Welcome!

Welcome

Luiz Felippe Zoghbi

Spectrum Engagement Director,
GSMA

THE GSMA
WAS FOUNDED IN
1987

MORE THAN
750
MOBILE OPERATORS

WITH OVER
350
COMPANIES
in the broader mobile ecosystem

15 OFFICES WORLDWIDE

SHANGHAI
SAN FRANCISCO
BEIJING
SAO PAULO
NAIROBI
NEW DELHI
LONDON
DUBAI
ATLANTA
BRUSSELS
BARCELONA
HONG KONG
BRASILIA
BUENOS AIRES

Connecting Everyone and Everything to a #BetterFuture

The mobile industry is the first to formally commit to the UN Sustainable Development Goals

The GSMA works to deliver a regulatory environment that creates value for consumers by engaging regularly with:

MINISTRIES OF TELECOMS
TELECOMS REGULATORY AUTHORITIES
INTERNATIONAL & NON-GOVERNMENTAL ORGANISATIONS

CONNECTING
23,000+
Industry Experts
Exclusively for GSMA Members, InfoCentre² is your place to connect with a global community of industry experts

GSMA Working Groups provide frameworks and standards in commercial, operational and technical matters that help maintain and advance mobile industry ecosystems

47%

of MENA's population live within the footprint of a mobile broadband network but are not using

4%

live outside mobile coverage

GSMA

Spectrum

The right amount

Planned in advance

For an affordable price

At the right time

Towards investment

GSMA

Welcome!

Welcome

Shahir Boshra

Secretary General of EiTESAL

Plans for a digital and prosperous future in Egypt

Eng Wael Sayed

Head of Radio Spectrum Sector, NTRA

Plans for a digital and prosperous future in Egypt

H.E. Eng Hany Mahmoud

Former Minister of CIT, Egypt
Chairman, Vodafone Egypt

Roadmaps for inclusive growth and socio-economic impact

Amr Hashem

Policy Director, MENA
GSMA

Towards a Digital Economy Strategy for Egypt

Mona El-Badry

Director, Strategic Publications Department, Cabinet IDSC, Egypt

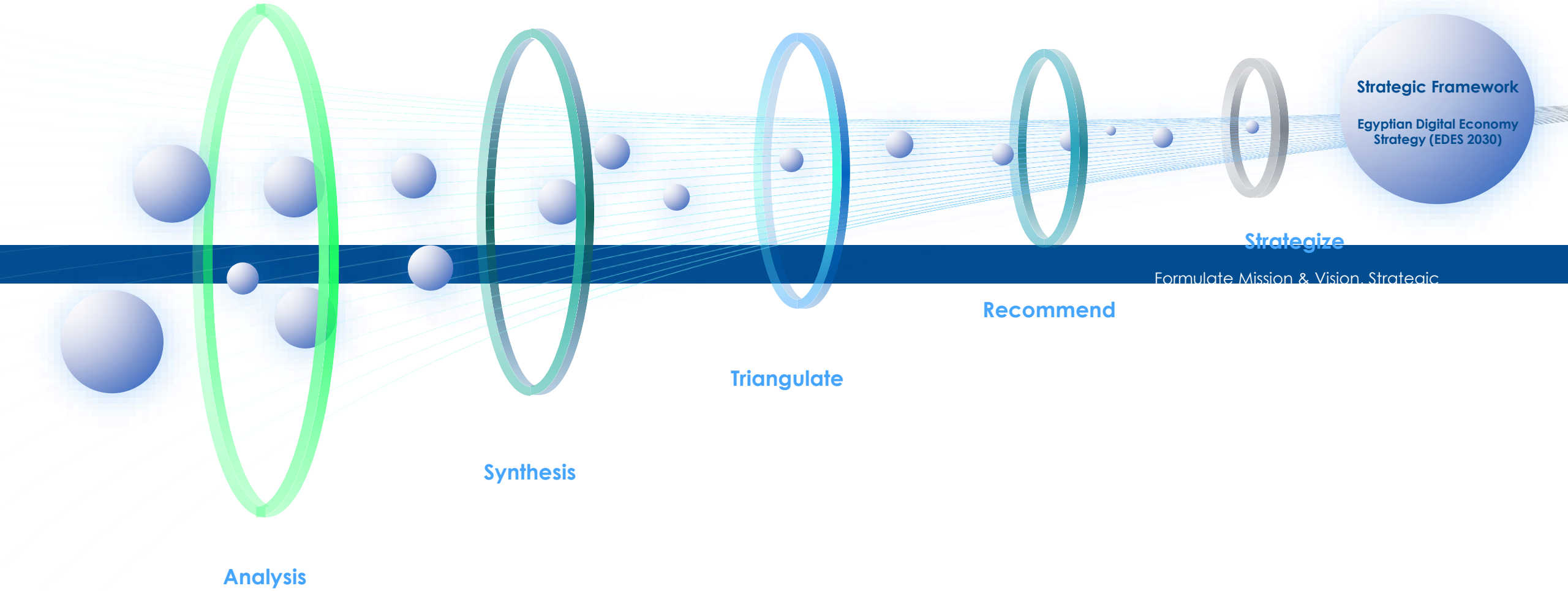
Dr Safa Mostafa

International ICT Government Strategies Consultant

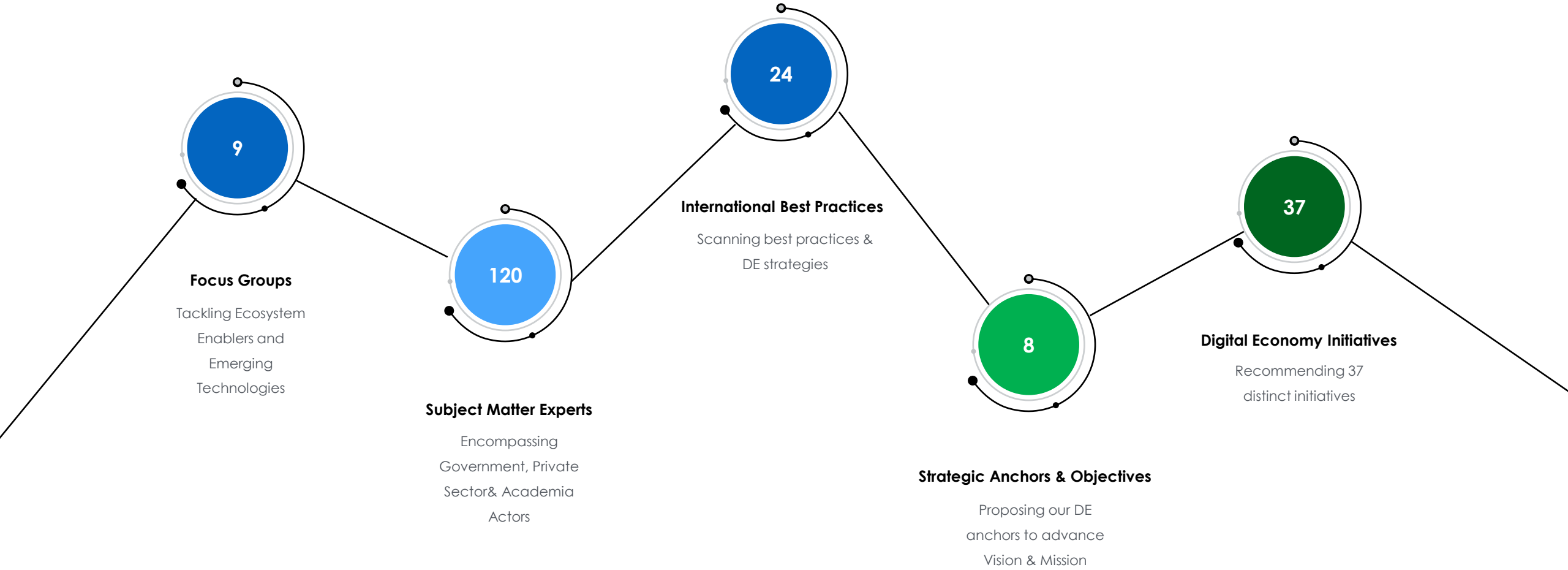
Proposed Strategic Framework for

Egyptian Digital Economy Strategy (EDES) 2030

1. Formulation Process & Strategic Framework Coverage
2. Foundational Approaches
3. Synopsys on Project's Main Deliverables
4. Synopsys on the Strategic Framework – Main Highlights

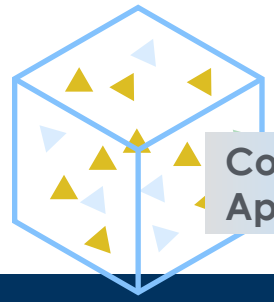

Strategic Framework
Egyptian Digital Economy Strategy (EDES 2030)
Strategize
Formulate Mission & Vision, Strategic
Recommend
Triangulate
Synthesis
Analysis

Coverage of the Strategic Framework



Integrative Approach

- Merging diverse ideas
- Developed on a cross-sectoral basis
- Building a Comprehensive framework at a granular level

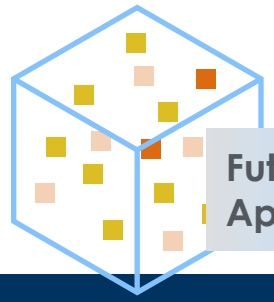


Collaborative Approach

- Developed based on FGs Discussion
- Derived from stakeholders with multidisciplinary backgrounds
- Proposed initiatives to be implemented collaboratively by multiple stakeholders

Opportunity Balance Approach

- Mitigating the impact of Opportunity cost
- Addressing the interconnections and complexities
- Providing decision-makers with a higher level of flexibility

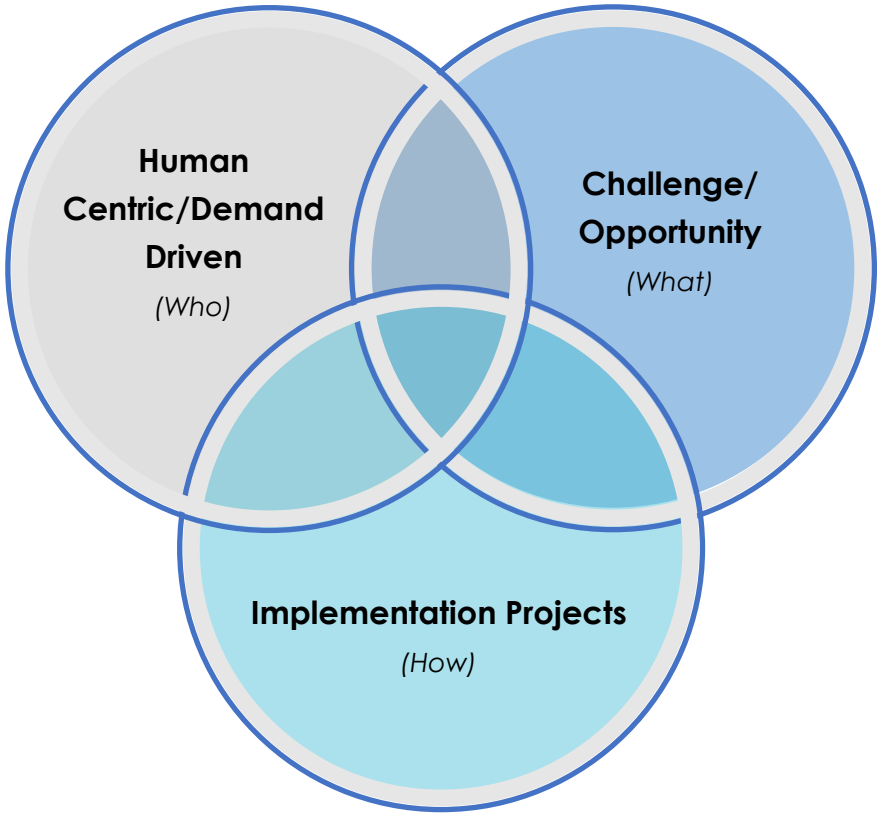


Future Proof Approach

- Based on an Agile Design
- Investigating untapped opportunities
- Enhancing Innovation Every Step of the Way

Initiatives Formulation Approach

Formulated to answer …



Formulated based on …

1

Boosting Current Initiatives

Tweaking and building on current initiatives to enhance the Egyptian digital economy

2

Based on one/multiple Int'l Best Practice

Proposing new initiatives based on international best practices, while fitting the local context

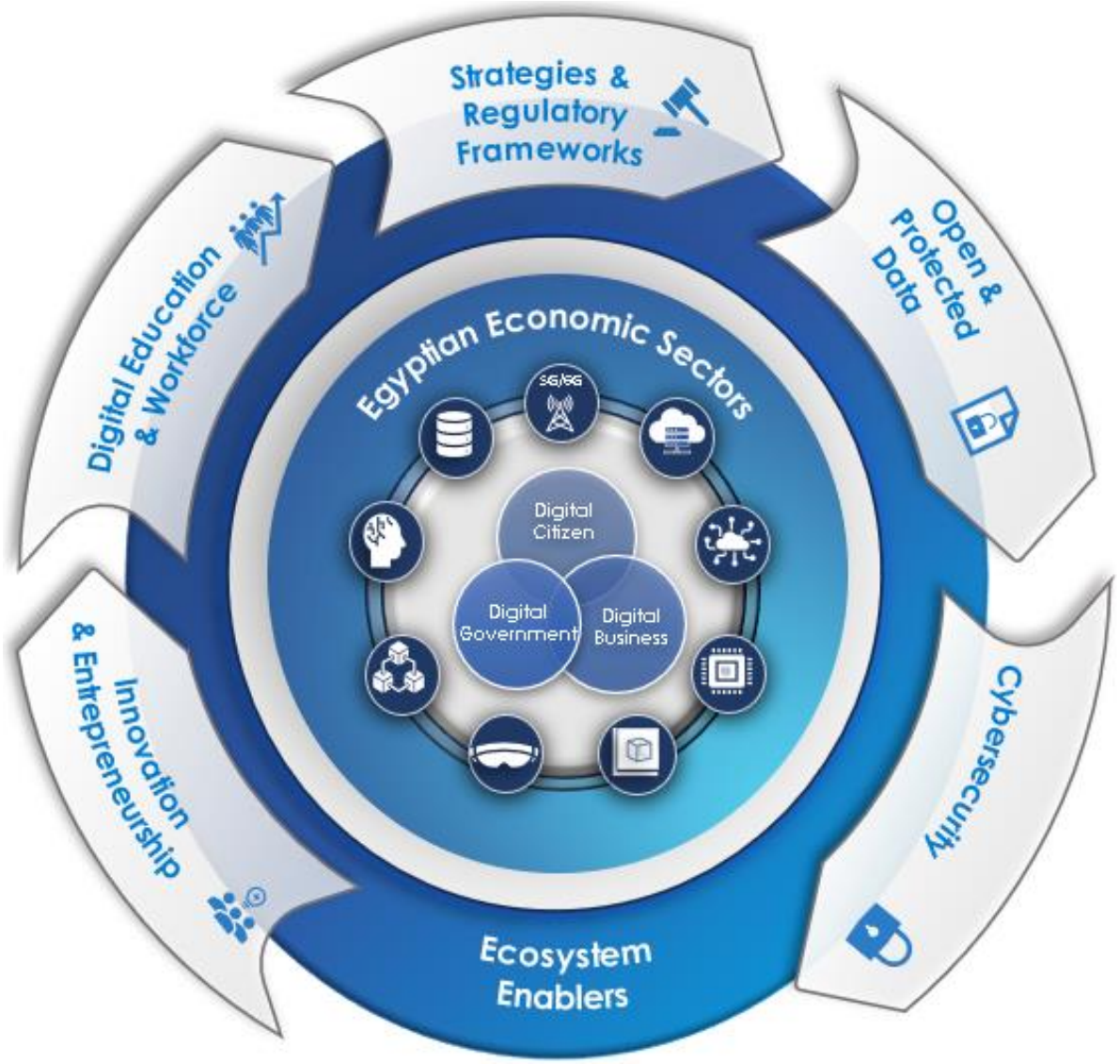
3

Proposed by Experts

Proposing new ideas inspired by brainstorming sessions in focus groups

Synopsys on Project's Main Deliverables

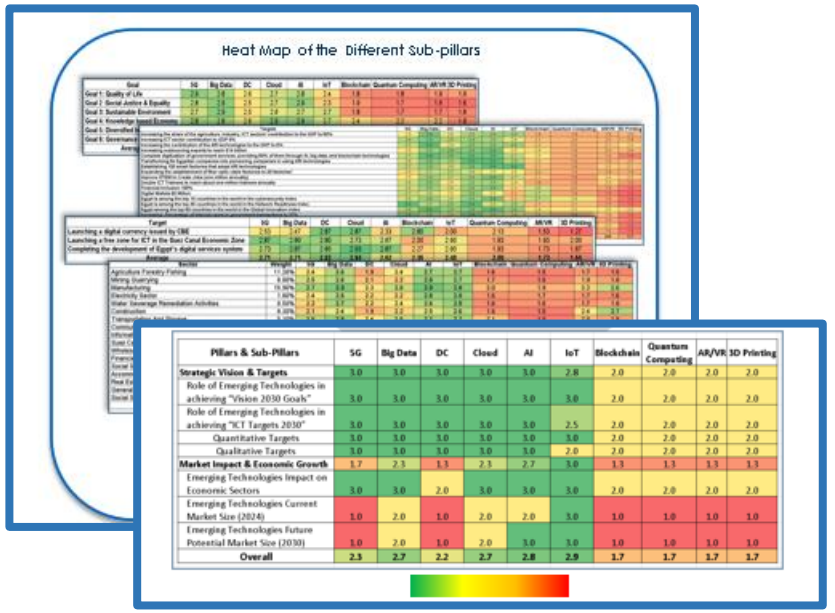
Mapping the Interlinkages between EDE, Emerging Technologies & their Supporting Ecosystem



Synopsys on Project's Main Deliverables

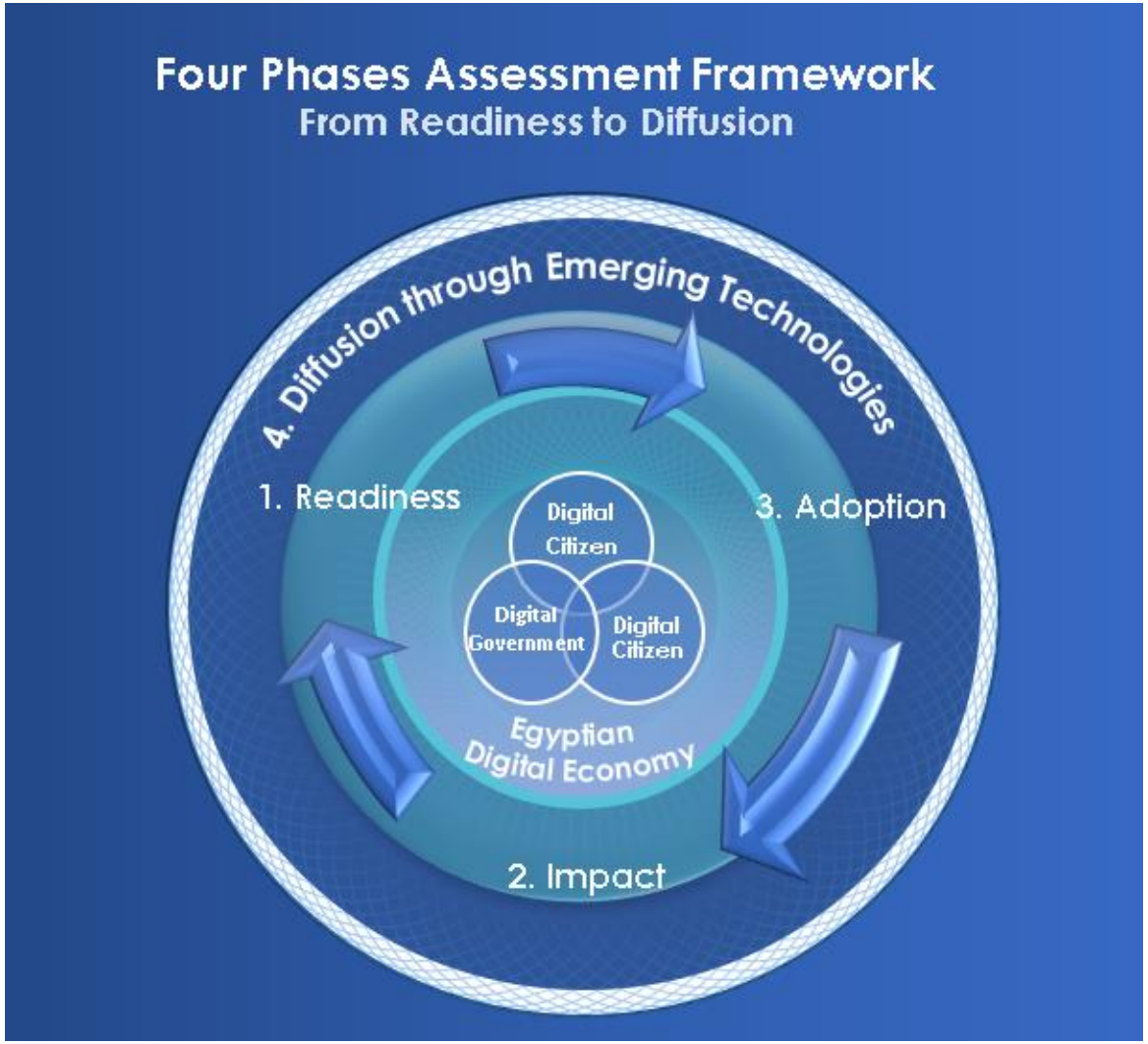
Emerging Technologies Prioritization

Results



Four Emerging Technologies scored as high priority: IoT, AI, Cloud Computing, and Big Data and Analytics. The remaining technologies were classified as medium priority, with 5G ranked first, followed by Data Centers, Blockchain, Quantum Computing, AR/VR, and 3D Printing.

Synopsys on Project's Main Deliverables



Synopsys on the Strategic Framework – Main Highlights

Vision

Empowering sustainable and inclusive growth through a human-centered digital economy that drives Egypt's development forward

Mission

Developing a cross-sectoral and collaborative approach to boost our international positioning and achieve digital sovereignty

Synopsys on the Strategic Framework – Main Highlights

Strategic Anchors Shaping the EDE Strategy

Synopsys on the Strategic Framework – Main Highlights

Anchor 1: WC Infrastructure & Secured Data

Developing a world-class (WC) infrastructure ecosystem by optimizing existing assets, integrating advanced technologies, and prioritizing data as a central production factor

Anchor 2: Dynamic Investment Environment

Enhancing a robust and dynamic environment to attract local and international investment in the digital economy while forging strategic digital partnerships

Anchor 3: Fostered ETs Adoption

Creating a clear implementation pathway and systematically bridging the gap between supply and demand to accelerate the integration of Emerging Technologies (ETs) into the digital economy

Anchor 4: Localization & Exports Promotion

Focusing on import substitution, export promotion, enhancing supply chain resilience, and strengthening small and mid-sized firms

Anchor 5: State-of-the-Art Skills Development

Fostering an aware and equipped generation by driving a cultural shift that balances the impact of machine learning and AI, while advancing professional excellence through state-of-the-art educational and industry practices

Anchor 6: Future-Proofing Innovation

Building a future-proof ecosystem to enhance Egypt's digital economy and boost its international competitiveness in the innovation race

Anchor 7: National Digital Sovereignty

Achieving national digital sovereignty through robust infrastructure and self-reliant technologies that harness the power of National Data

Anchor 8: Fit for Purpose DE Legal & Regulatory Environment

Establishing a robust and adaptive legal and regulatory framework that effectively supports Digital Economy growth, fostering innovation while ensuring compliance and protecting rights

Spotlight on selected Initiatives

Optimization Initiatives

- Cross-Sectoral AI Applied Innovation Center
- SME Cloud Excellence Center
- DigiMatch Platform
- EDE Measurement Initiative
- ETs Skills Development Roadmap
- Egyptian Dialect LLM Development Initiative

Enablement Initiatives

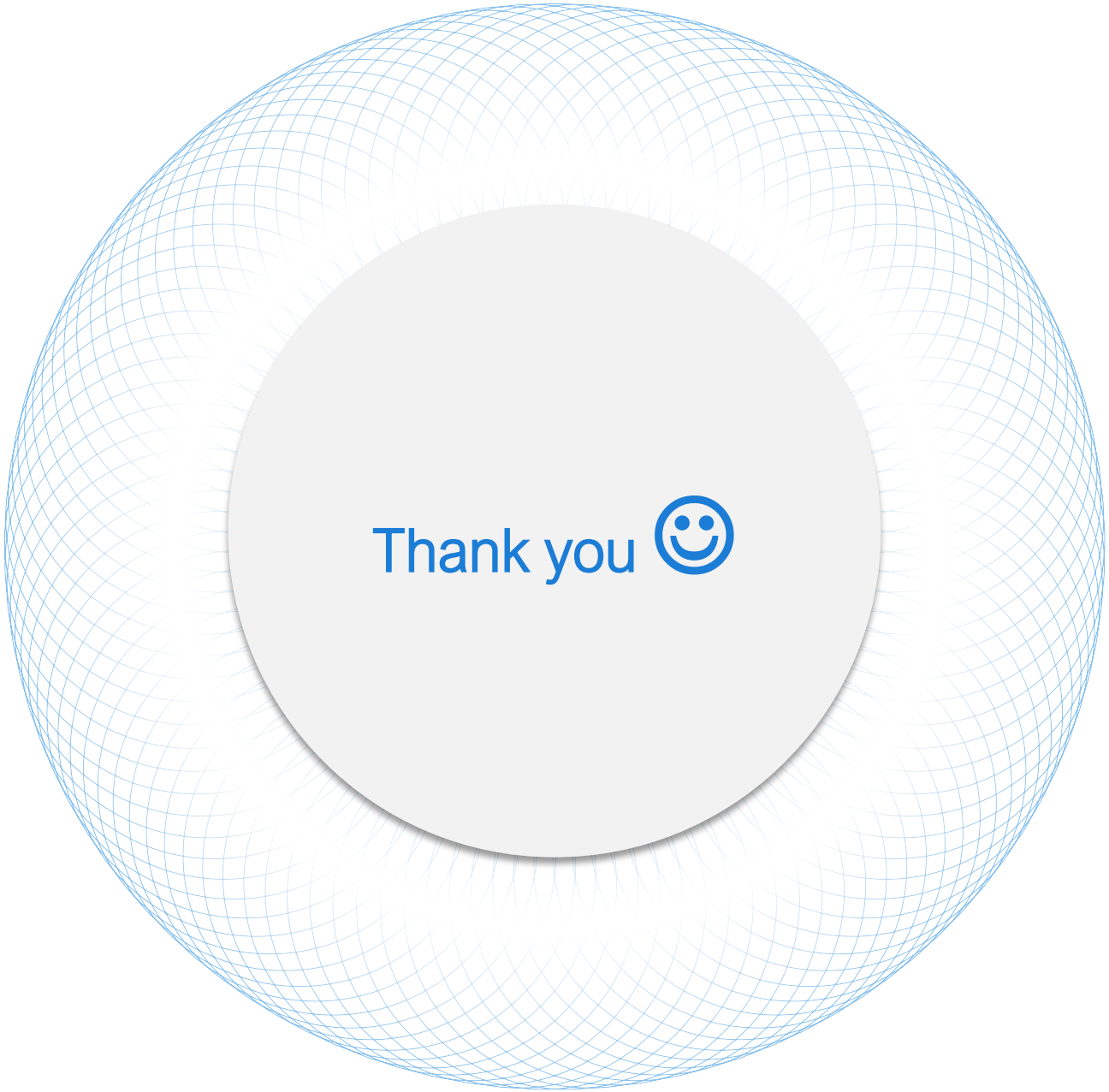
- "GIGA Egypt" Gigabit Fiber BB Development
- "Unleashing 5G and 5.5G Potential"
- DCs and Cloud Computing Investment
- Egyptian Super Computing Network
- Open Data and API Programs

Sustainability Initiatives

- "Channel Your Voice"
- Future Ready Use Case Blueprint
- Digital Supply Chain Alliance
- "Digital Legislation Revitalization"
- "DE Regulatory Hub"

Disruptive Initiatives

- Deep Tech Investment Magnet
- Egyptian RWAs Tokenization
- NextGen Digital Law Initiative
- Egypt's Cross-Border Digital Payments Network (E-CBDX)


Thank you

Roadmaps for inclusive growth and socio-economic impact

Moderator

Amr Hashem
GSMA

Mohamed El-Moghazi
NTRA, Egypt

Mahmoud El Khateeb
Vodafone Egypt

Fatima Karim
Huawei

Break

11:30-11:45

Investment-friendly licensing for quality and affordability

Kalvin Bahia

Senior Director of Economics,
GSMAi

GSMA Intelligence

gsmaintelligence.com @GSMAi

Mobile Future for the Benefit of Billions

Investment-friendly licensing for quality and affordability

DATE
December 2024

AUTHOR
Kalvin Bahia

What drives spectrum prices?

Demand and willingness to pay (market factors)

But also, spectrum policy…

Very high (reserve) prices and/or fees

Limited supply of spectrum

Not publishing a spectrum roadmap

Award rules (such as auction formats)

GSMA Intelligence

How spectrum prices can impact investment

Does spectrum represent a sunk cost?

- Once incurred, spectrum fees cannot be recovered (especially upfront costs)
- Costs therefore not taken into account in subsequent decisions around investment, network roll-out and pricing
- Governments have often used this argument to justify measuring the success of auctions by revenues obtained

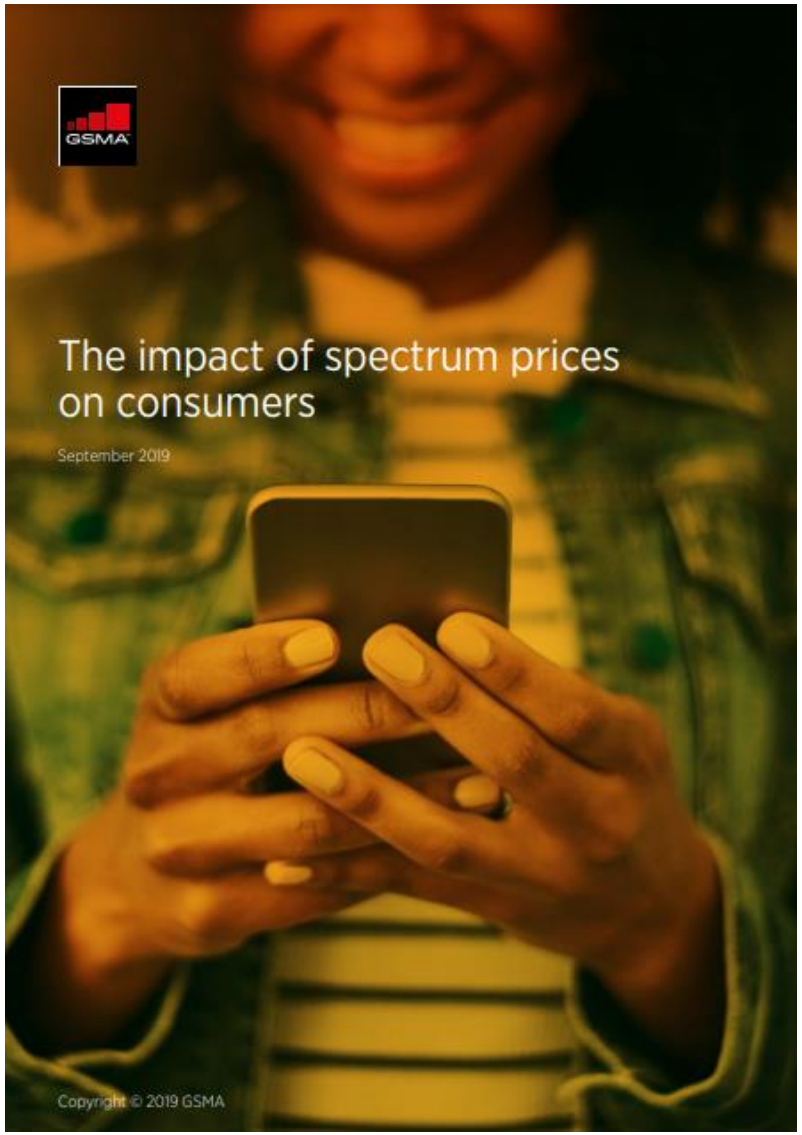
Or does it impact investment & pricing?

- Operators have to recover fixed costs to deliver sufficient returns to investors and lenders
- Spectrum assignments directly impact forward-looking costs and revenues (and therefore commercial strategies)
- Intrinsic difficulty in predicting future developments in the mobile market

THEORY WAS UNCLEAR SO WE ASSESSED THE QUESTION EMPIRICALLY

GSMA Intelligence

Our study answered the question



"…policies that reduce the amount of spectrum available to operators, delay the assignment of spectrum and increase the cost of spectrum all impact two important consumer outcomes - network coverage and quality."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ELSEVIER

Telecommunications Policy

Volume 46, Issue 1, February 2022, 102228

The impact of spectrum assignment policies on consumer welfare

Kalvin Bahia [a 1], Pau Castells [b 1]

Show more

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https://doi.org/10.1016/j.telpol.2021.102228 Get rights and content

GSMA Intelligence

Impact of high spectrum prices

	Developing Countries	Developed Countries
 Network Coverage	**Slower deployment of 4G and 3G networks**	**Slower deployment of 4G networks**
 Network Quality	**Poorer network quality (overall and for 3G)**	**Slower 4G download speeds**

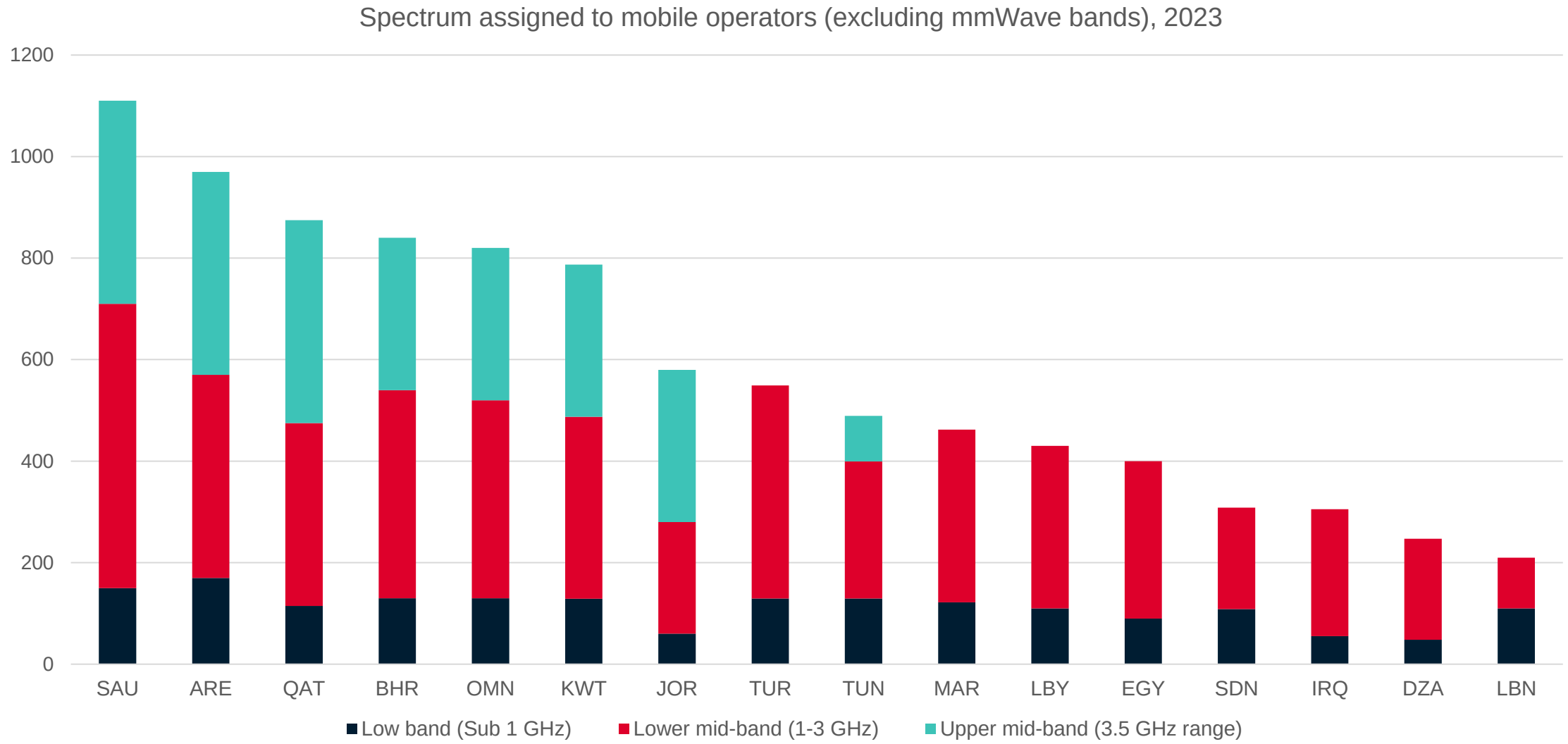
GSMA Intelligence

Impact of spectrum licensing

	All countries
 Network Coverage	• **More licensed spectrum drives higher coverage** • **Early spectrum release drives higher coverage**
 Network Quality	• **More licensed spectrum drives higher network quality**

GSMA Intelligence

Spectrum assignments in Middle East & North Africa

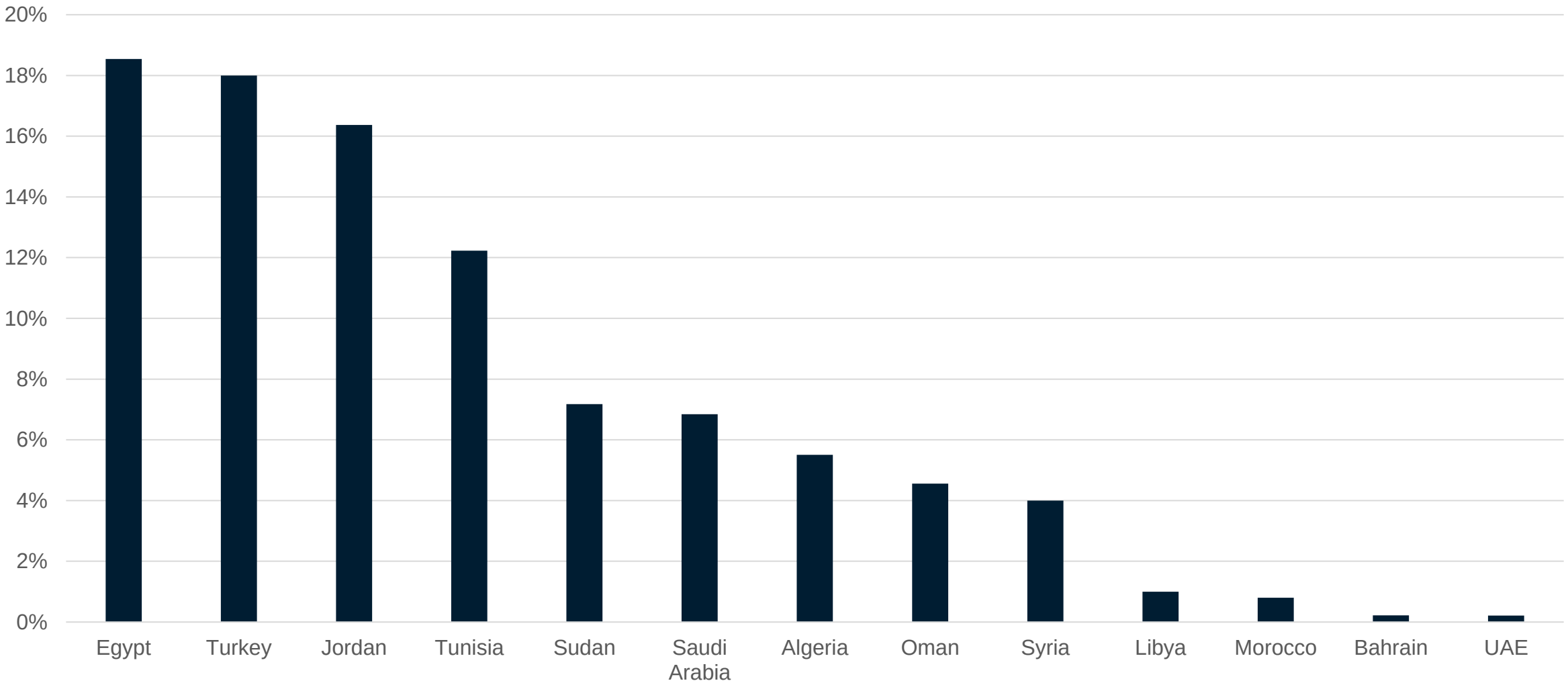


Source: GSMA Intelligence

Results are provisional

GSMA Intelligence

Active Spectrum Costs as a % of Operator Revenue



Source: GSMA Intelligence

Results are provisional

GSMA Intelligence

Implications from our research

1	There is a trade-off between maximising revenues and enabling greater investment and connectivity
2	Auctions can deliver inefficient outcomes when poorly designed (for example if reserve prices are high)
3	Artificially limiting the supply of spectrum, including through set-asides, risks slowing services and inflating prices
4	Spectrum should be released to the market as soon as there is a business case for operators to use it

Investment-friendly licensing for quality and affordability

Dr Mustafa Almahdi

Programme Officer, ITU

Investment-friendly licensing for quality and affordability

Eslam Aboudonia

Public and Regulatory Affairs Director,
Ericsson Egypt

Strategies to bridge the connectivity gap…

Eslam Aboudonia Ericsson Egypt 2024-12

Success of a Strategy depends on its implementation…


VISION
SKILLS
INCENTIVES
RESOURCES
ACTION PLAN
= SUCCESS
X
SKILLS
INCENTIVES
RESOURCES
ACTION PLAN
= CONFUSION
VISION
X
INCENTIVES
RESOURCES
ACTION PLAN
= CONCERN
VISION
SKILLS
X
RESOURCES
ACTION PLAN
= RESISTANCE
VISION
SKILLS
INCENTIVES
X
ACTION PLAN
= FRUSTRATION
VISION
SKILLS
INCENTIVES
RESOURCES
X
= OPTIMISM

Major factors influencing the connectivity gap…

Cost of Coverage

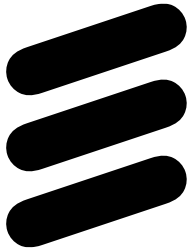
- Availability of Low Bands
  - 800, 700, 600 MHz
- Spectrum Costs that incentivize infrastructure investment
- Cost effective infrastructure that optimize CAPEX and OPEX

Affordability

- Incentivizing market to drive affordable access
- Ensuring long term policy predictability
- Spectrum in mid bands
  - 2.3, 2.6, 3.5 GHz (6GHz)
  - E-band for Transport
- FWA
- Affordable device availability

Geographical Challenges

- Collaborative, Innovative solutions



www.ericsson.com

Investment-friendly licensing for quality and affordability

Cameron Currin

Manager, Aetha Consulting

Mobile spectrum pricing

GSMA – Mobile future for the benefit of billions

Cameron Currin

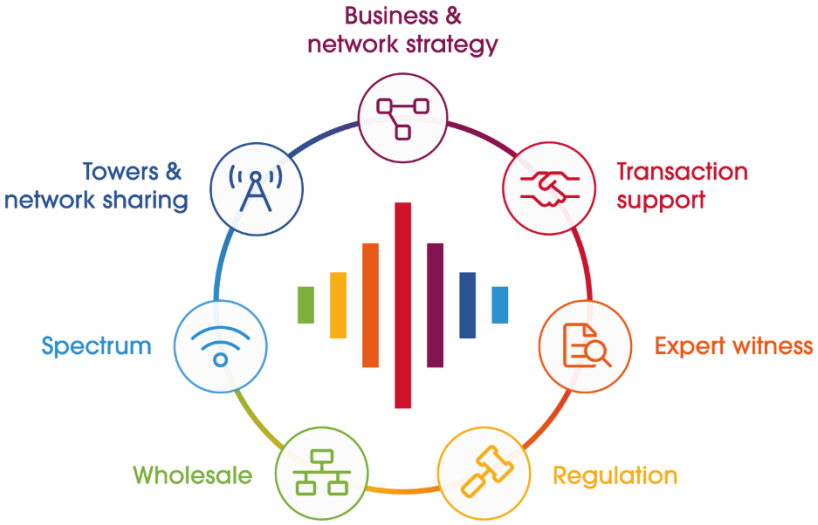
3 December 2024

Introduction

Cameron Currin

- Cameron has **supported regulators to develop spectrum policy and set prices** in e.g. Malaysia, Singapore & Slovenia
- He has also **helped operators to value spectrum and bid in auctions** in e.g. Australia, Romania, Saudi Arabia & the UK

Aetha Consulting



Aetha is a leading global advisor on spectrum

- We have supported regulators to set spectrum prices worldwide, including in Malaysia, Mexico, Singapore, Slovenia and UAE
- We have supported operators in **>100 spectrum auctions**

Pricing of mobile spectrum

Why is mobile spectrum auctioned?

Excess spectrum demand

Exclusive use

Limited number of (large) spectrum users

Spectrum auction

- Objective
- Transparent
- Economically efficient

How to set auction reserve prices?

- Reserve prices should ideally allow for a competitive auction to derive efficient allocations and the market value for spectrum
- Maximising revenues should not typically be a priority
- Therefore, in most cases reserve prices are set at a level which simply guarantees a minimum acceptable return
  - Lower prices are suitable where spectrum's value is unclear

Anticipated competition	Importance of revenue raising	Confidence in spectrum value	Recommended approach
High		High	Minimum return
		Low	Low (non-trivial)
Low	High	High	⚠ Full value
		Low	Minimum return
	Low	High	Minimum return
		Low	Low (non-trivial)

How we value mobile spectrum

Key drivers of spectrum value

Increasing difficulty to quantify

Technical value

Avoidance of incremental network capex and opex, driven by reduced site and equipment requirements

Commercial value

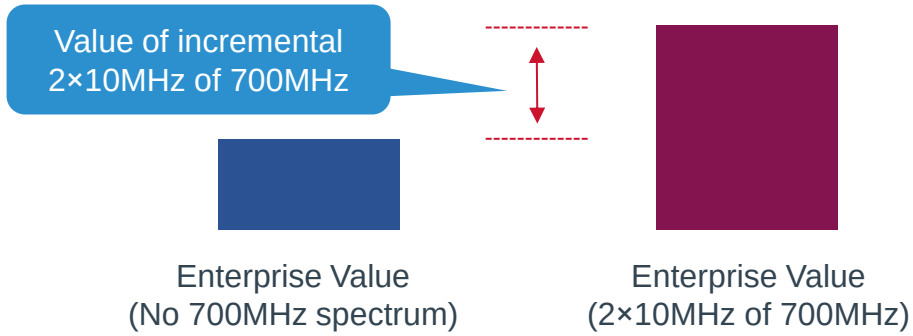
Incremental revenues, gained by securing a spectrum advantage over competitors which differentiates your service

Strategic value

Improving one's strategic position, e.g. by enabling an innovative new service, or protecting market position

How to quantify it

Value of spectrum = Difference in EV between ***two scenarios with different spectrum quantities***

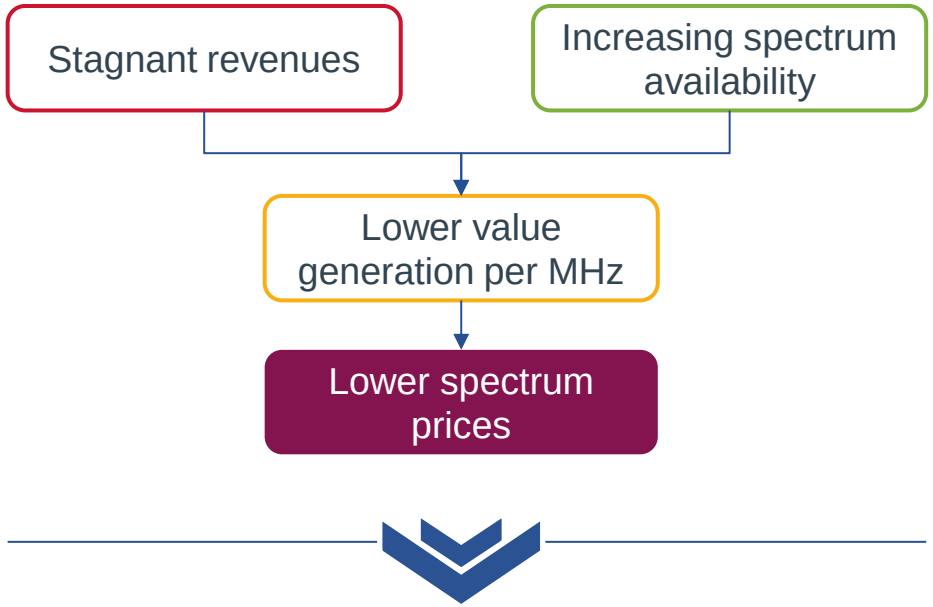


- We build a bottom-up model of an operator's network, modelling in detail those elements which vary with spectrum (RAN costs)
- We use this to estimate future cashflows and **Enterprise Value**

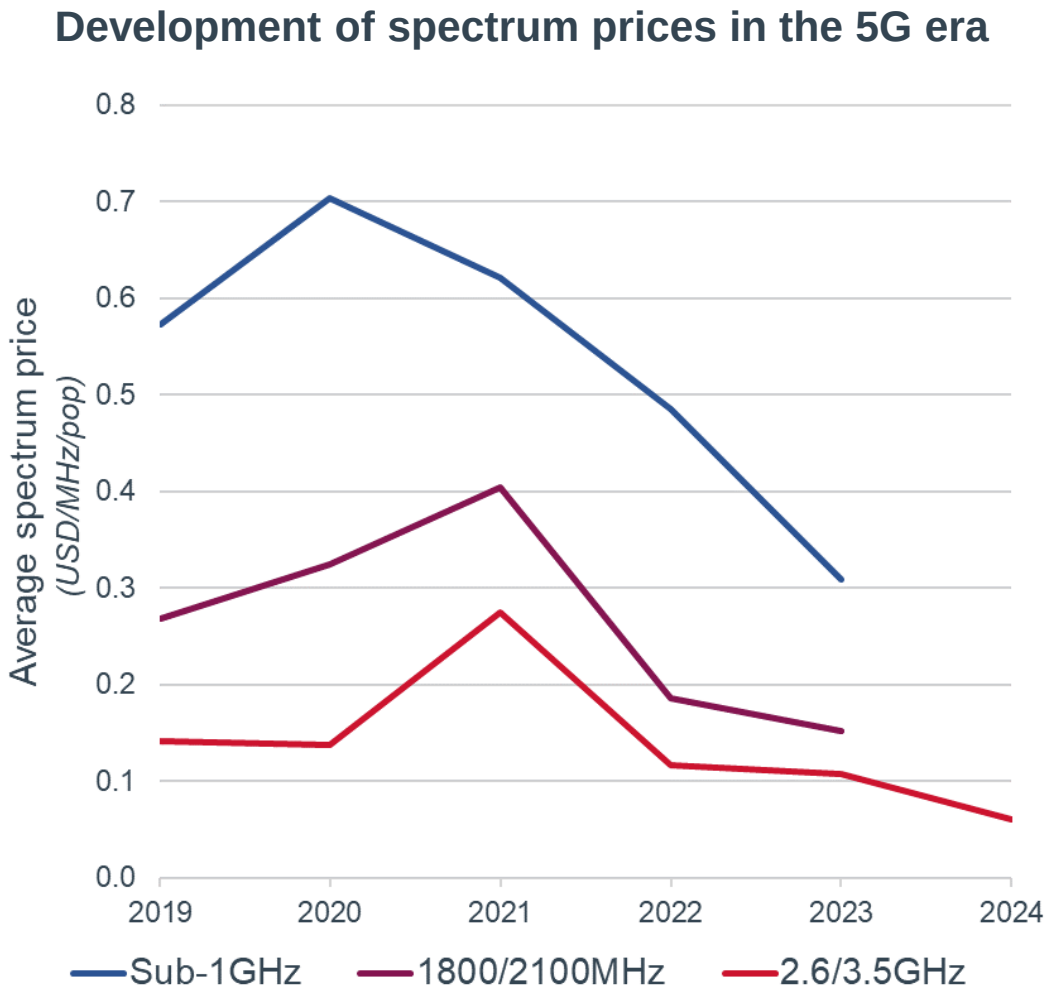
Spectrum value and price are related, but not the same!*

* Operators will typically pay much less than their theoretical value for spectrum in an auction, so as to maximise returns

Trends in mobile spectrum pricing



- Spectrum prices (per MHz) will necessarily fall
- As 5G develops, the value of spectrum is converging
  - The premium for low-frequency spectrum is decreasing
  - Large contiguous blocks of mid-band are increasingly key
- Setting prices based on outdated benchmarks is not appropriate



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Investment-friendly licensing for quality and affordability

Moderator

Kalvin Bahia
GSMAi

Dr Mustafa Almhadi
ITU

Eslam Aboudonia
Ericsson

Cameron Currin
Aetha Consulting

Lunch

13:45-14:45

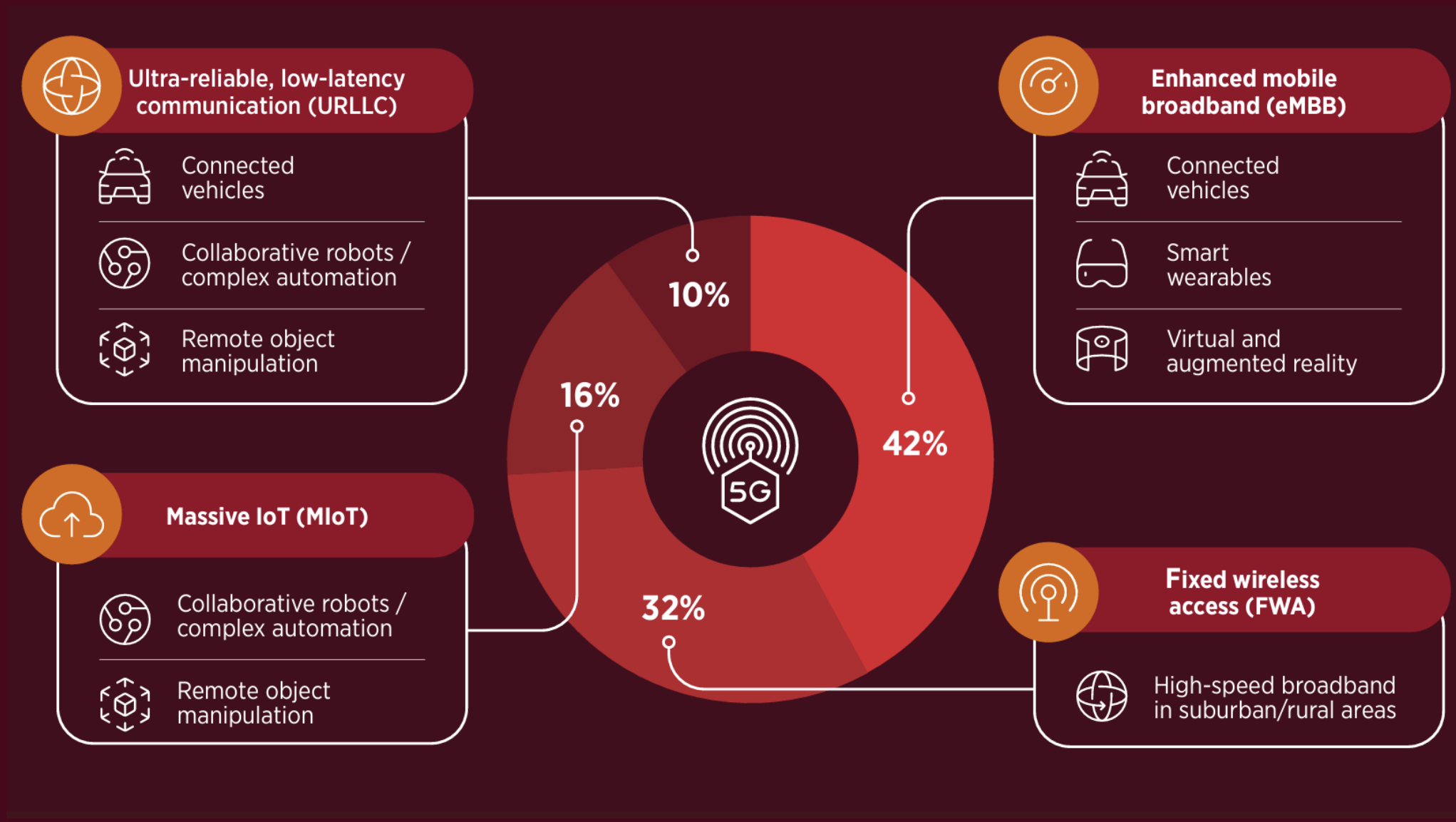
Embracing change via technology neutrality and sunsets

Luiz Felippe Zoghbi

Spectrum Engagement Director,
GSMA

Low
Mid-
High
bands

GSMA

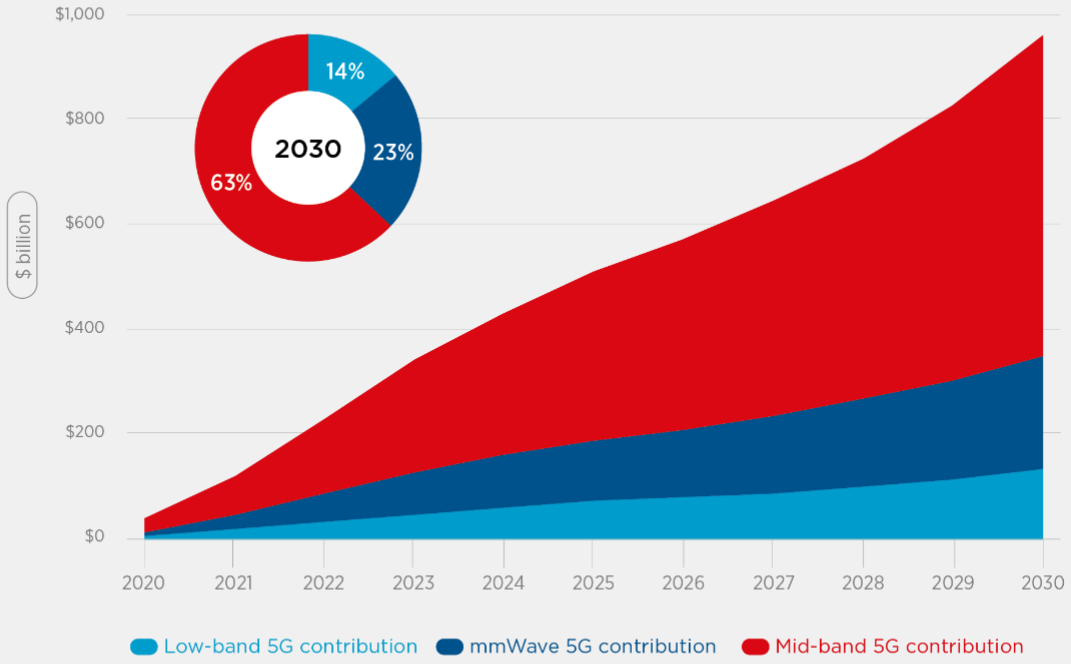

Ultra-reliable, low-latency communication (URLLC)
Connected vehicles
Collaborative robots / complex automation
Remote object manipulation
Enhanced mobile broadband (eMBB)
Connected vehicles
Smart wearables
Virtual and augmented reality
Massive IoT (MIoT)
Collaborative robots / complex automation
Remote object manipulation
Fixed wireless access (FWA)
High-speed broadband in suburban/rural areas
10%
42%
16%
32%
5G

Economic power of mobile

5G

CAN IMPACT GLOBAL ECONOMY IN 2030 BY

$961BN...



... BUT SPECTRUM CONSTRAINTS RESTRICT VALUE

Optimal Scenario

$961bn

0.68% of GDP

Constrained Scenario

$594bn

0.42% of GDP

The Socio-Economic Benefits of Mid-band 5G
GSMA Intelligence 2024

GSMA

Tech Neutral Licences

"Licences that allow the deployment of any standard-based technology which complies with regulations in the licensed frequency band"

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The questions

Why?

When?

How?

The benefits of technology neutrality

Rafarm and repurpose

Lower costs

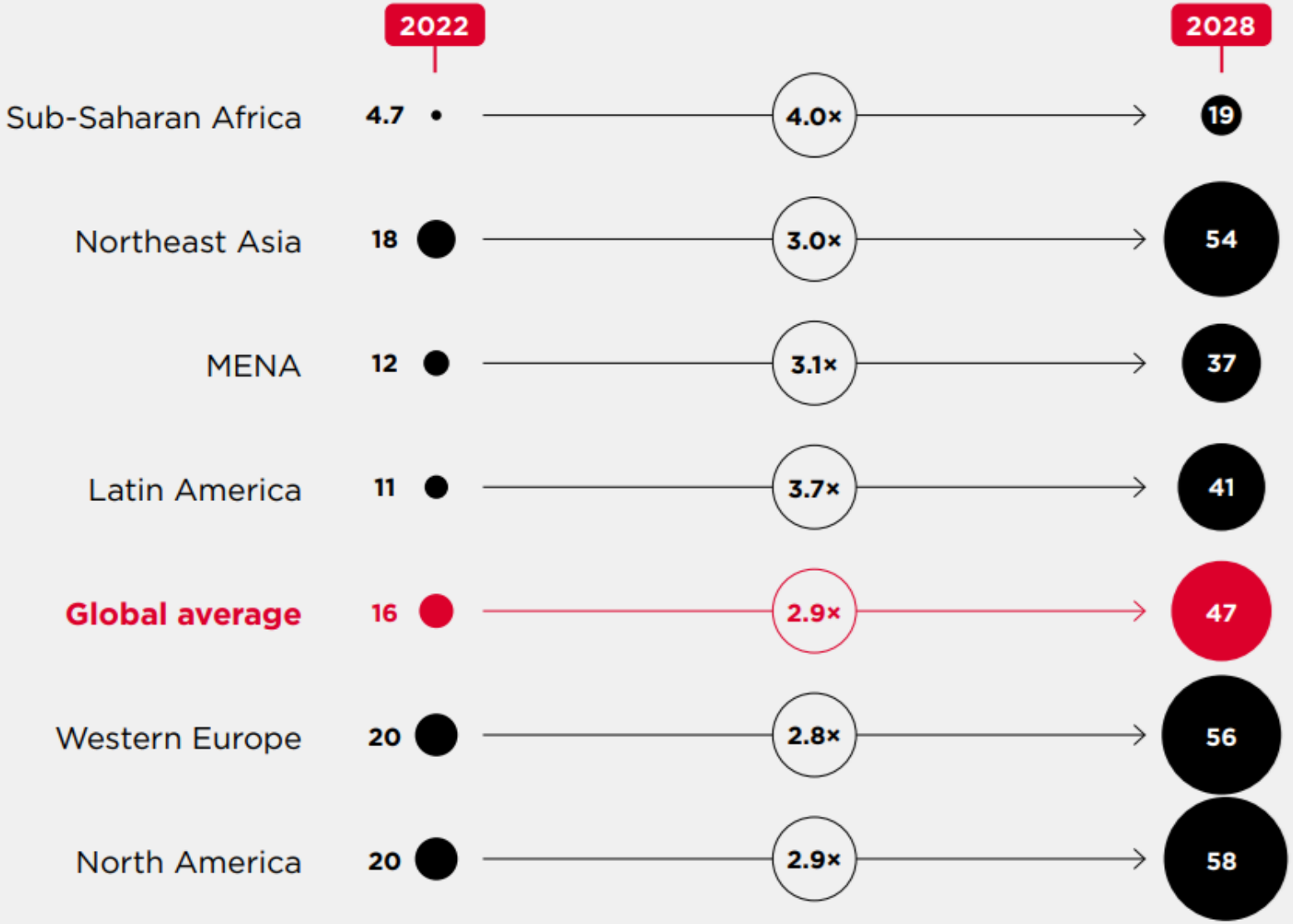
Efficiency

QoS and Reach

GSMA

Traffic growth

GB per month



Source: GSMA Intelligence, based on Ericsson Mobility Report, 2023

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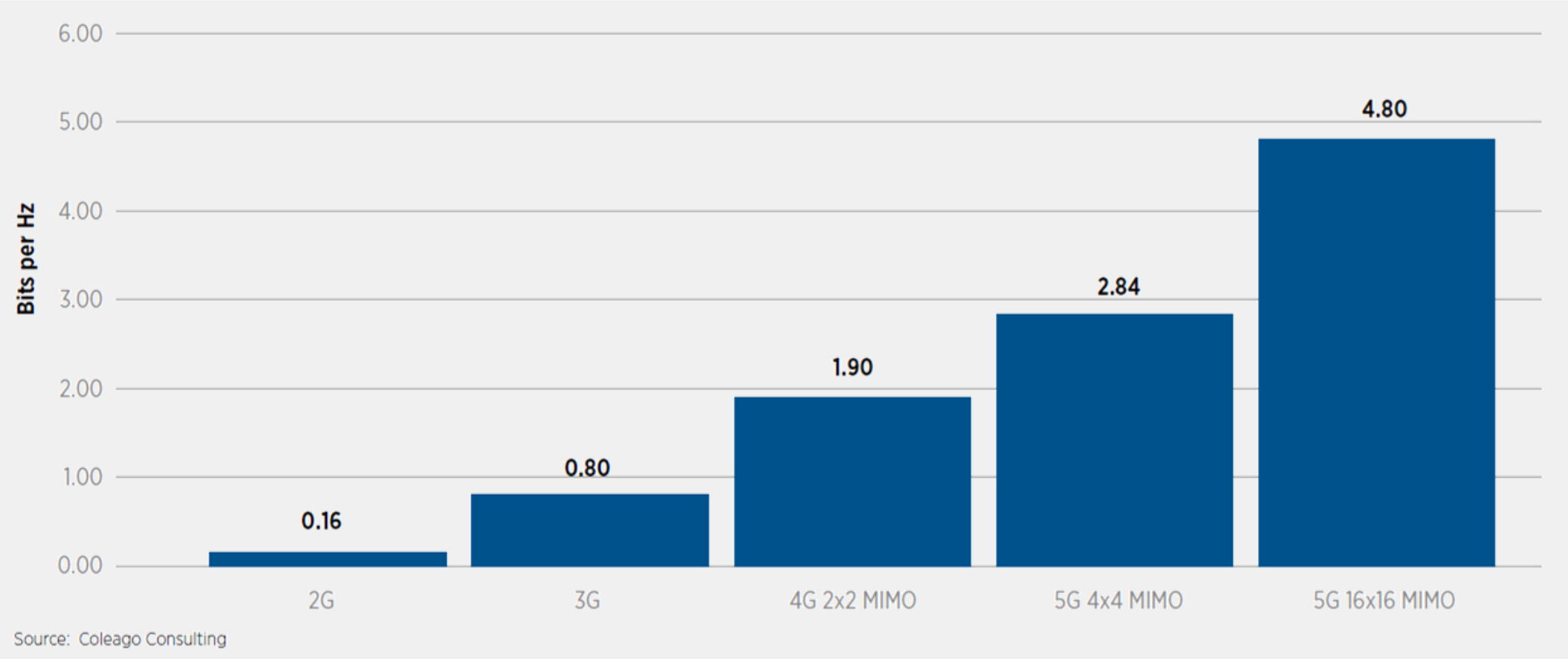
Efficiency



Source: Coleago Consulting

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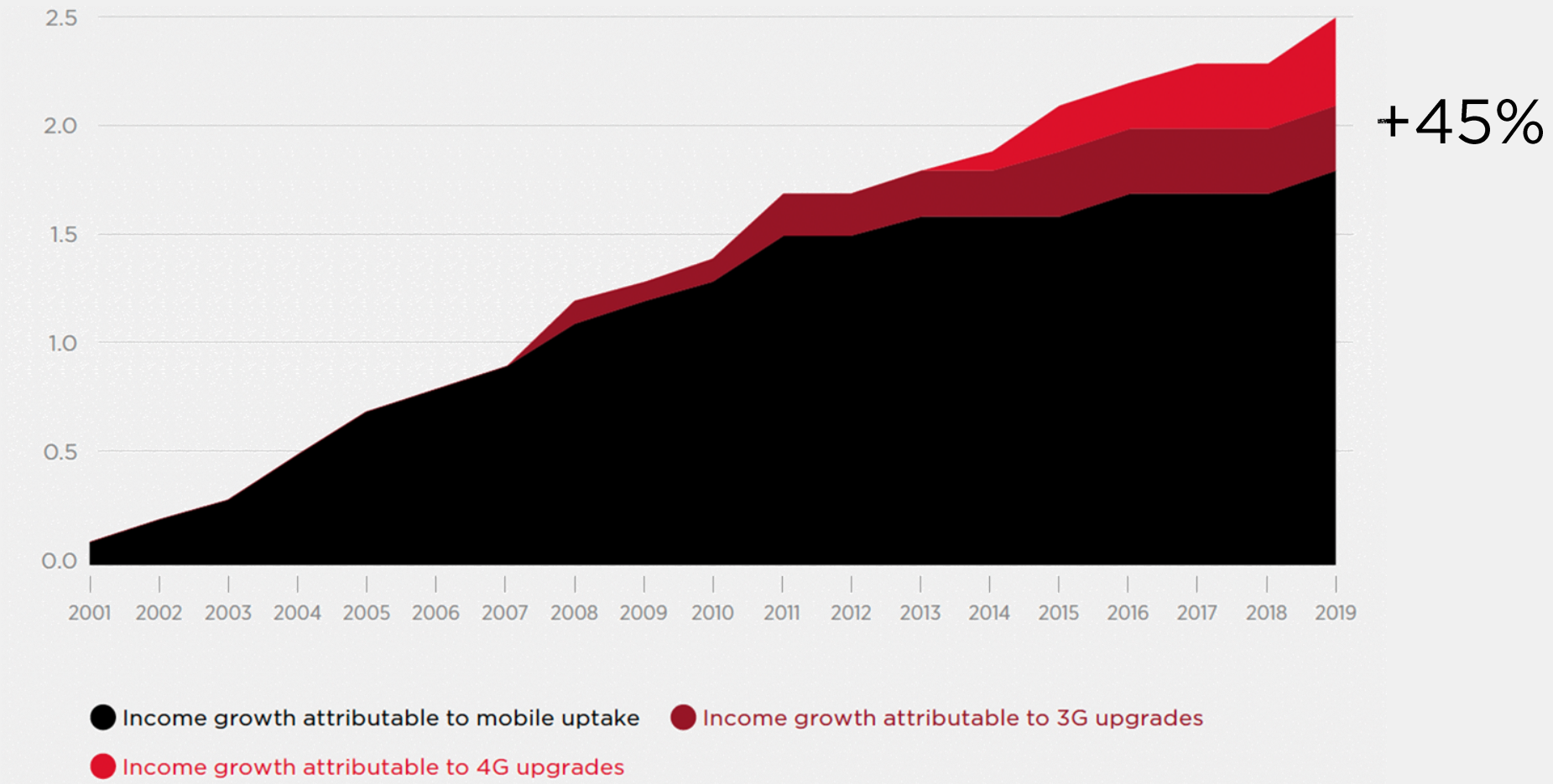
Economic Impact

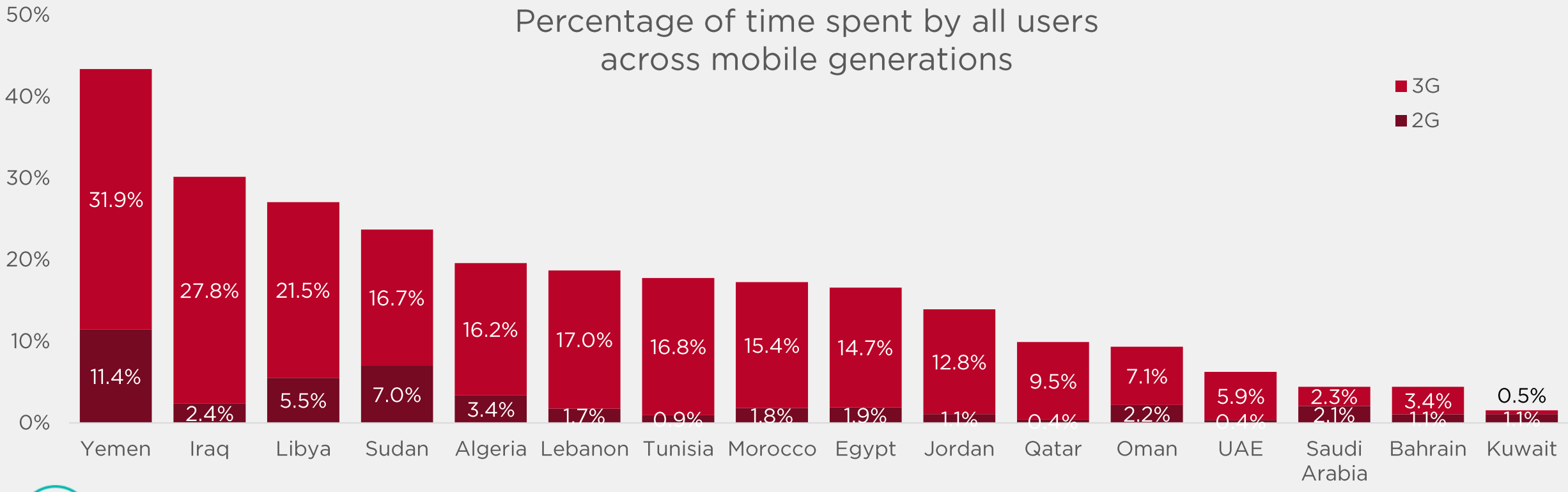


+45%

Source: GSMA Intelligence

GSMA

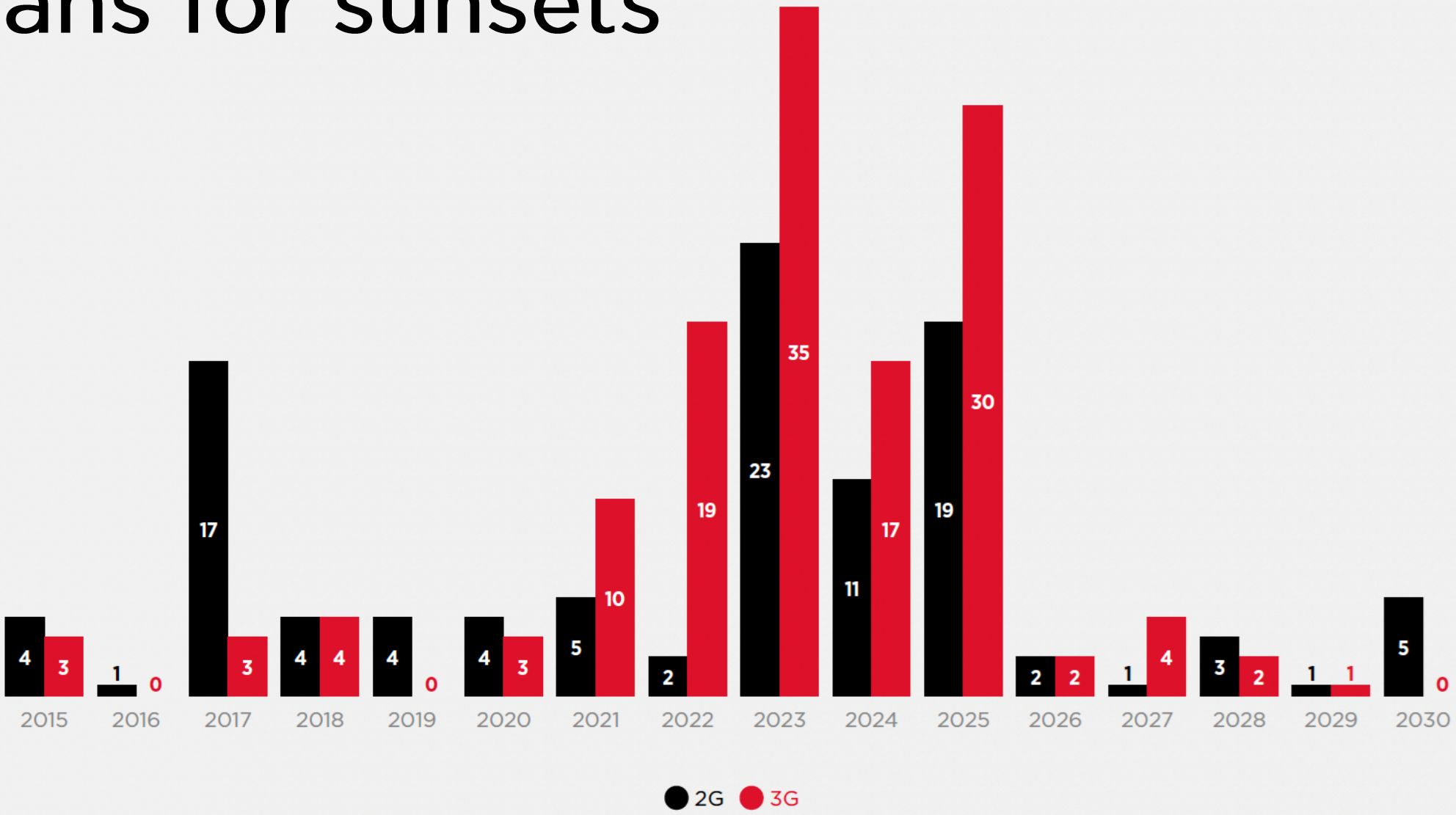
2G and 3G usage in MENA



OPENSIGNAL

GSMA

Plans for sunsets



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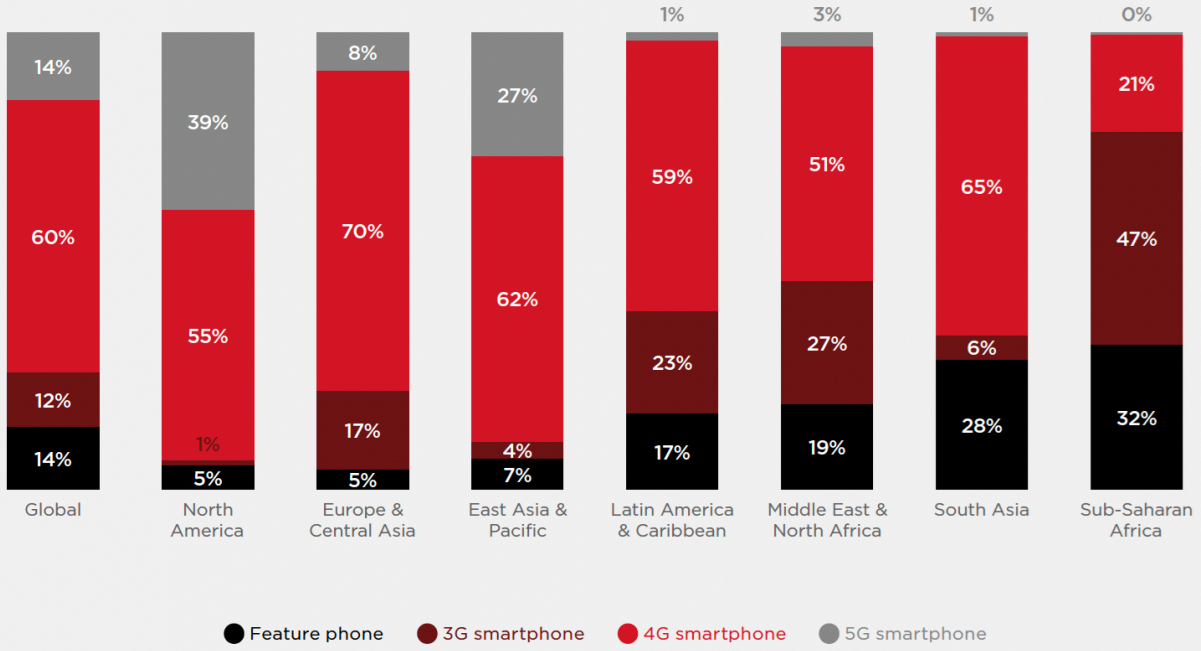
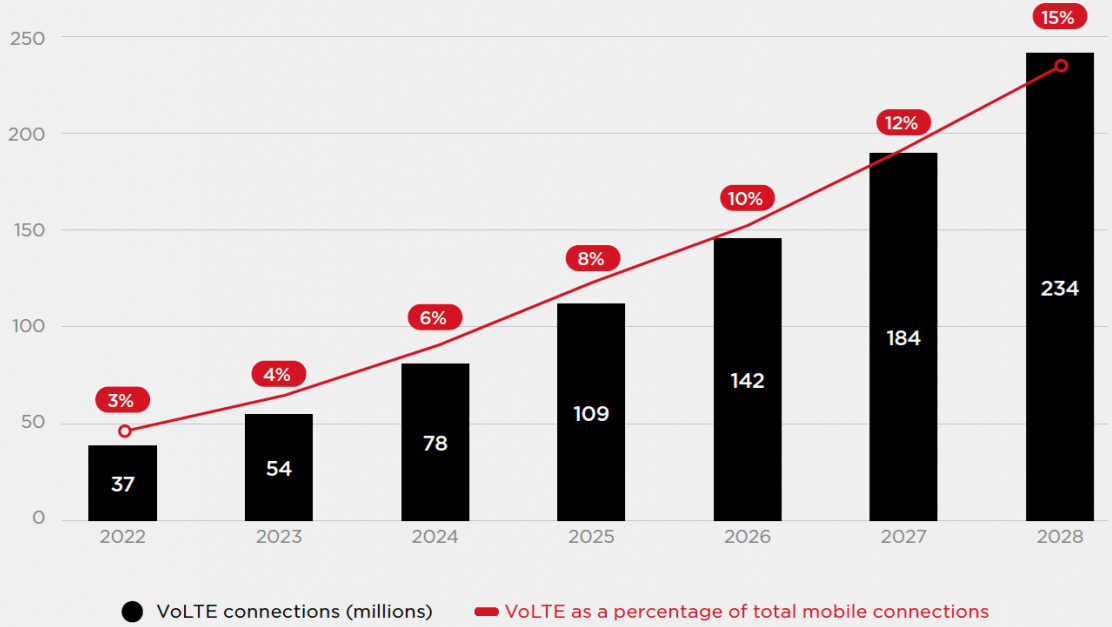
Challenges

Devices



Voice



GSMA

Data usage growth

Efficient use of spectrum

Enhanced bits per Hz

Higher quality to the end user

Significant GDP impact

Technology neutrality

+

Graceful refarming

SPECTRUM for the benefit of billions

Embracing change via technology neutrality and sunsets

Geraldo Neto

Partner, TMG

Embracing change via technology neutrality and sunsets

December 4, 2024

Technology neutrality and digital transformation

Technology neutrality allows flexibility to adapt rapidly to technological changes

Enables innovation in 4G, 5G, and beyond

Encourages economic growth by fostering competition

Sunset is an opportunity to embrace new technologies

Lessons from the analog TV switch-off

- Analog TV sunsets enable spectrum reallocation for advanced wireless services.
- Successful transitions in various countries.
- Public awareness and equipment subsidies ensure smooth transitions.

The 600 MHz band

- Reallocating the 600 MHz band supports enhanced mobile broadband (EMBB) and 5G deployment.
- Ideal for rural connectivity and in-building penetration.
- Critical for bridging the digital divide.

Future of connectivity

Role of new technologies when sunsetting 2G/3G networks

- Mobile operators globally are in the process of switching off their 2G and 3G networks
  - Save on costs and free up bandwidth for 4G and 5G technologies
- Technologies like 5G Broadcast, AI-driven networks, and 6G rely on harmonized spectrum allocation
  - Enhances rural and urban connectivity.
  - Requires international cooperation and standards alignment.
- Efficient spectrum reallocation demands proactive planning and collaboration
  - Engage stakeholders early.
  - Develop clear timelines and funding mechanisms.
  - Align with global best practices.

Focus on a path forward that effectively and collaboratively advance connectivity and digital inclusion

Encourage technical collaboration

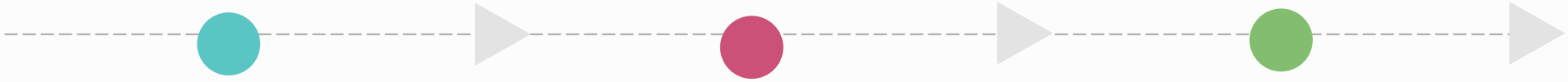
Embrace efficiency and congestion solutions being developed through technical collaboration

Embrace innovative technologies and new business models

Address connectivity gaps through innovative technologies and partnerships that can change the connectivity landscape

Review outdated legacy regulatory requirements

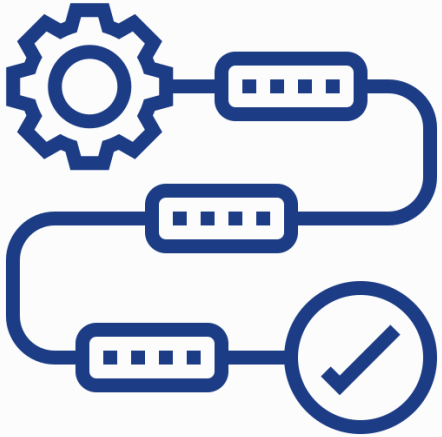
Consider review of outdated regulatory requirements which can streamline regulatory processes and reduce regulatory burdens



Governments can advance connectivity by streamlining regulations and supporting innovative technologies

- **Modernize regulatory frameworks:** Replace outdated legacy regulations with market-driven, agile measures that better support innovation and growth.
- **Simplify regulatory processes:** Streamline processes to reduce administrative burdens on telecom operators, facilitating quicker deployment of new technologies.
- **Optimize spectrum management:** Lower spectrum costs and introduce more flexible assignment methods to ensure efficient use and broader access to connectivity solutions.

- **Reduce taxes and costs:** Cut excessive taxes and administrative fees that hinder investment and slow down innovation in the telecom sector.
- **Eliminate unnecessary requirements:** Remove outdated reporting and data collection mandates that are resource-intensive and may no longer be relevant.
- **Facilitate market entry:** Create a conducive environment for innovative connectivity solutions by easing entry barriers and fostering public-private partnerships.



Geraldo Neto geraldo@tmgtelecom.com

Embracing change via technology neutrality and sunsets

Moderator

Luiz Felippe Zoghbi
GSMA

Geraldo Neto
TMG

Aya Abouzaid Jalaleldeen
TPRA, Sudan

Shahir Boshra
Cordon Electronics

Break

15:45-16:00

Future-proof policies for emerging technologies

Kamal Tamawa

Spectrum Director, SSA
GSMA

Future-proof policies for emerging technologies

Amr Ashour

Senior Manager of Market Access, MEA,
Eutelsat OneWeb

EUTELSAT GROUP

GSMA Workshop “Mobile Future for the Benefits of Billions”
Egypt – Cairo, 4 December 2024

ABOUT EUTELSAT GROUP

DELIVERING SUSTAINABLE CONNECTIVITY GLOBALLY

Our mission

- To be the most trusted partner for global satellite connectivity

Our DNA

- More than 40 years of experience in global satellite industry
- First satellite operator with an integrated GEO-LEO infrastructure
- Delivering video broadcasting, satellite newsgathering, broadband services, data connectivity, connecting airplanes and ships, enabling mission-critical government and NGO communications
- Highest quality of service through technological performance, market expertise and innovation
- Committed to promoting all facets of sustainable development across our business activities
- Leveraging in-orbit resources to help bridge the digital divide

Our purpose - Connecting your world

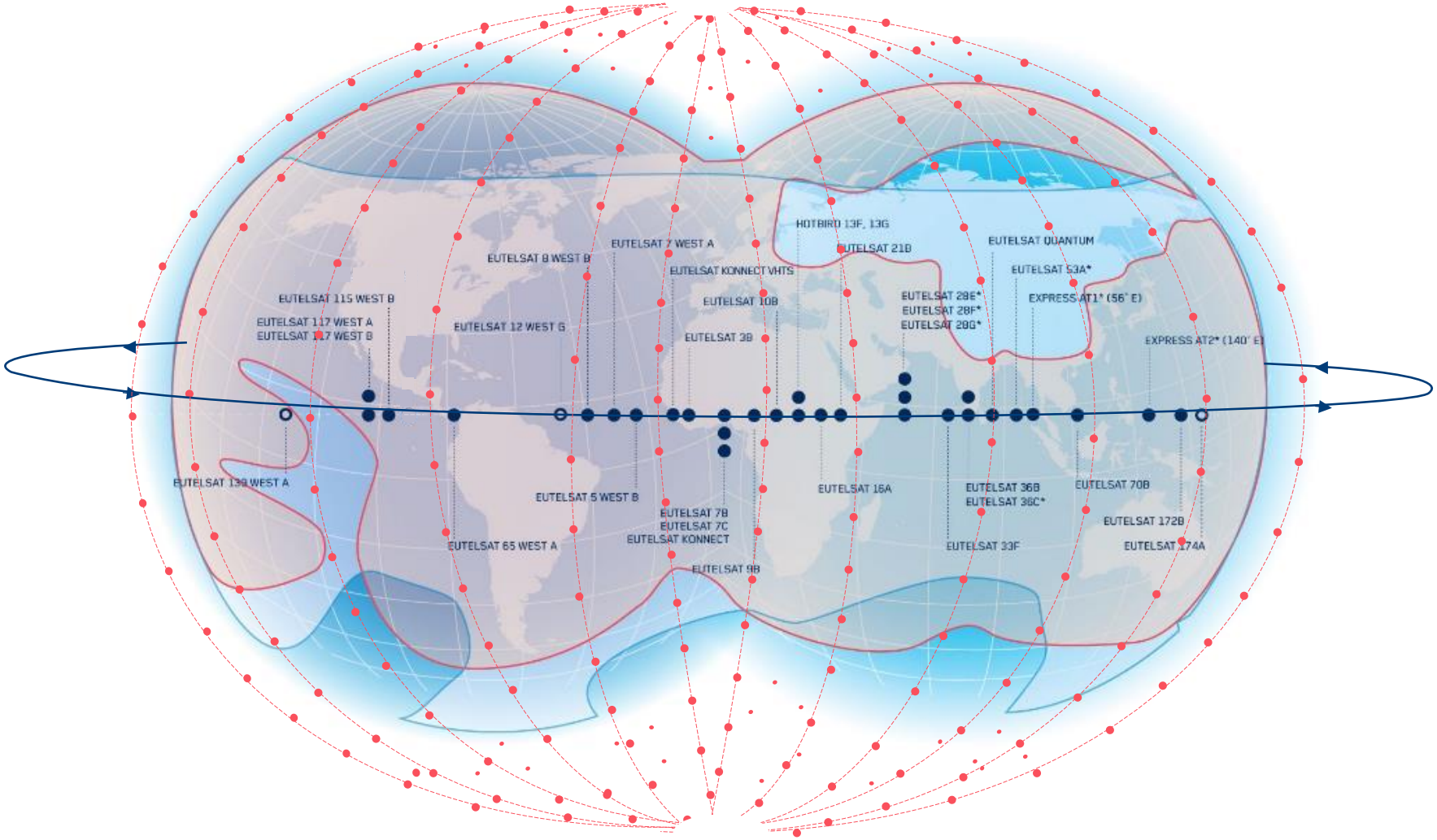
TWO MARKET-FOCUSED BUSINESS UNITS

Formed from the merger between Eutelsat and OneWeb in 2023

- Delivering content to terrestrial networks and Direct-to-Home reception
- Enriching the viewing experience with satellite multiscreen and revolutionary FTA services
- Innovative next-gen. content distribution

- World's first GEO+LEO One-Stop-Shop
- Mobile, Fixed and Government connectivity services
- Flexible, resilient and low latency
- Fully global services

A UNIQUE CONNECTIVITY OFFER: GEO+LEO FOR RELIABLE GLOBAL PERFORMANCE



The Eutelsat OneWeb fleet

- GEO
- LEO

- Stable orbit
- Inclined orbit
- Capacity on third-party satellites
- Polar orbit

UNDER REDEPLOYMENT

EUTELSAT HOTBIRD 13E
EUTELSAT 33E

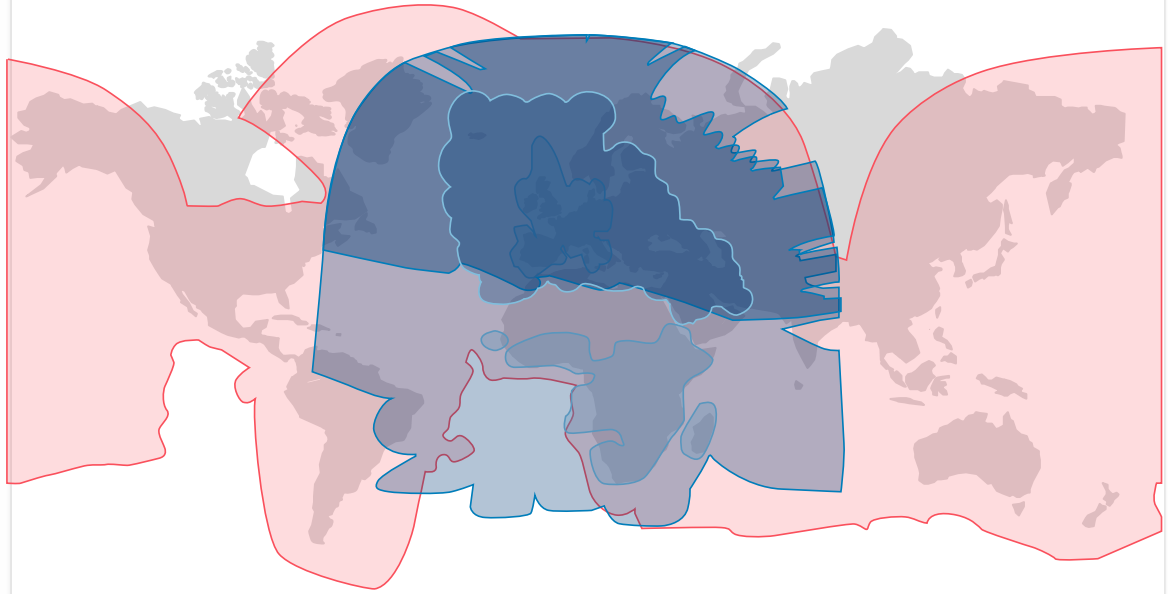
FUTURE SATELLITES

FLEXSAT
Launch #20 LEO sats

THE INTEGRATION OF TWO SYSTEMS

Maximise performance & reach

GEO

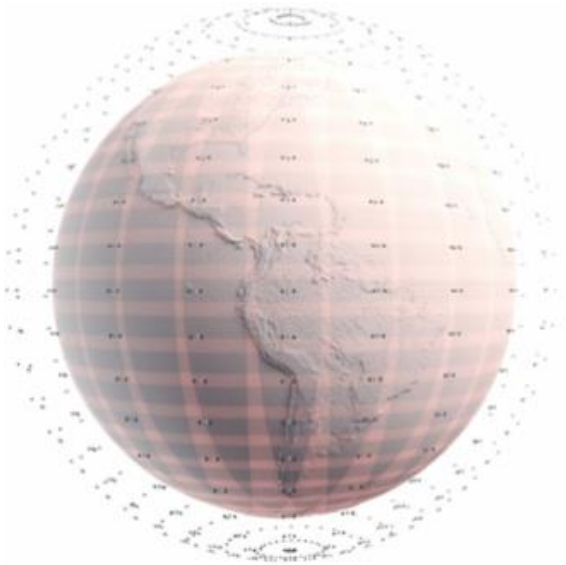


BANDWIDTH

RESILIENCY

RELIABILITY

LEO



Constellation on 12 orbital planes that range in altitude from 1,175km to 1,219km (~745 mi) to prevent inter-plane collisions

Premium spectrum Ku- and Ka-band rights

3.5 GHz of globally-harmonized spectrum

Innovative satellites design with >7 Gbps per satellite

UBIQUITOUS COVERAGE

LATENCY

PERFORMANCE

GEO & LEO SERVICE PORTFOLIO UNIQUE IN THE INDUSTRY

CONNECTIVITY SOLUTIONS

CONNECTIVITY WHEN AND WHERE YOU NEED IT MOST

CUSTOMER-FOCUSED DIFFERENTIATORS

INFRASTRUCTURE

- Unique ecosystem
- Partner network
- Multi-orbit offering
- High capacity
- Low latency

HARDWARE & PLANS

- Service level agreements
- Unique UT portfolio
- Flexible plans and features

APPLICATIONS

- Reliable, secure
- Cyber and GPS resilience
- Fixed / Mobility

CONNECTIVITY FOR EVERY TYPE OF APPLICATION

FIXED

MOBILITY

LAND

SEA

AIR

THE MOST COMPREHENSIVE RANGE OF UTS IN OUR MARKETS

BACKHAUL

ENTERPRISE

UTILITIES

MARITIME

GOVERNMENT

AVIATION

SUPPORTING A GLOBAL NETWORK TO INCREASE VALUE

WE SUCCEED TOGETHER

ADVANTAGES

Retain complete ownership of the relationship and interaction with end customers

Create your own products with Eutelsat OneWeb services fully integrated for your end customers

Real margin for Distribution Partners and incentive for long contracts to commit capacity and ensure predictability of costs


eutelsat GROUP
Connecting your world changes everything
CONNECT WITH US
www.eutelsat.com

Future-proof policies for emerging technologies

Ahmed Tawfik

MEA CTO and Head of Technology,
Nokia Mobile Networks

Shaping the 6G future
From vision to action

December 2024

The push and pull trends point to the need for 6G

Trends and challenges

Demand for higher network performance

The vastly growing device ecosystem

The surging power of AI and emergence of the API economy

How 6G can address them

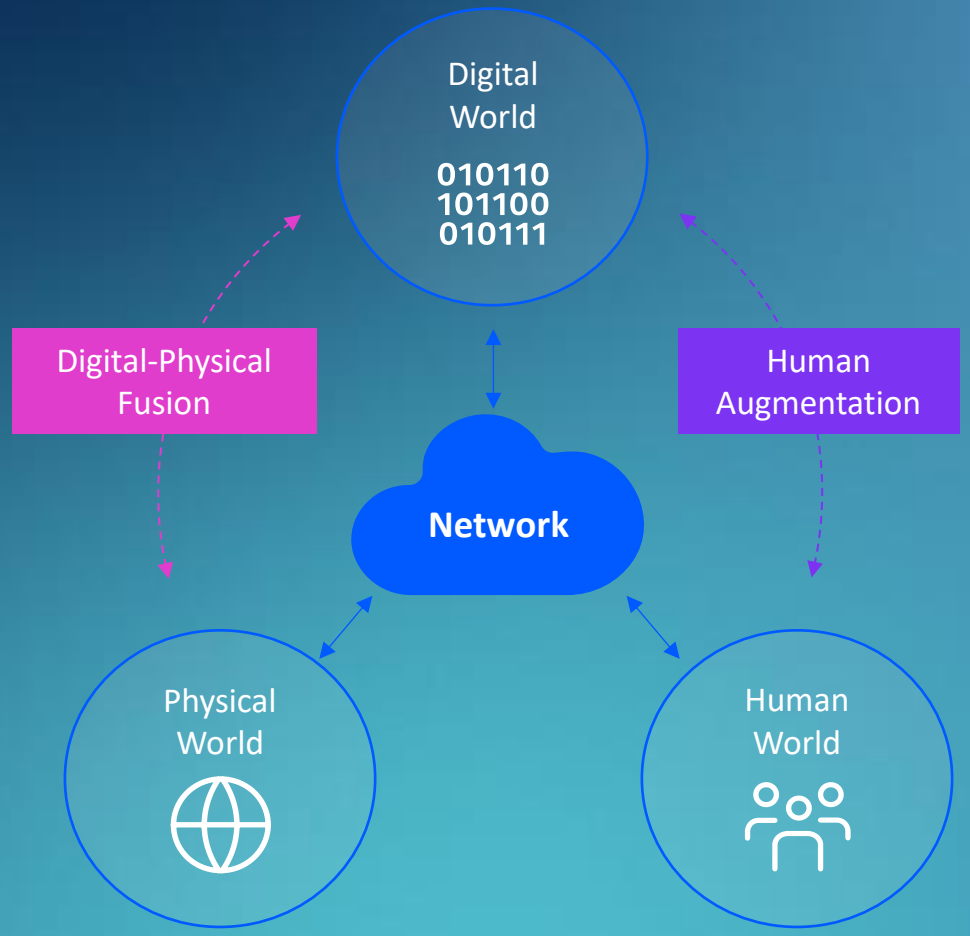
Design principles for 6G

Sustainable
10X capacity increase with 50% power reduction, compared to 5G

Resilient & Secure
Increasing security and privacy risks require higher levels of control

Digital inclusive
Aims to address accessibility, affordability and consumability

The 6G era will be defined by digital-physical fusion and human augmentation



Digital-Physical Fusion

Dynamic, network-connected representations of real-world things in the digital world

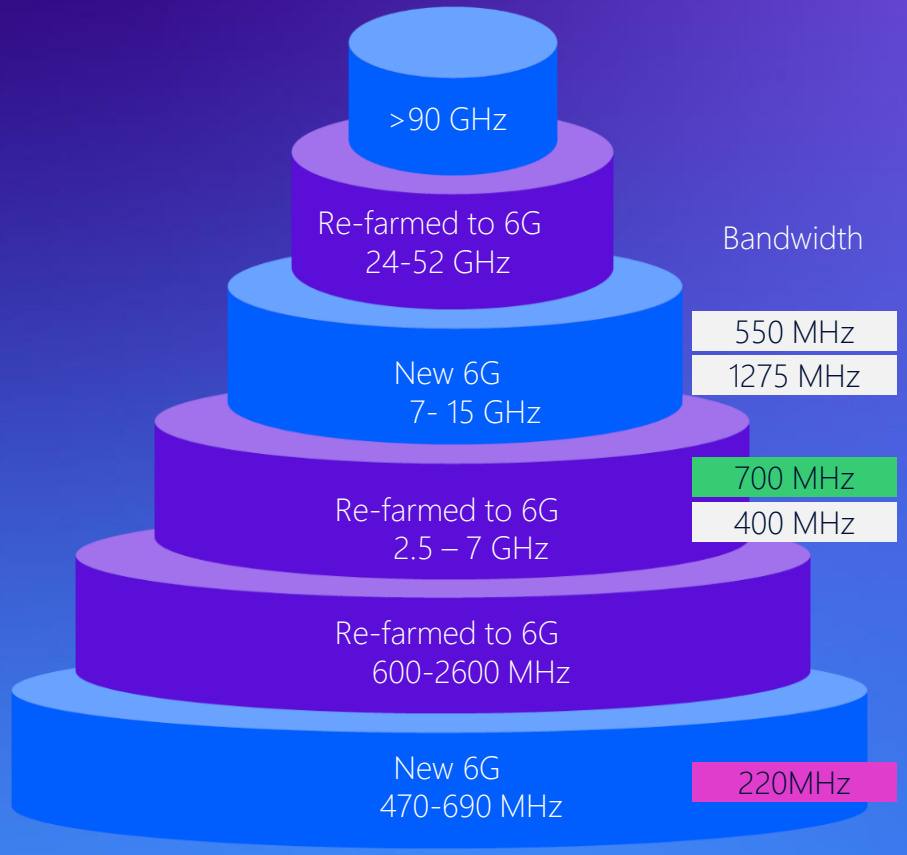
Allows the physical world to be replicated, simulated and automated within the digital world - opening doors to a wealth of new possibilities benefiting humanity.

Human Augmentation

Extensions that enable people to interact with and within the digital world

Evolves the digital world from a source of two-dimensional experiences and information, to a focal point of immersive and productive interaction

WRC-23 identified good spectrum blocks to be studied for 6G capacity and coverage



ITUWRC DUBAI 2023
20 November – 15 December

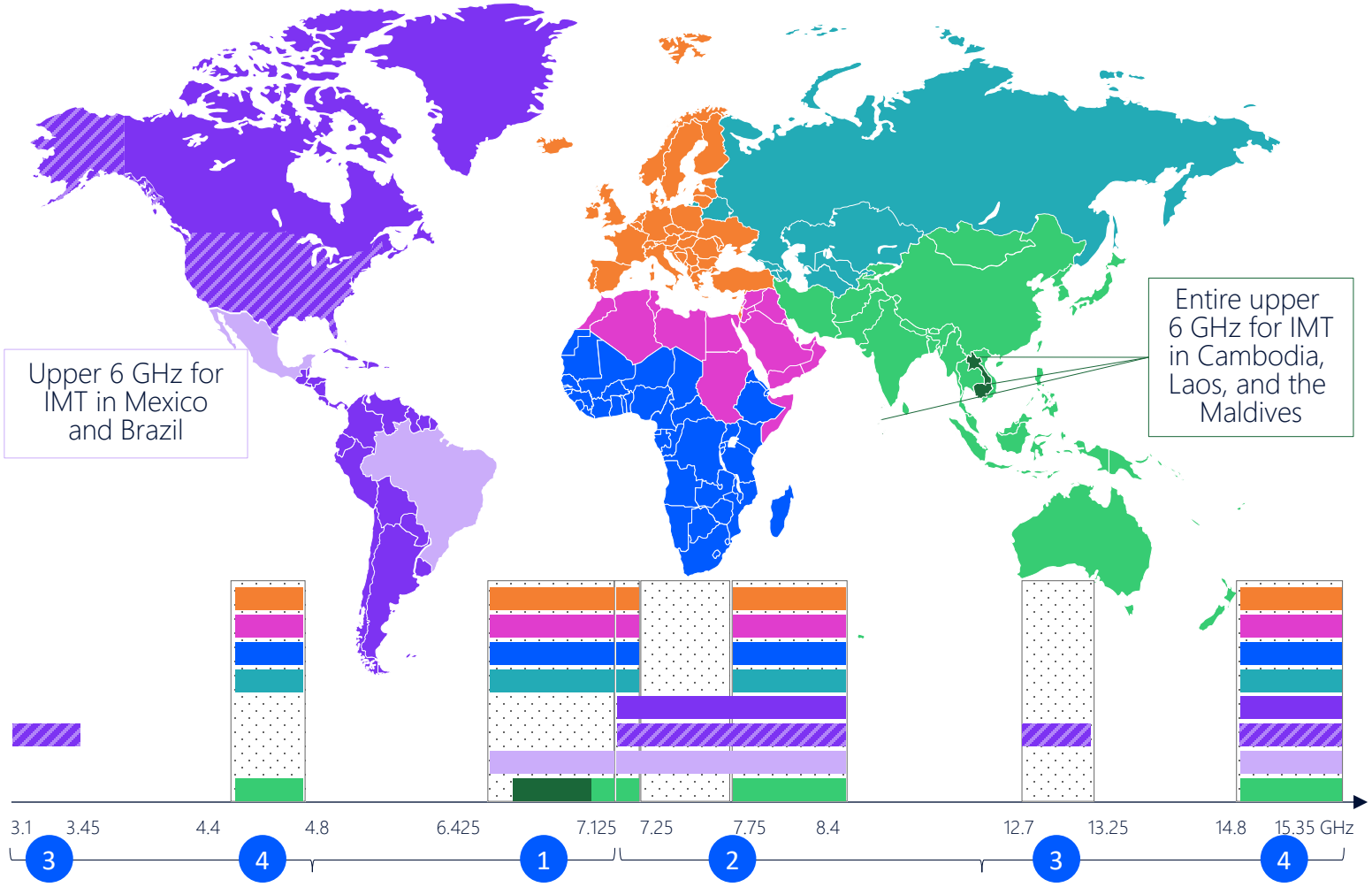
Bandwidth		
550 MHz	14.800 GHz - 15.350 GHz	Wide area capacity and data rate boost
1275 MHz	7.125 GHz - 8.400 GHz	
700 MHz	6.425 GHz -7.125 GHz	Expansion of existing 5G mid-bands
400 MHz	**4.4 GHz - 4.8 GHz**	
220MHz	**470 MHz - 690 MHz**	Extreme coverage at low bands

Note: only part of these spectrum blocks will be possible in each geographical regions

WRC-23 IMT identification
WRC-27 approved to study for IMT
WRC-31 subject for discussion

IMT: International Mobile Telecommunications

Mid-band spectrum roadmap towards 6G



1. The potential shared use of the Upper 6 GHz band with Wi-Fi could reduce the value of the band for 5G-Adv/6G deployments

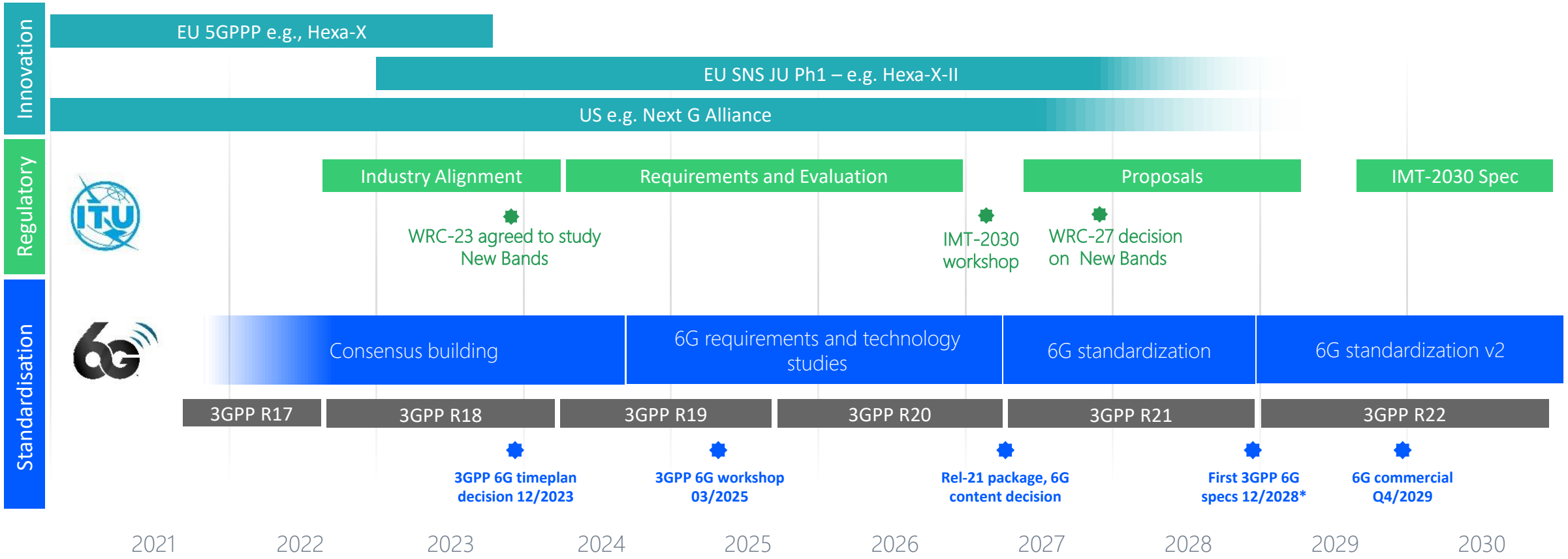
2. 7.125-8.4 GHz has great potential to expand mid-band spectrum while enabling macro deployment for increased capacity and coverage

3. In the US, the extension of the C-band towards 3.1 GHz as well as using the 12.7 GHz band will spur additional 6G growth, with the potential to expand the ecosystem beyond US boundaries

4. The 14GHz band is less attractive as it has characteristics closer to mmWave. The 4GHz band is challenging due to existing incumbents (e.g., military use in many countries).

6G success depends on a global, unified approach

Regulatory, innovation and standardization timelines must be brought into harmony



*3GPP plenary#102 alignment in December 2023


NOKIA

Future-proof policies for emerging technologies

Moderator

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Closing and Vote of Thanks