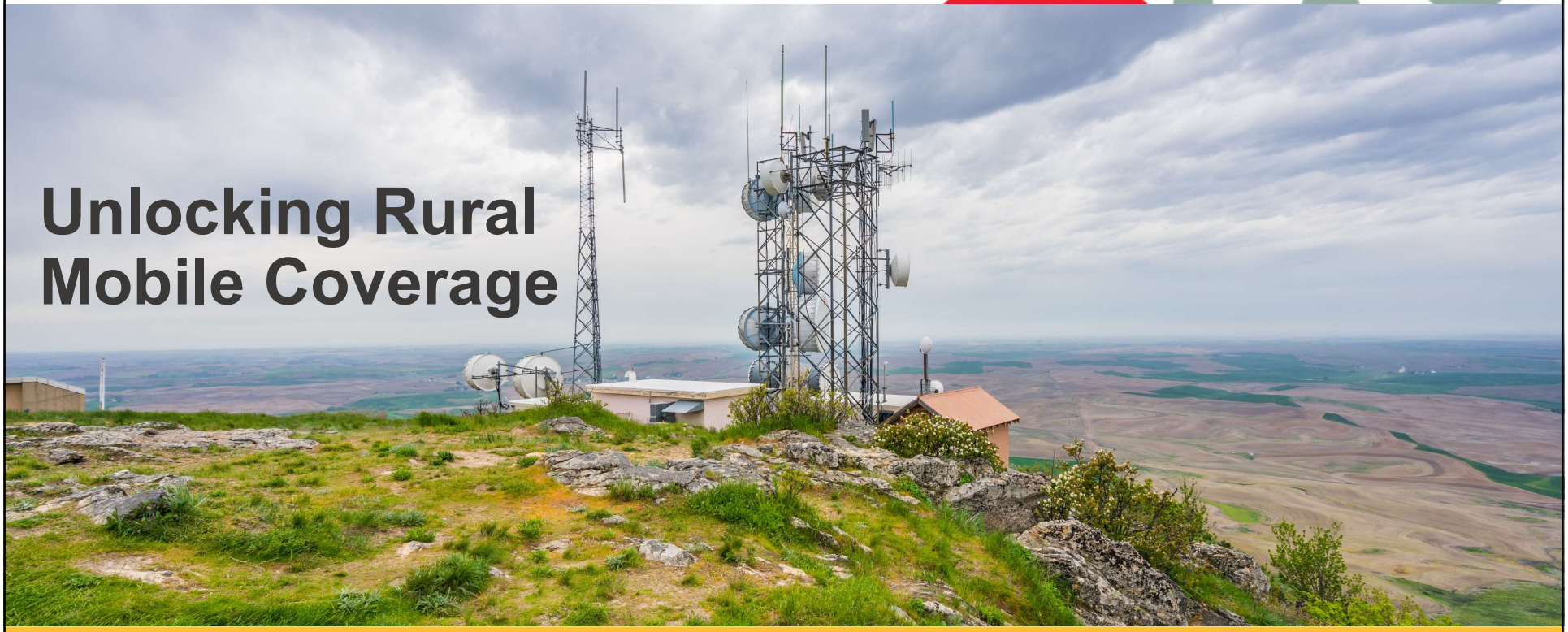
Unlocking Rural Mobile Coverage



GSMA Capacity Building

Discussion

- Why are you interested in this course?
- What area are you most interested in learning about through this course?

Course objectives: Unlocking Rural Mobile Coverage

By the end of this course, you will:

- Understand the challenges involved in bringing connectivity to rural areas.
- Be aware of what the mobile industry is doing to bridge the coverage gap.
- Understand best practices in policy and regulation to foster investment in rural networks.

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Unlocking rural mobile coverage course outline

1. Introduction: The mobile broadband coverage gap
2. Closing the gap: the role of the industry
3. Closing the gap: the role of government
4. Closing the gap: the role of demand
5. Extending coverage beyond the market frontier

Capacity Building

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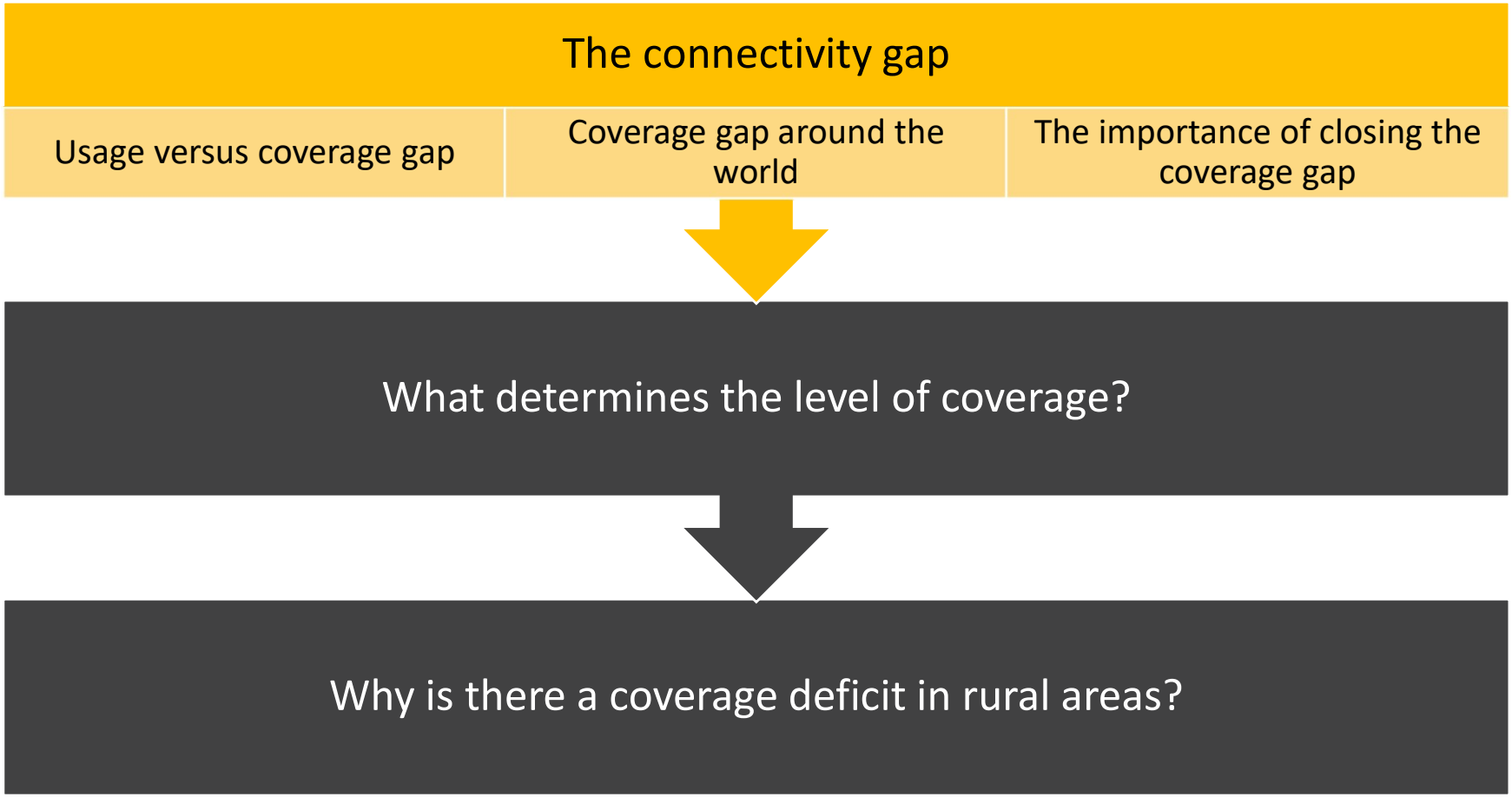
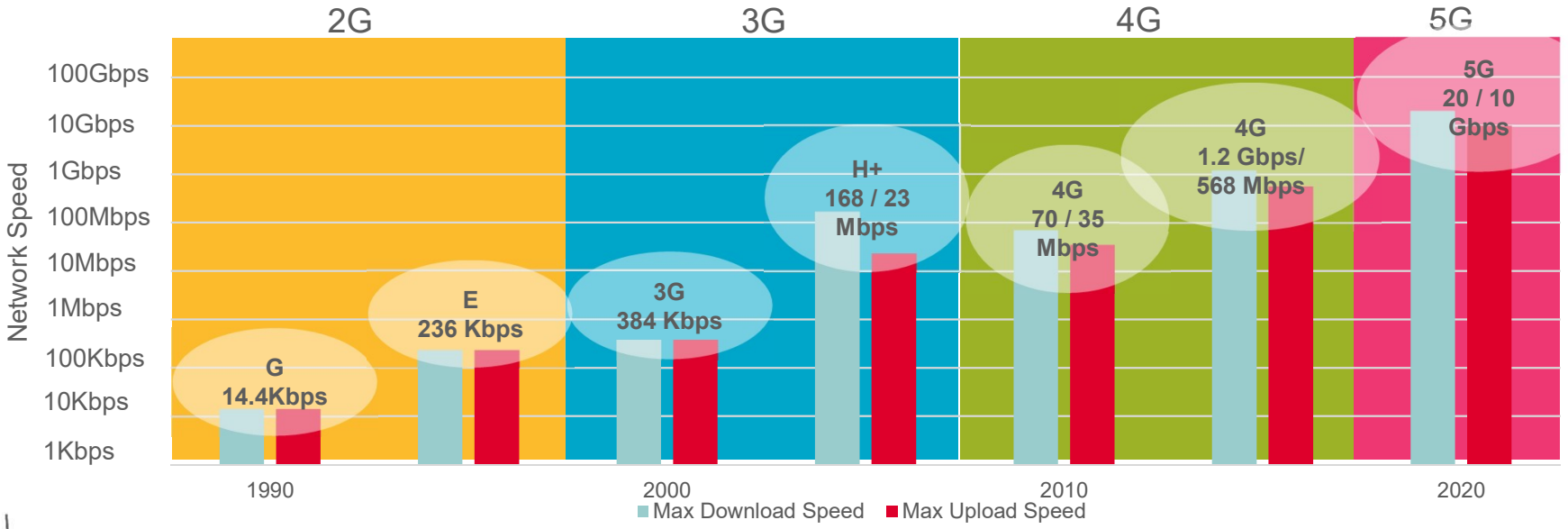
SESSION 1

Introduction: the mobile broadband coverage gap

The connectivity gap



Mobile internet versus mobile broadband



1G
Analog
Voice

Digital Voice,
SMS
Interoperable for
Global Adoption
2G, GSM, GPRS,
EDGE

Digital Voice, SMS,
Data
Video Telephony,
Internet Surfing
3G, UMTS, HSPA+

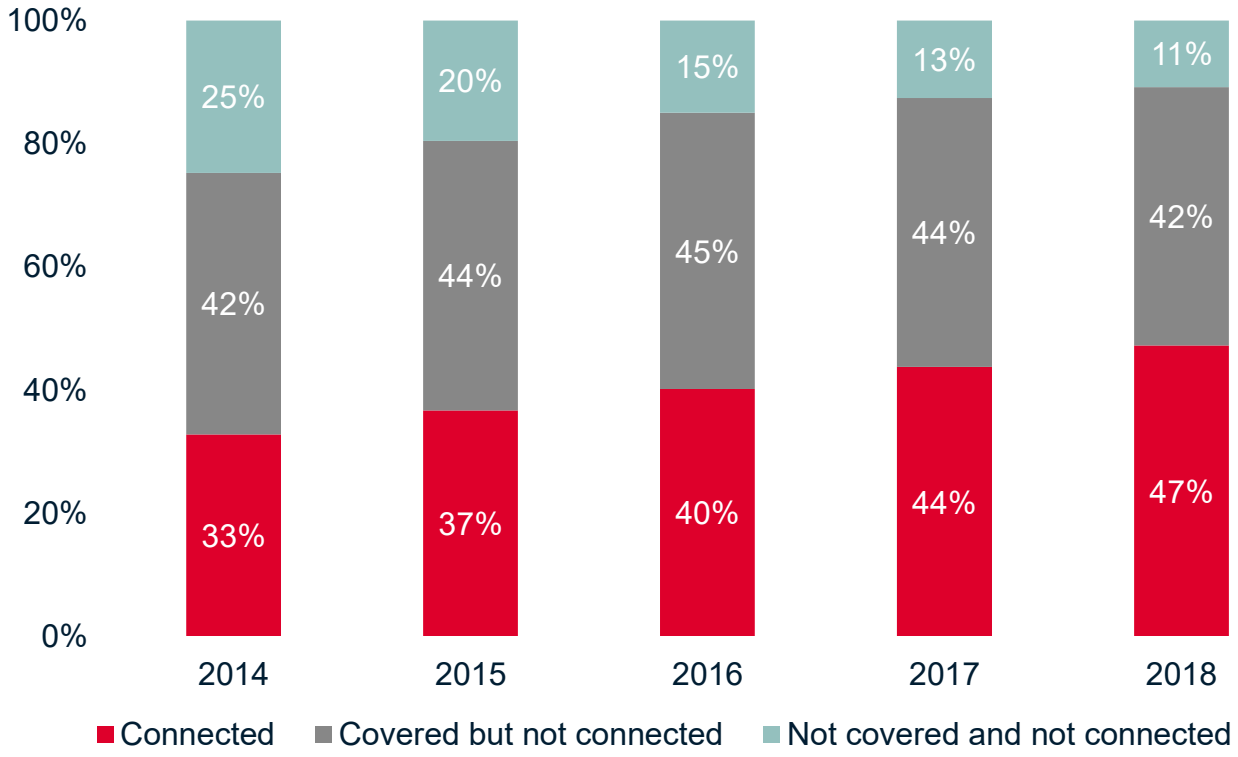
Digital Voice, SMS,
Data All-IP Design
Mobile Broadband
4G, LTE, OFDMA

5G Era of
Intelligent
Connectivity

Mobile broadband

Mobile internet

Usage gap versus coverage gap

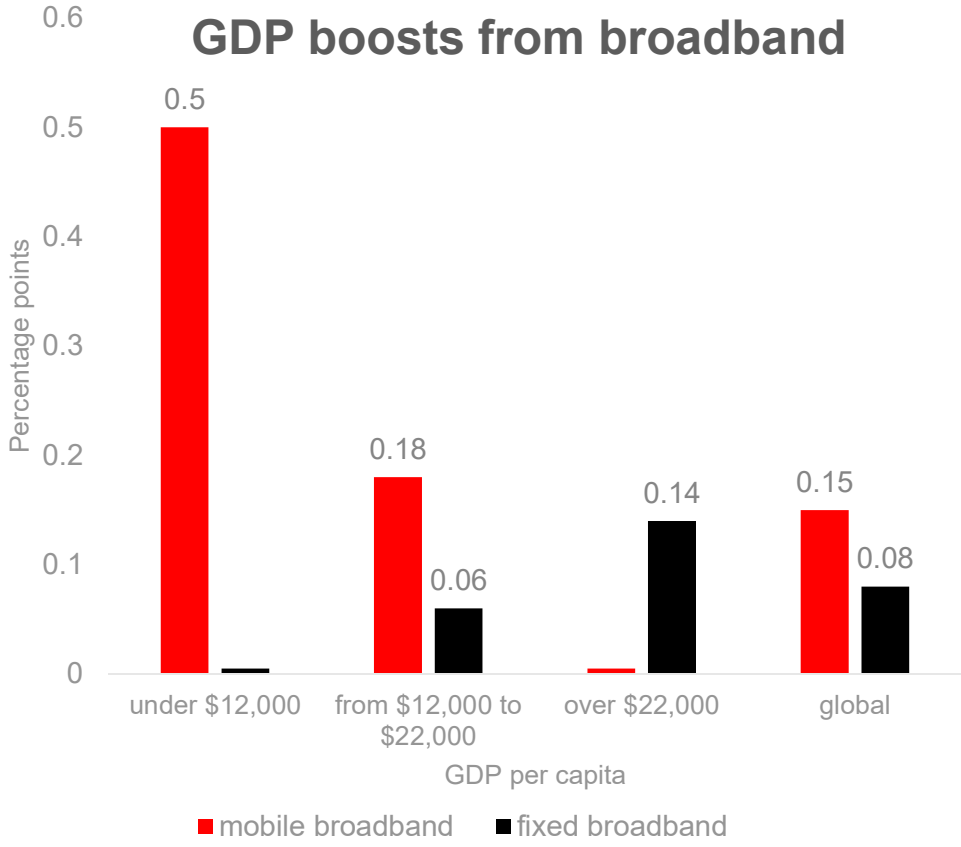


- 3.6 billion connected in 2018
- 300 million new mobile internet subscribers in 2018
- Coverage gap – more than 800 million not covered by 3G/4G networks
- Usage gap – 3.2 billion covered but not connected

*GSMA Intelligence, 2019

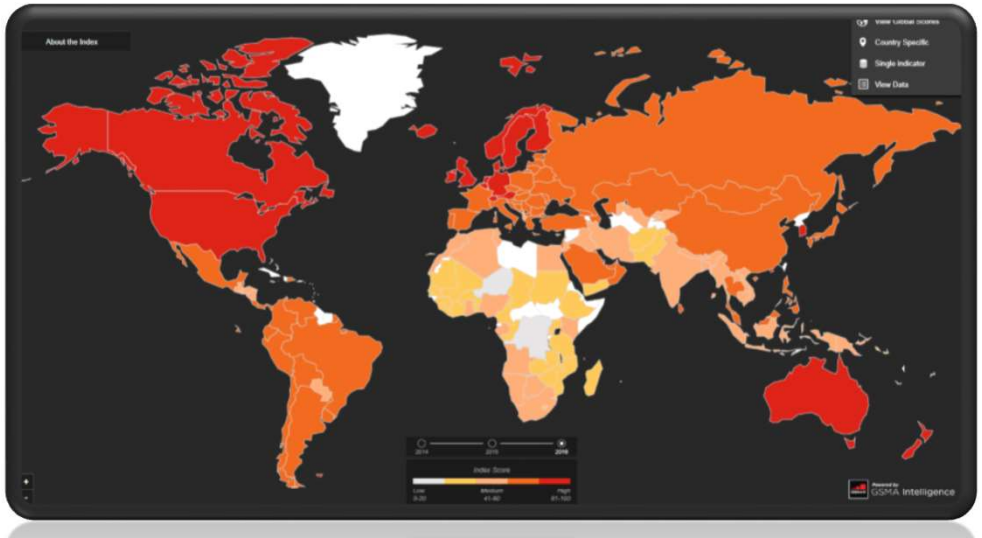
Bridging the connectivity gap is key for inclusive economic growth

- New services and jobs
- New business opportunities
- GDP growth
- Increase in direct and indirect taxes



*Qiang C Z-W & Rossotto C M with Kimura K (2009) *Economic Impacts of Broadband* in *Information and Communications for Development 2009: Extending Reach and Increasing Impact* New York, (US), World Bank.

Measuring the state of connectivity is key to start addressing the issues in any country



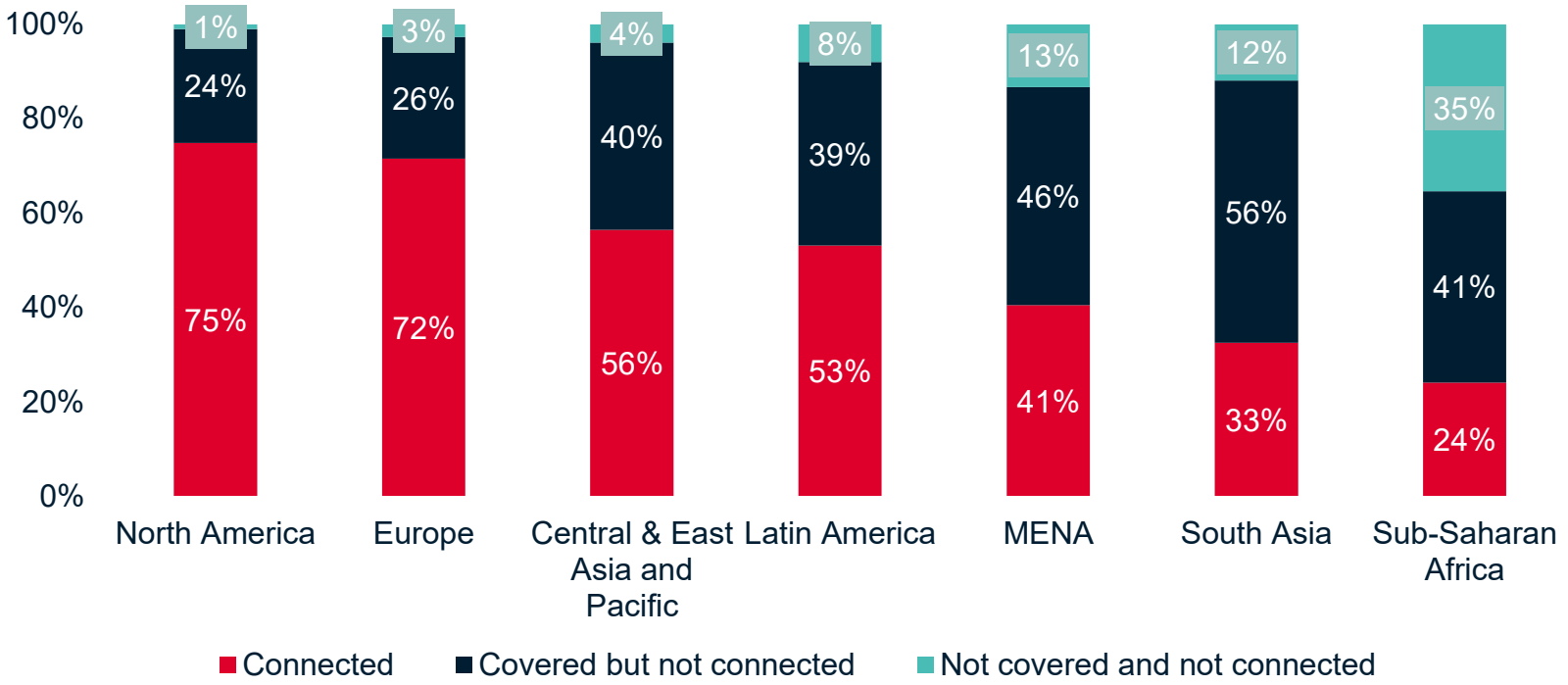
http://www.mobileconnectivityindex.com

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

- **Infrastructure**
- **Affordability**
- **Consumer Readiness**
- **Content & Services**

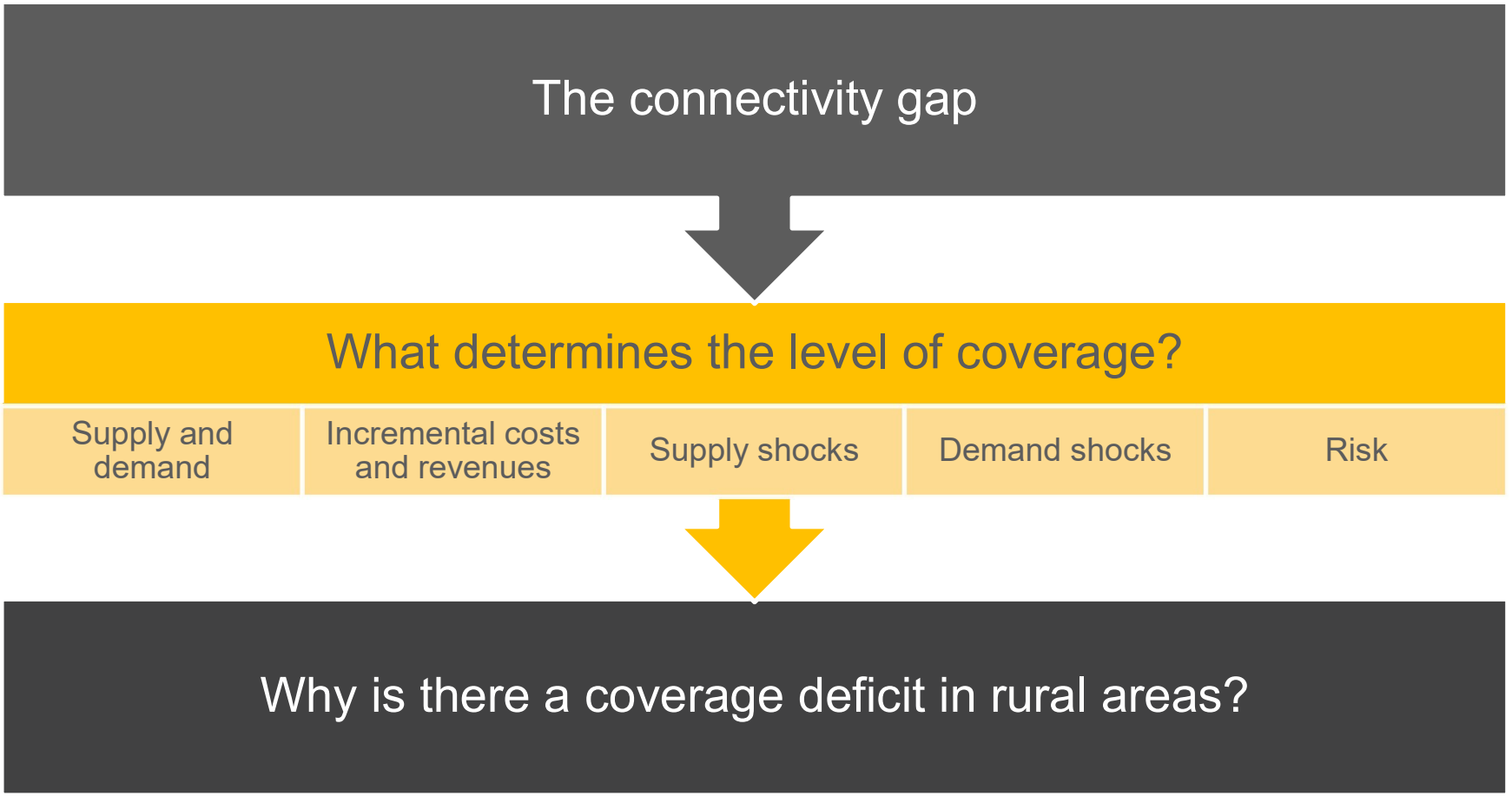
The connectivity gap around the world

- Sub-Saharan Africa is the only region where the coverage gap is larger than the usage gap.
- Around half of the total number of people worldwide lacking 3G coverage live in sub-Saharan Africa.
- Coverage remains an issue in parts of Asia and, to a lesser extent, in Central and Latin America.



*GSMA Intelligence, 2019

What determines the level of coverage?



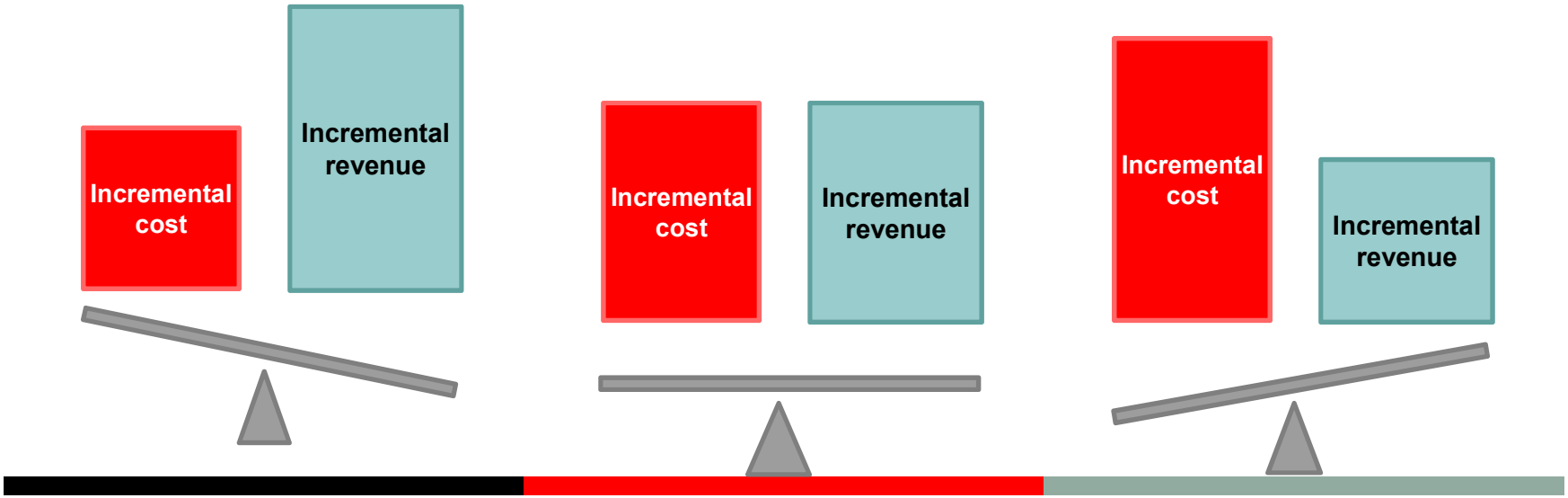
What is the *natural* level of coverage?

- What would be the expected level of coverage without intervention?
- Understanding this “natural” level of coverage before identifying the specifics of each market.
- The following slides establish the economic framework that will be used throughout this course.

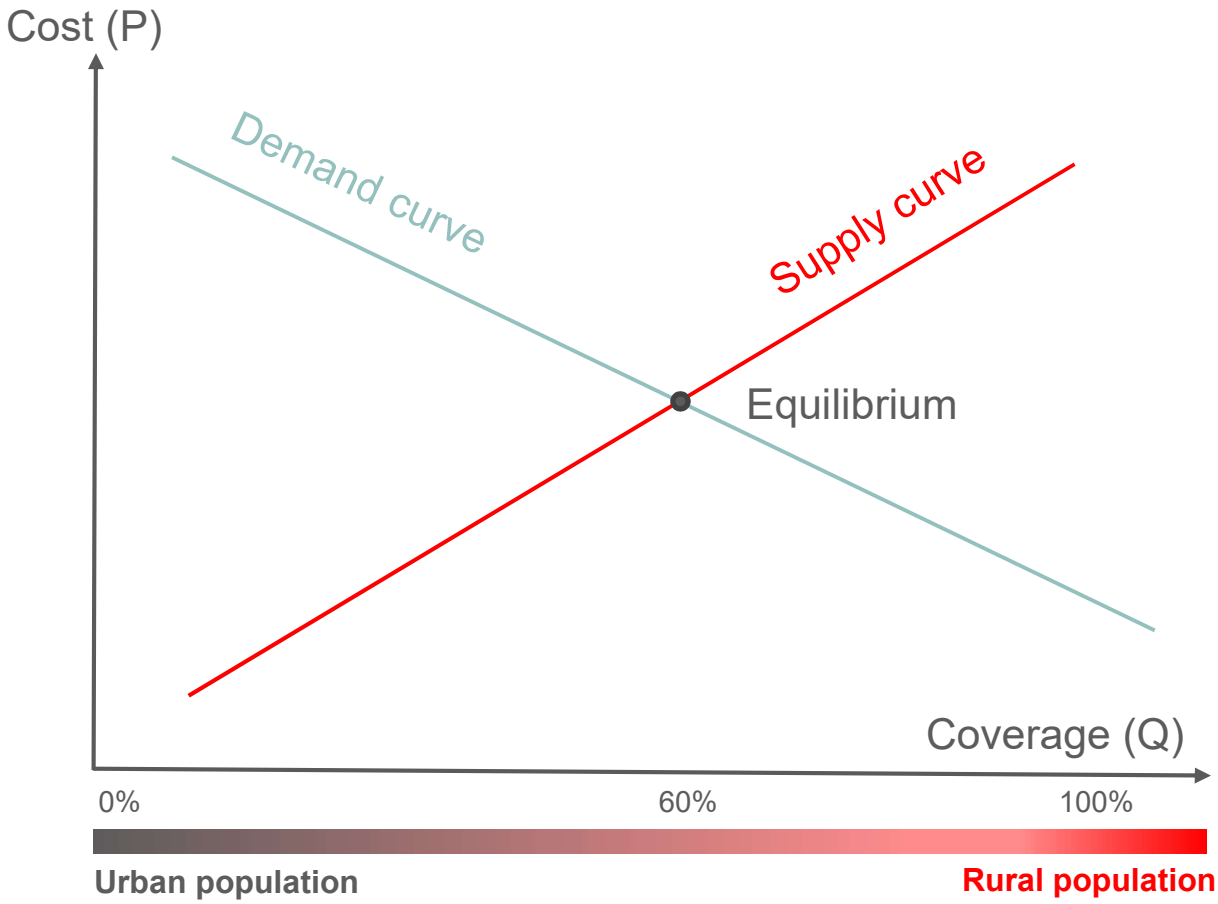
Site #1
Commercially viable
Revenues > costs
Deployment → Yes

Site #2
The last viable site
Revenues = costs
Deployment → Yes

Site #3
Not commercially viable
Revenues < costs
Deployment → No



Supply and demand for mobile services (1)



Supply and demand for mobile services (2)

Supply curve

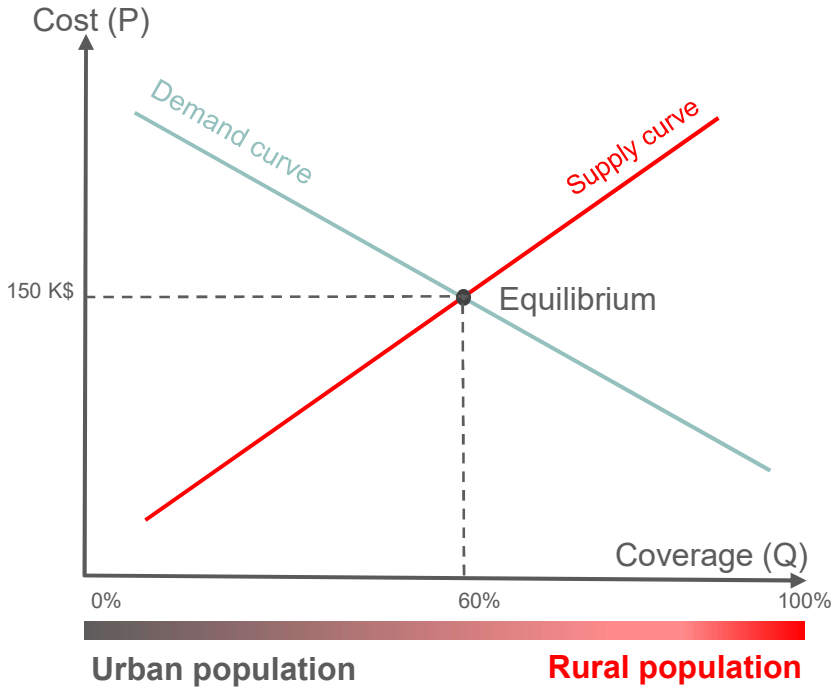
- Defined by incremental cost of covering an extra 1% of population.
- Upward sloping because cost increases as population density decreases.

Demand curve

- Defined by revenue per extra 1% of population covered.
- Downward sloping due to lower revenues in less densely populated areas (due lower income levels, lower literacy rates, etc.).

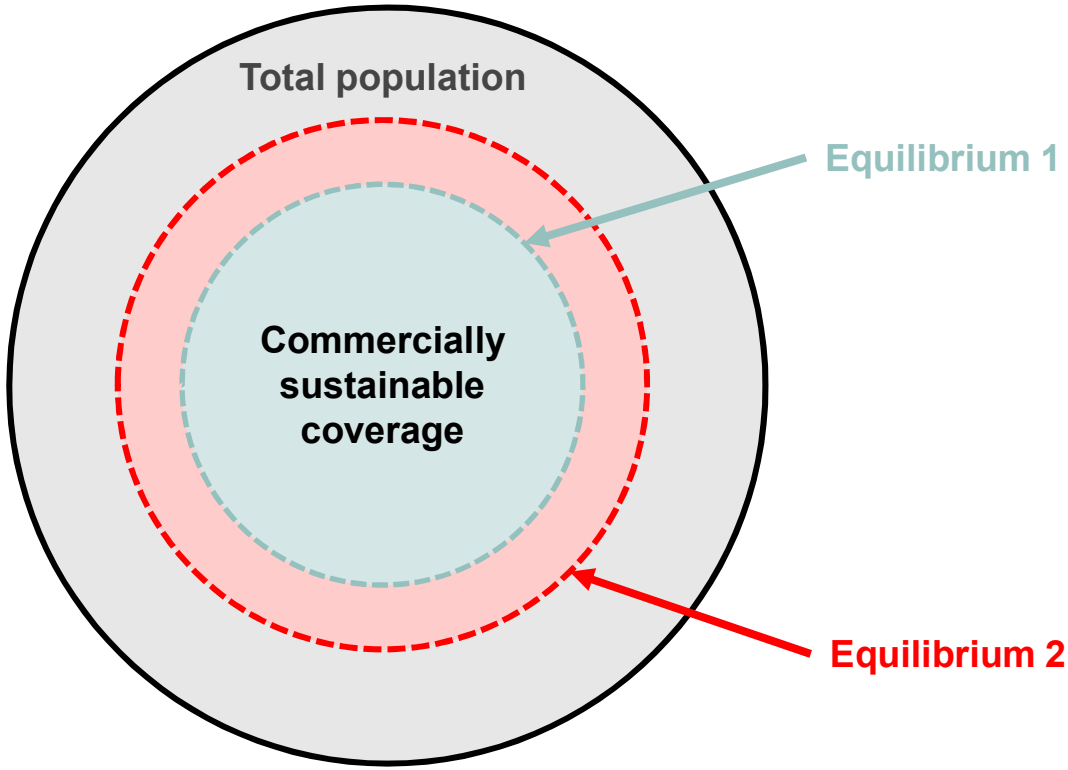
Equilibrium

- Point where supply meets demand.
- Coverage that operators will aim for to maximize revenue.
- Point of commercially sustainable coverage.



Commercially sustainable coverage

- The equilibrium on the margin determines the level of commercially sustainable coverage.
- Changes in the equilibrium will result in higher or lower coverage.



A supply shock affects the coverage equilibrium through costs

Supply shock

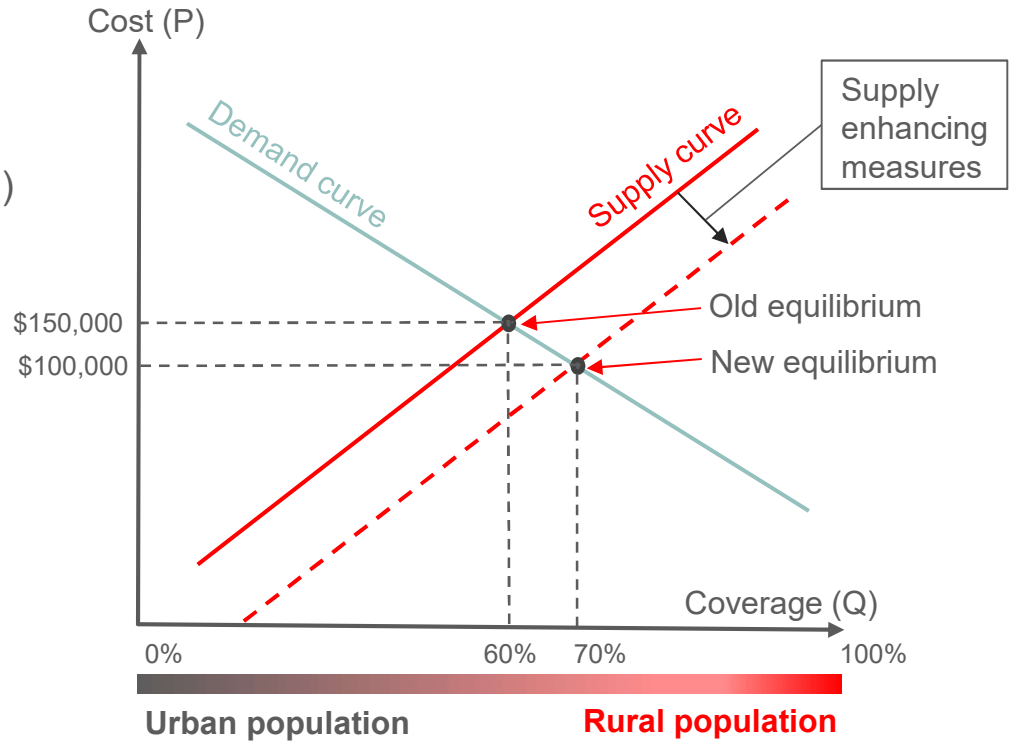
- Any measure or event that affects the incremental cost of providing coverage

Examples

- Technical innovation (base station, backhaul)
- Operational innovation (infrastructure sharing)
- Technical flexibility (release of spectrum, technology neutrality)
- Fees or taxes that impact costs
- Risk impacts costs!

Equilibrium

- Example: innovation in satellite backhaul reduces costs for rural broadband. Costs go from 150k to 100k, allowing operators to increase commercially sustainable coverage from 60% to 70%.



A demand shock affects the coverage equilibrium through revenues

Demand shock

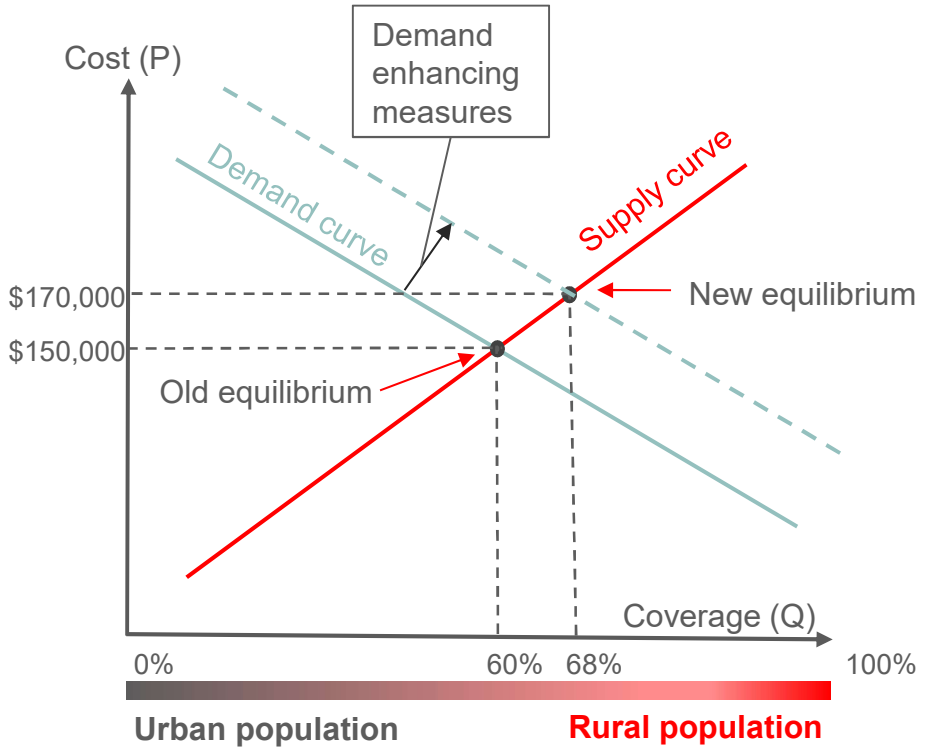
- Any measure or event that affects the revenues of an extra unit of coverage

Examples

- New service that increases value for customers
- Changes in purchasing power of population, making mobile services more affordable
- Improvements in literacy
- Removal of consumer taxes

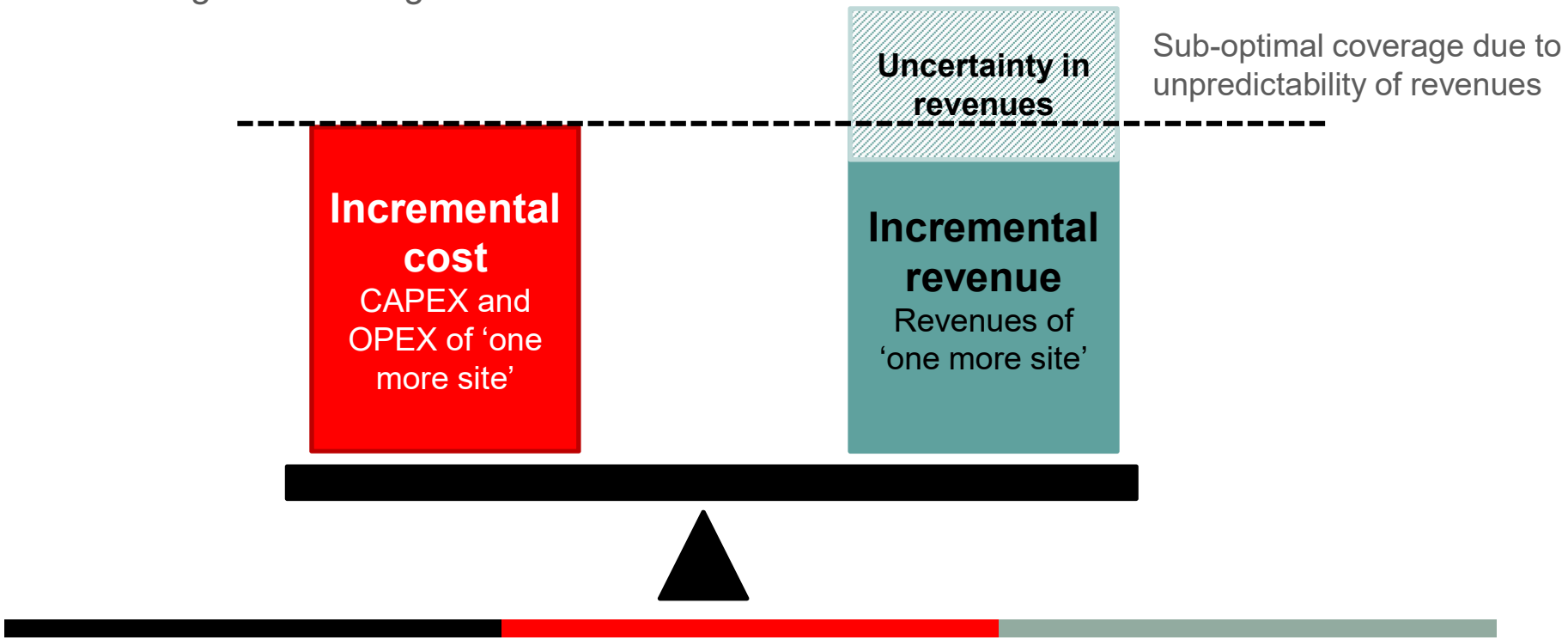
Equilibrium

- Example: government exempts smartphones from import duties. As a result, more people contract data plans, increasing the revenue per site.



Risk increases the cost and decreases the attractiveness of deploying infrastructure

- The cost of capital depends on the risk premium asked by investors or lenders to compensate for risky investments.
- Uncertainty on the expected revenues due to demand shocks increase the risk of investing 'on the margin'.



Why is there a coverage deficit in rural areas?

The Connectivity Gap

What determines the level of coverage?

Why is there a coverage deficit in rural areas?

High costs	Low revenues	High risks

Why is there a coverage gap in rural areas?

Costs in rural areas are high

Revenues are low

Risks are high (cost)

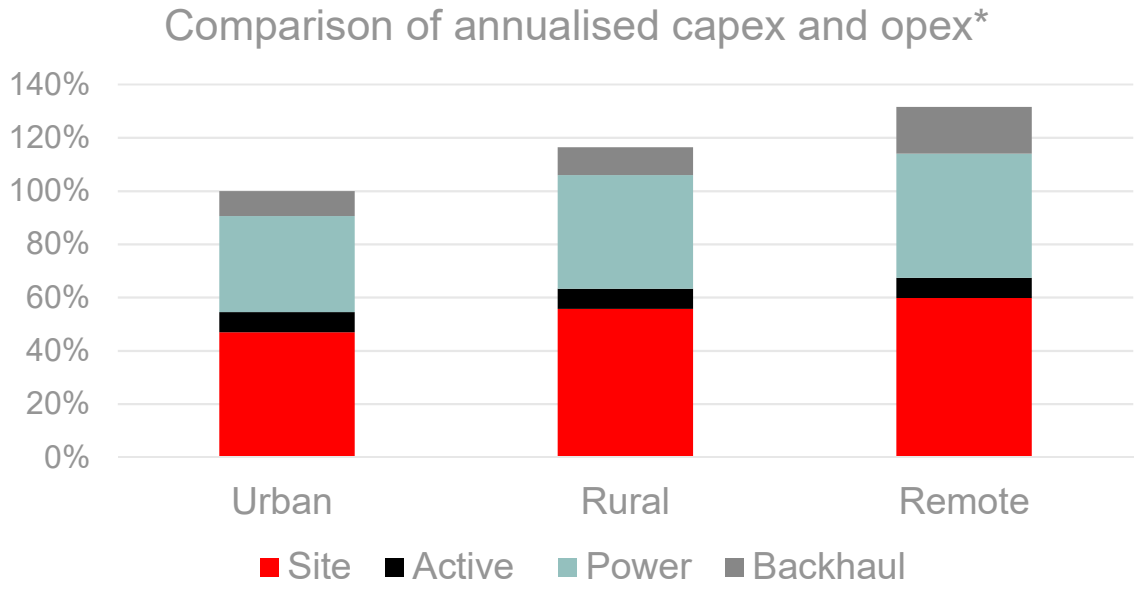
Benchmarked economic differences per site*

	urban	rural	remote
users per site	100%	-60%	-80%
revenues per site	100%	-80%	-90%
Opex per site	100%	+25%	+100%
Capex per site	100%	+5%	+30%

*Touchard, G (2017) *Unlocking Rural Coverage: Enablers for Commercially Sustainable Mobile Network Expansion* London, (UK). GSMA. https://goo.gl/cwdsWZ

High costs in rural sites are mainly driven by logistics, backhaul and power

- Challenging logistics increase the initial cost of deploying a site.
- Backhaul CapEx and OpEx can be substantially higher in rural areas (multihop or satellite)
- Powering sites that don't have access to the grid increase both OpEx and CapEx.



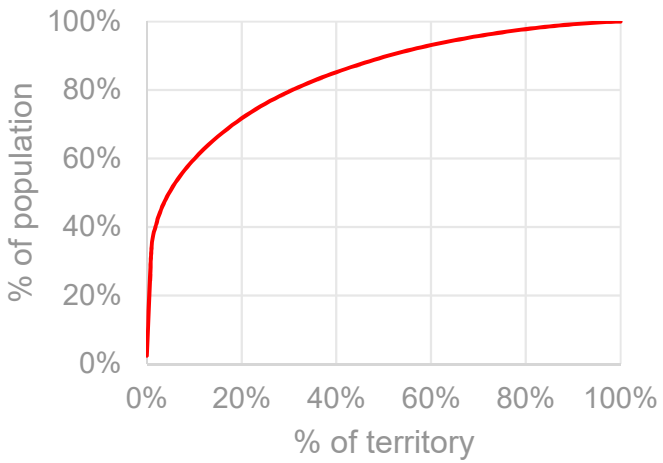
*GSMA Connected Society Programme

Low revenues in rural areas are the result of low population density and low income levels

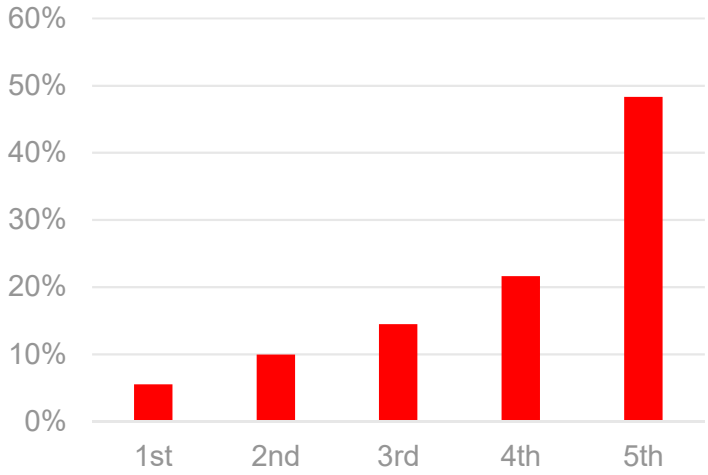
Low population density: the last 20% of the population lives spread out across 70% of the territory.

Low income levels: rural populations are often from lower quintiles where average revenue per user (ARPU) is below $1.

Population distribution in the DRC*



DRC revenue distribution per population quintile**



*GSMA Connected Society Programme
** The World Bank

Higher risk of missing target revenue in rural areas

The cost of capital can have a big impact on rural coverage where margins are already low.

Idiosyncratic risks in rural areas come from:

- Lack of accurate information on revenues (population, income levels)
- Security and political instability
- Operational issues due to lack of infrastructure (power outages, inaccessible roads for maintenance and airtime distribution, etc).

*GSMA Connected Society Programme

Both industry and government have a role to play in making rural coverage commercially sustainable

- Making rural coverage commercially sustainable is key to closing the coverage gap
- Commercial sustainability requires enhancing both the demand and the supply of mobile services
- Mobile operators, as well as the government, have an active role to play on both fronts
- Our goal today is to discover the concrete actions that operators and the government can take to unlock rural connectivity:

	Mobile operators	Government
Foster demand		
Foster supply		

Capacity Building

1

SESSION 1

Group Discussion

- In your country what are the biggest obstacles to expanding coverage into rural areas?
- Is extending the reach of mobile broadband a priority for your country?