The analysis is based on 3-year moving averages.

# More expensive when income is considered



- When income is factored in, spectrum prices in developing countries have been **three times higher** than developed markets

Source: GSMA Intelligence.

Spectrum prices in local currency (by MHz/pop/year) have been adjusted by inflation, GDP per capita and licence duration and aggregated by country, band, generation and assignment. All spectrum bands for which relevant data was available are included. Outliers have been excluded. The analysis is based on 3-year moving averages.

# What is driving higher spectrum prices?



Demand and willingness to pay (market factors)

## But also spectrum policy...



Very high (reserve) prices



Limited supply of spectrum

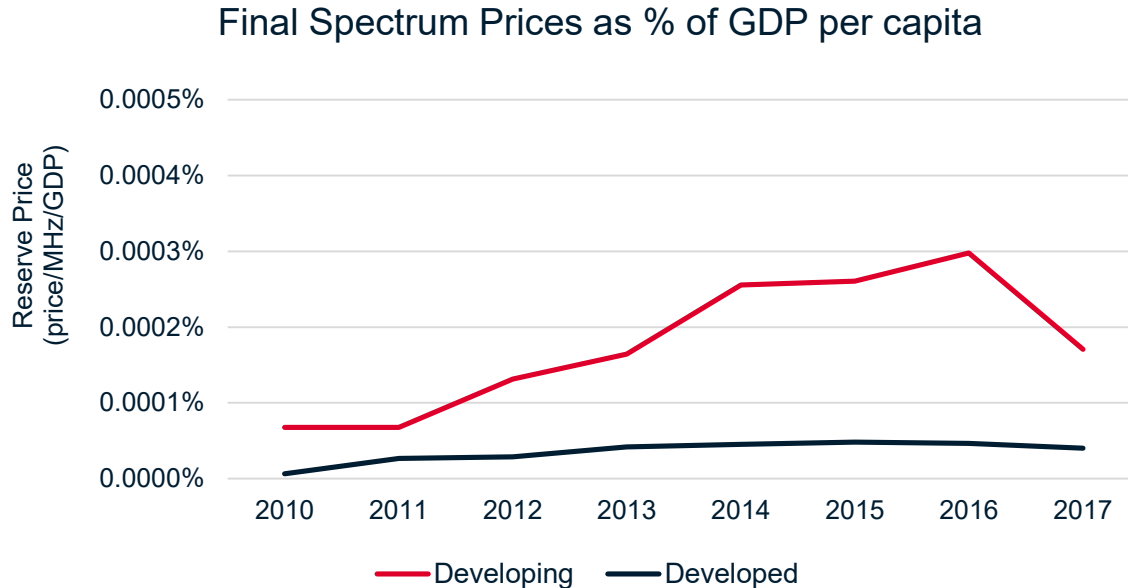


Not publishing a spectrum roadmap



Poor award rules (such as auction formats)

# Reserve prices set aggressively

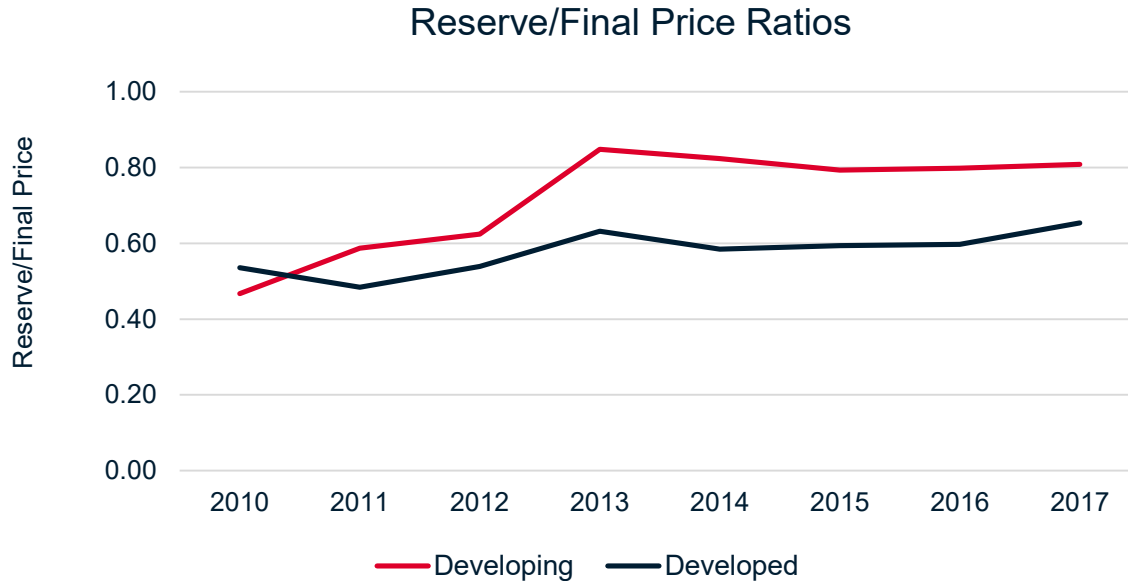


- Average reserve prices in developing countries doubled between 2010 and 2017
- When income is factored in, reserve prices in developing countries have been **five times higher** than developed markets

Source: GSMA Intelligence.

Spectrum prices in local currency (by MHz/pop/year) have been adjusted by inflation, GDP per capita and licence duration and aggregated by country, band, generation and assignment. All spectrum bands for which relevant data was available are included. Outliers have been excluded. The analysis is based on 3-year moving averages.

# Final prices close to reserve prices



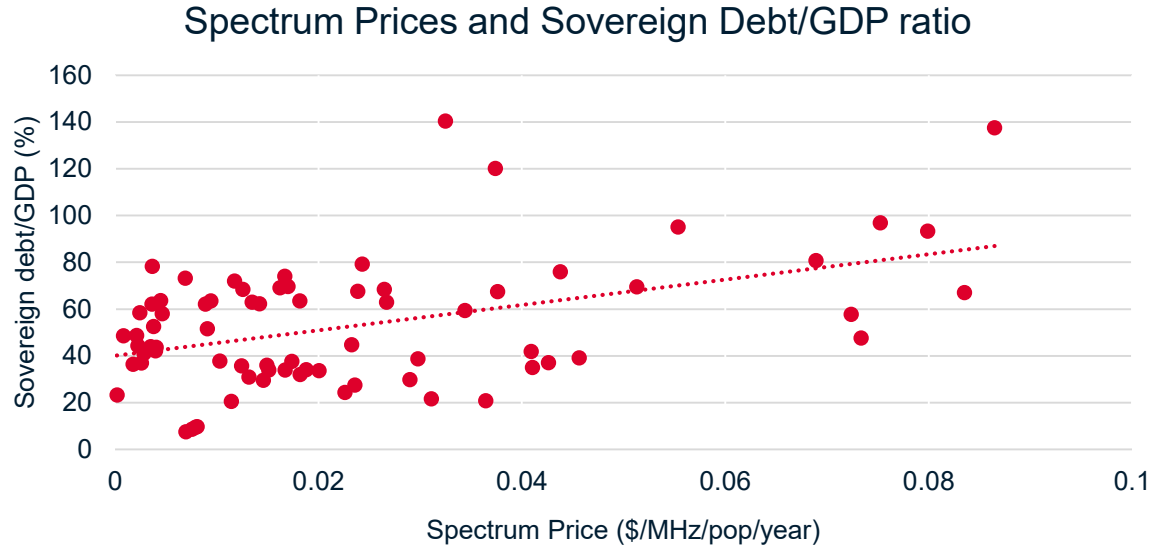
- Reserve prices capture most of the willingness to pay
- Little room to set market prices

Source: GSMA Intelligence.

Spectrum prices have been adjusted by inflation, PPP (2016 prices) and licence duration and aggregated by country, band, generation and assignment. All spectrum bands for which relevant data was available are included. Outliers have been excluded from the analysis. The analysis is based on 3-year moving averages.



# High prices linked to high sovereign debt



- Relationship does not hold to same extent in developed countries
- Link is particularly strong with high **short-term** debts

Source: GSMA Intelligence and World Bank.

Spectrum prices have been adjusted by inflation, PPP (2016 prices) and licence duration and aggregated by country, band, generation and assignment. All spectrum bands for which relevant data was available are included. Outliers have been excluded from the analysis. The analysis is based on 3-year moving averages.

## Why does this matter?



Affects operator investment and pricing decisions



Creates uncertainty for long-term investment horizons

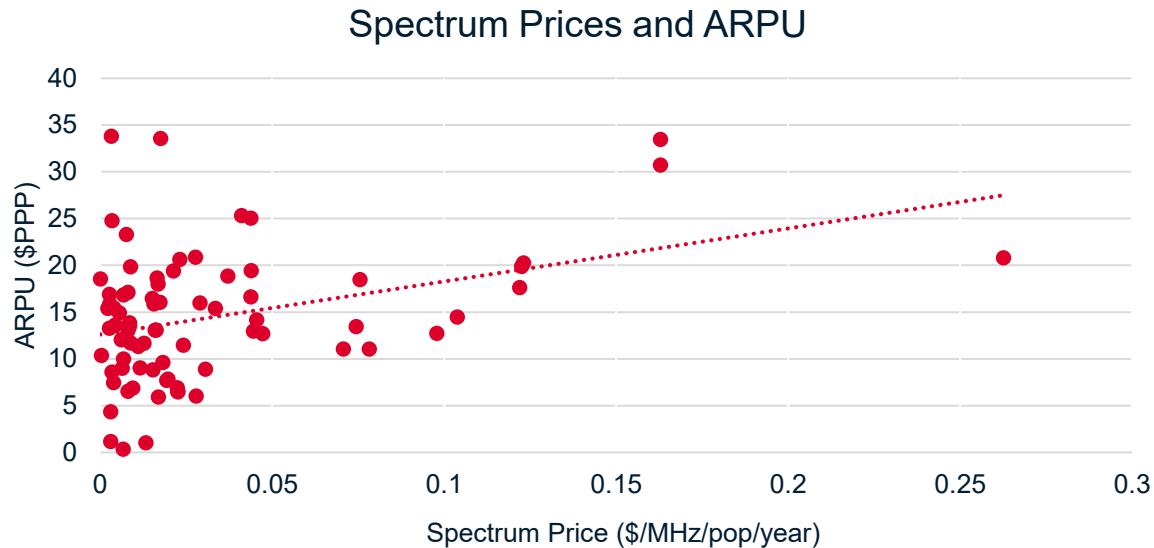


Can impose financing constraints



Or does spectrum represent a sunk cost?

# High prices linked to more expensive services

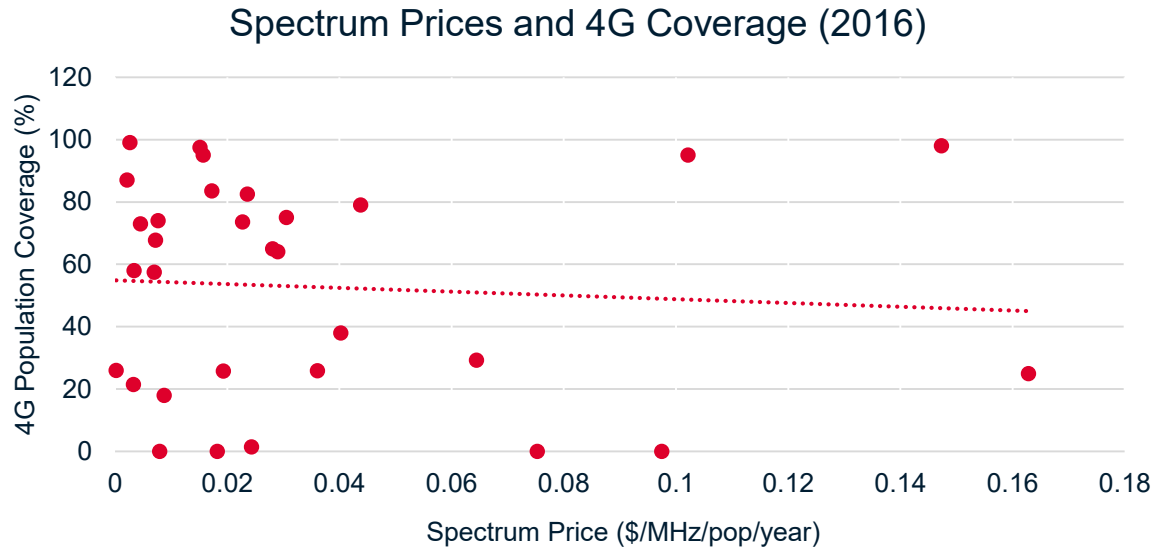


- High spectrum prices linked to high consumer prices (using ARPU and also tariffs)
- Relationship stronger for lower usage baskets

Source: GSMA Intelligence and World Bank.

Spectrum prices have been aggregated by operator over the period 2010-2016, adjusted for inflation, PPP (2016 prices) and licence duration. Only countries with a comprehensive set of pricing data between 2010 and 2016 were included in this analysis. ARPU has been adjusted for inflation and PPP (2016) prices.

# ...and lower 4G coverage

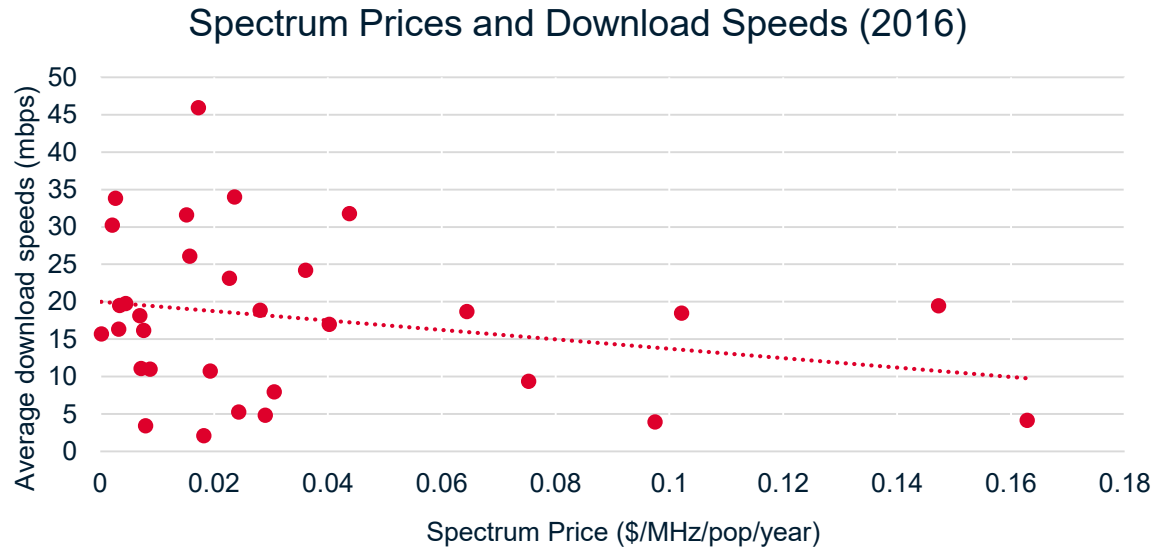


- High spectrum prices linked to lower 4G coverage
- Very high prices can also lead to unsold spectrum (impacting coverage)

Source: GSMA Intelligence and World Bank.

Spectrum prices have been aggregated by operator over the period 2010-2016, adjusted for inflation, PPP (2016 prices) and licence duration. Only countries with a comprehensive set of pricing data between 2010 and 2016 were included in this analysis.

# ...and lower network quality



- High spectrum prices linked to lower download speeds
- Similar relationship with upload speeds

Source: GSMA Intelligence, World Bank and Ookla

Spectrum prices have been aggregated by operator over the period 2010-2016, adjusted for inflation, PPP (2016 prices) and licence duration. Only countries with a comprehensive set of pricing data between 2010 and 2016 were included in this analysis.

## Conclusions on high spectrum prices



Not just driven by demand and market factors



Short-term public finance considerations are driving some Governments to prioritise revenue maximisation



This has repercussions for consumers and businesses



Poorer coverage



More expensive services



Slower speeds

# Policy recommendations for effective pricing



Rely on market to set prices - reasonable reserve prices and annual fees



License spectrum as soon as it is needed and avoid artificial scarcity



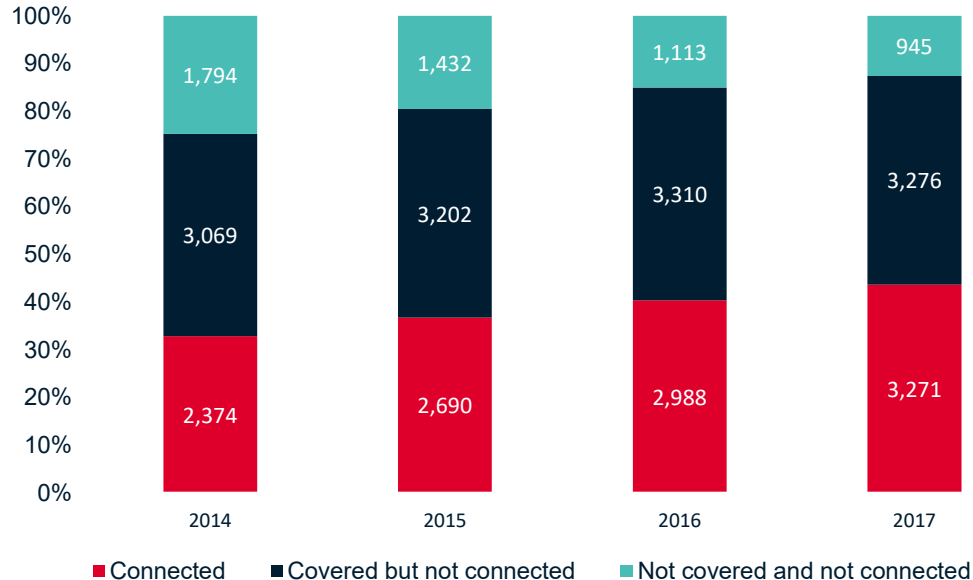
Avoid measures that increase risks for operators



Publish long-term spectrum award plans that prioritise welfare benefits over public revenues

# Coverage Gap vs Usage Gap

Connected and Unconnected Population (millions)



**Coverage Gap** - 1 billion are not covered by mobile broadband networks

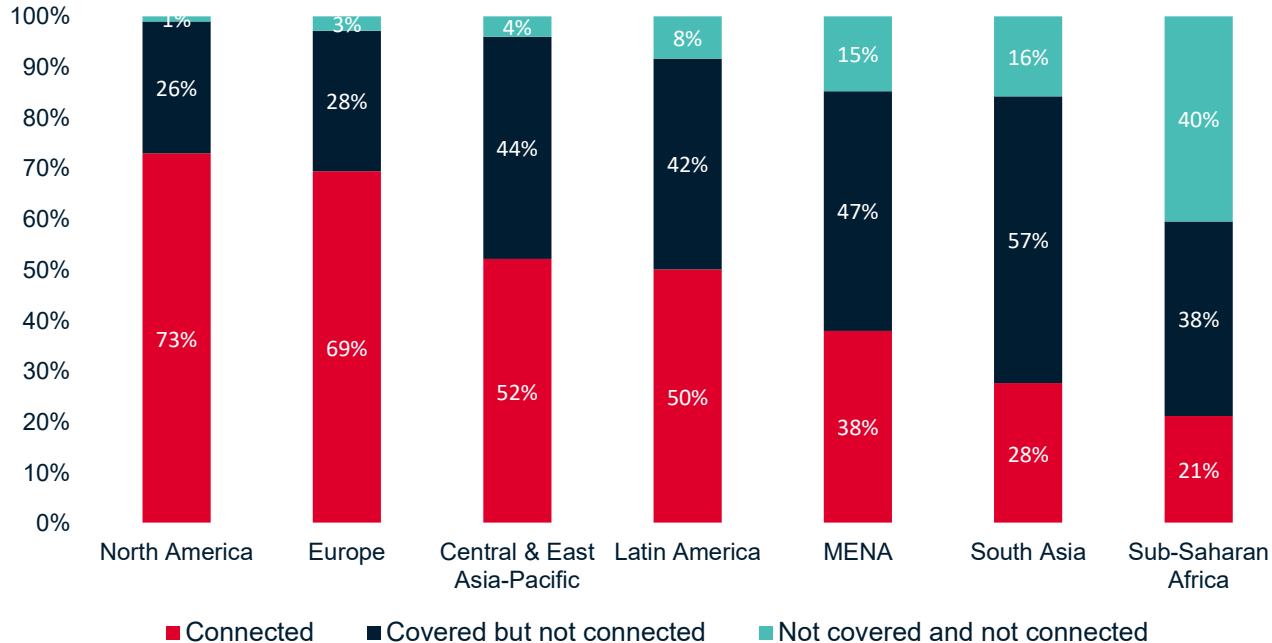
**Usage Gap** - 3 billion people live within the footprint of a network but are not accessing mobile internet services

**Demand-side factors just as important**



# Coverage Gap vs Usage Gap

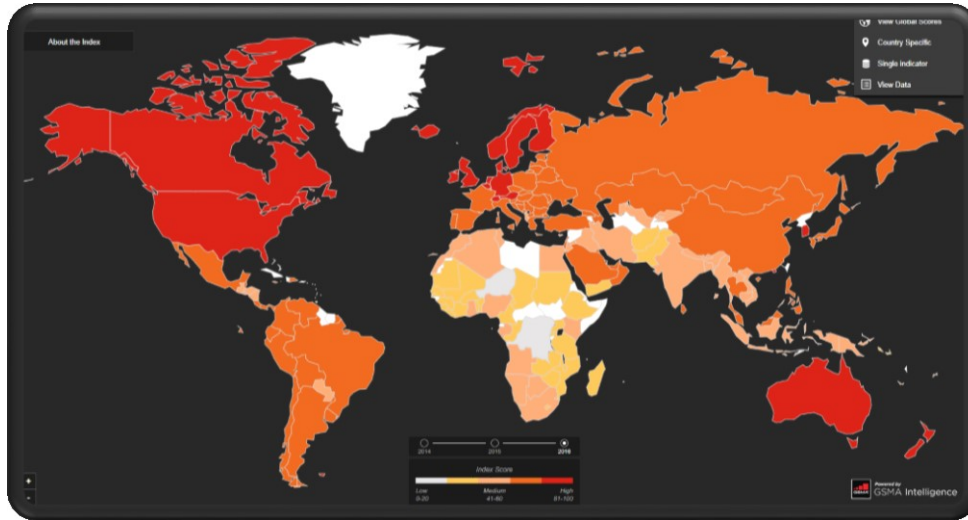
Connected and Unconnected Population (millions)



Coverage gap significant in Sub-Saharan Africa

Usage gap is much bigger in other regions

# Mobile Connectivity Index



**GSMA Mobile Connectivity Index quantifies the barriers to mobile internet access across four key enablers**



**Infrastructure**



**Affordability**



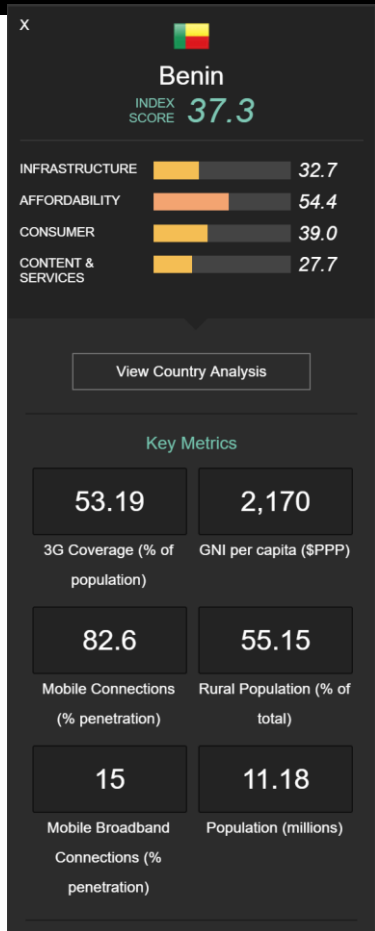
**Consumer**



**Content**

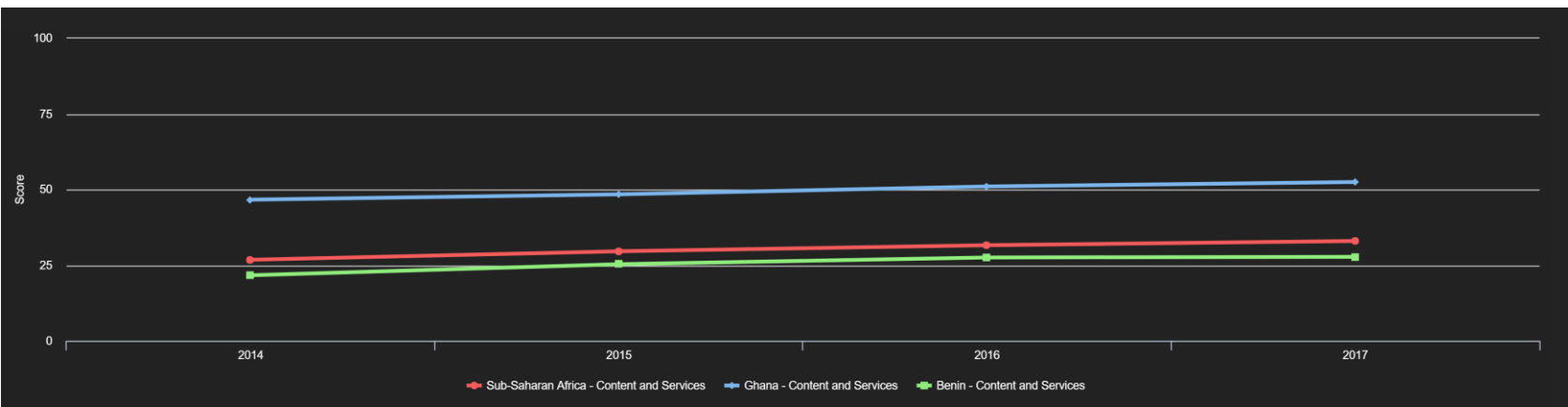
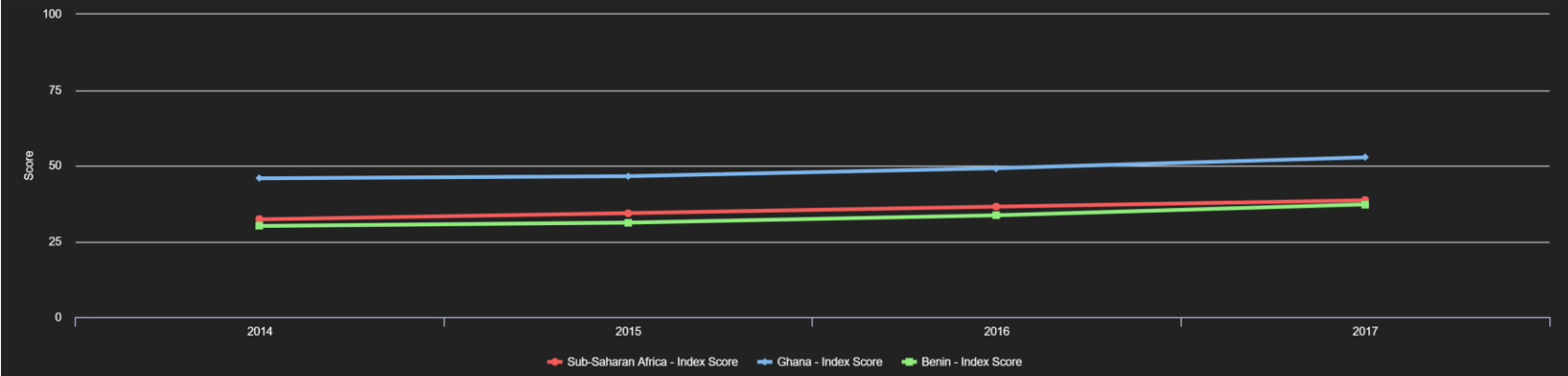
<http://www.mobileconnectivityindex.com>

# Mobile Connectivity Index

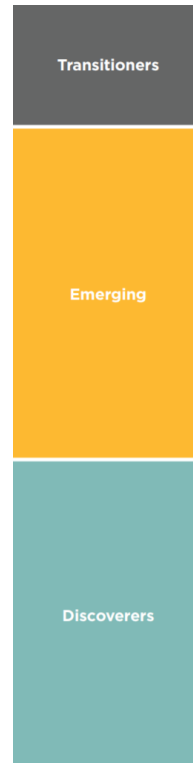
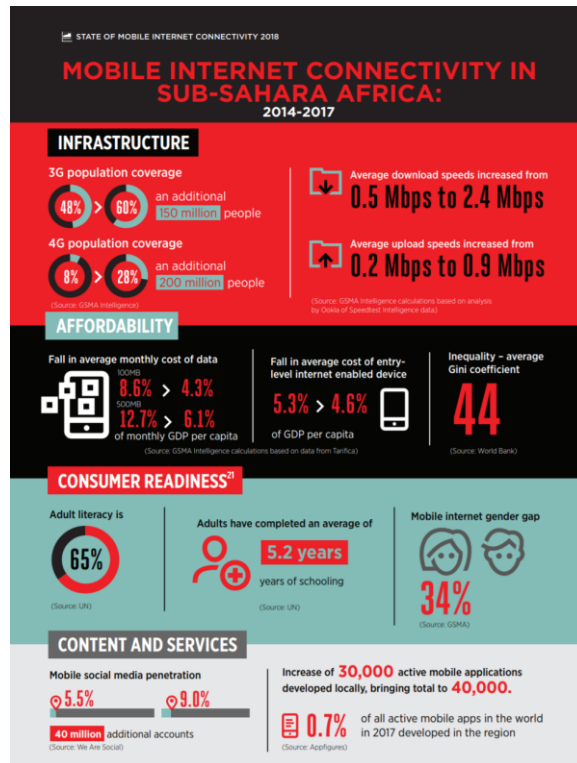
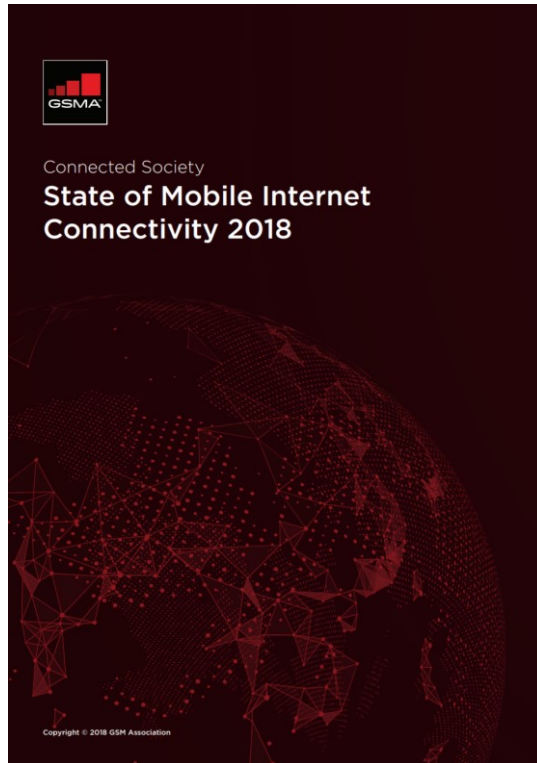


# Mobile Connectivity Index

You are comparing 3 Geographies looking at 1 Index Metric over All Years



# State of Mobile Internet Connectivity 2018



Mauritius	64.66
South Africa	59.89
<b>Cabo Verde</b>	<b>56.17 ▲</b>
<b>Ghana</b>	<b>52.73 ▲</b>
<b>Botswana</b>	<b>51.00 ▲</b>
<b>Kenya</b>	<b>50.95 ▲</b>
Angola	48.84
Gabon	47.68
Nigeria	45.91
Côte d'Ivoire	45.73
Namibia	45.25
<b>Lesotho</b>	<b>43.99 ▲</b>
<b>Cameroon</b>	<b>42.76 ▲</b>
Congo	42.04
<b>Zimbabwe</b>	<b>41.63 ▲</b>
<b>Rwanda</b>	<b>40.01 ▲</b>
<b>Tanzania</b>	<b>39.40 ▲</b>
<b>Swaziland</b>	<b>38.59 ▲</b>
<b>Ethiopia</b>	<b>37.68 ▲</b>
<b>Senegal</b>	<b>37.30 ▲</b>
<b>Benin</b>	<b>37.25 ▲</b>
<b>Uganda</b>	<b>36.49 ▲</b>
Sierra Leone	34.75
Liberia	33.08
Madagascar	33.01
Togo	31.97
Zambia	31.48
Mozambique	31.03
Gambia	30.95
Guinea	28.14
Mali	27.81
Congo, Democratic Republic	26.76
Burkina Faso	26.24
Burundi	24.67
Malawi	23.66
Chad	18.73
Niger	18.56



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