



INDEPENDENT COMMUNICATIONS
AUTHORITY OF SOUTH AFRICA

5G and beyond

The role of regulation

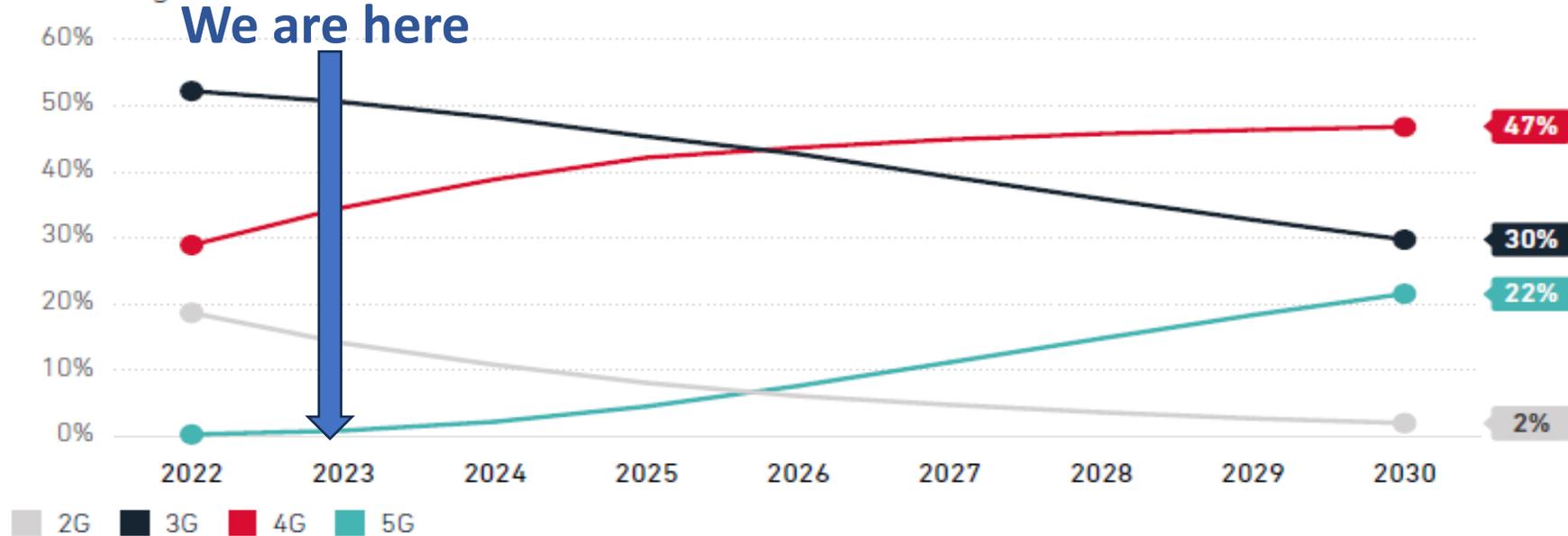
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The views expressed in this
presentation do not necessarily
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Status of IMT in Africa (2G → 3G → 4G → 5G (?))

Mobile adoption by technology in Africa
Percentage of total connections



Mobile subscribers (2022) = 490m (43% pop)

Coverage gap = 15% - Usage gap = 59%

60% of subscribers use mobile Internet

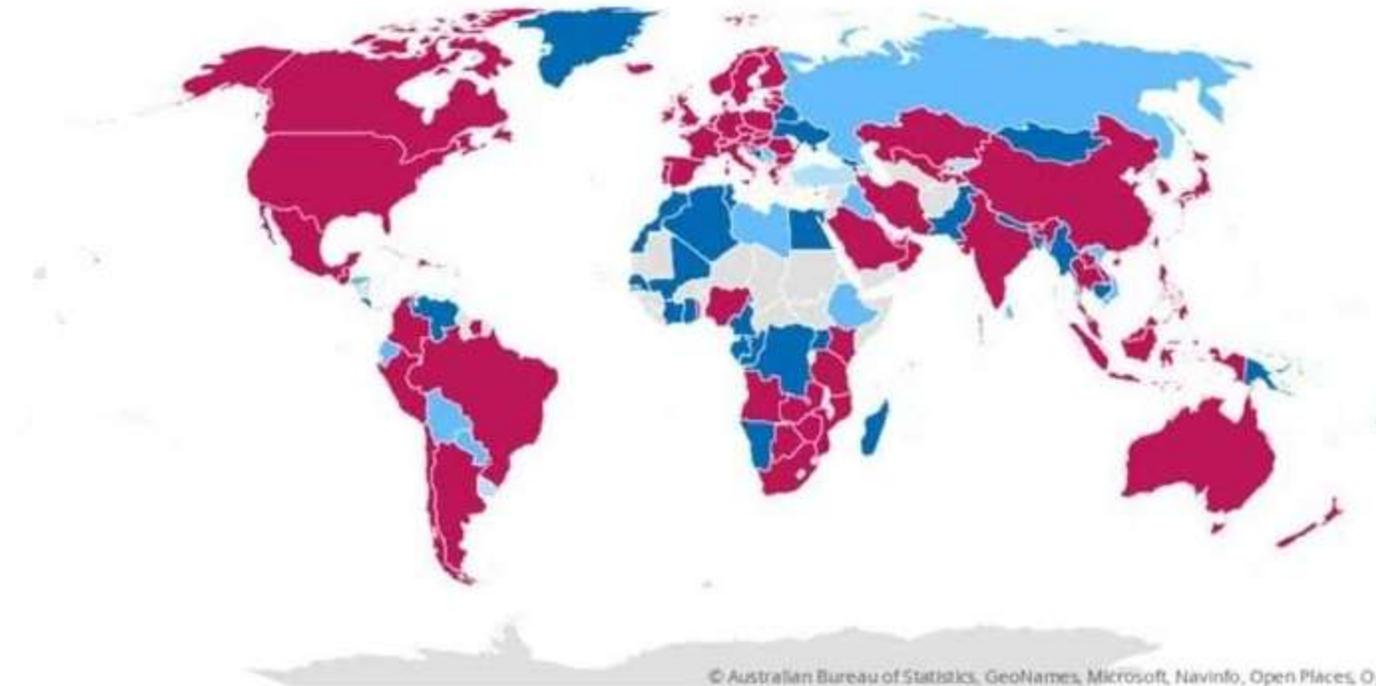
51% of subscribers have smartphones

Smartphones = 49% of subscribers

5G in Deployments Worldwide

172 Countries Now Investing in 5G Networks

- 5G deployed in network, services launched
- Planning/evaluating/testing/trialling
- Deploying/deployed, precommercial
- 5G deployed in network, soft launch



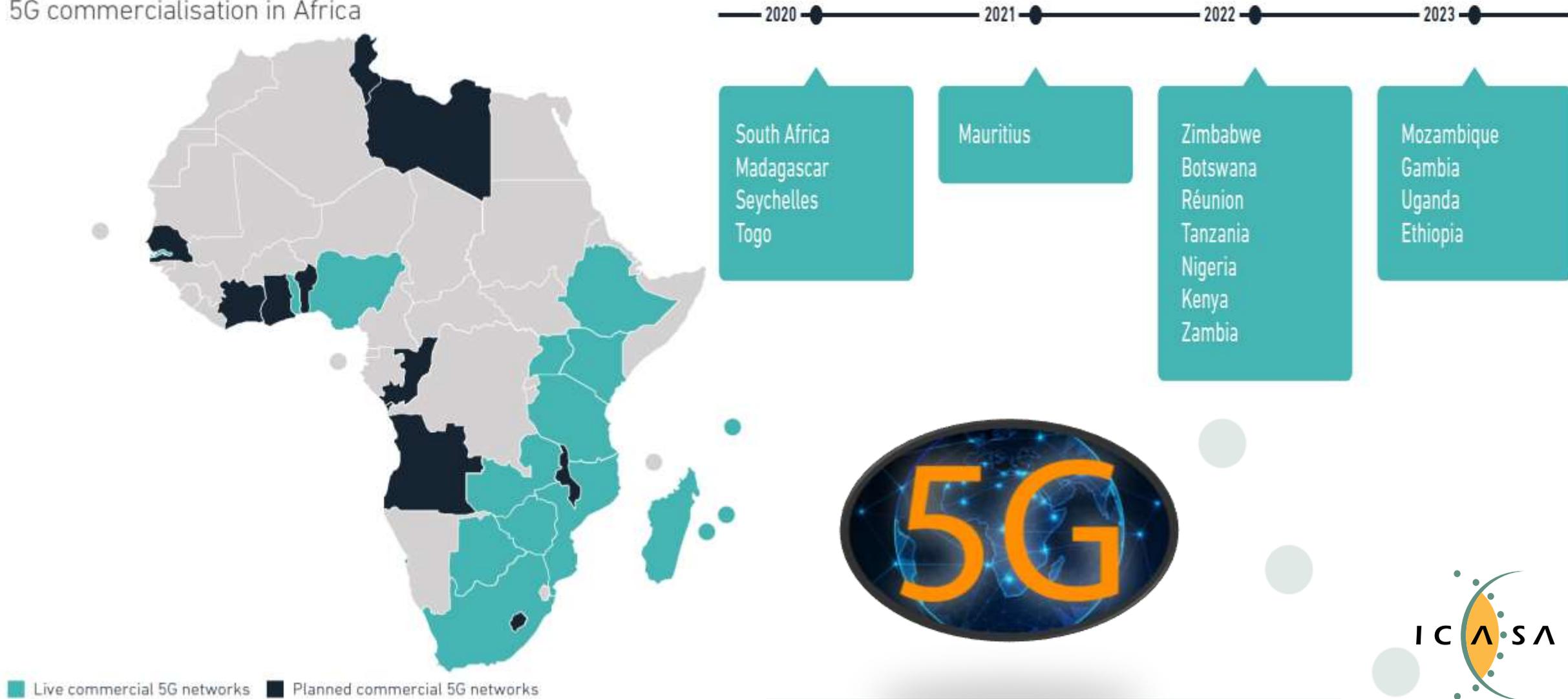
2024:
308 operators
118 countries

- 113 countries have a commercial deployment of 5G, with a further 59 investing in 5G



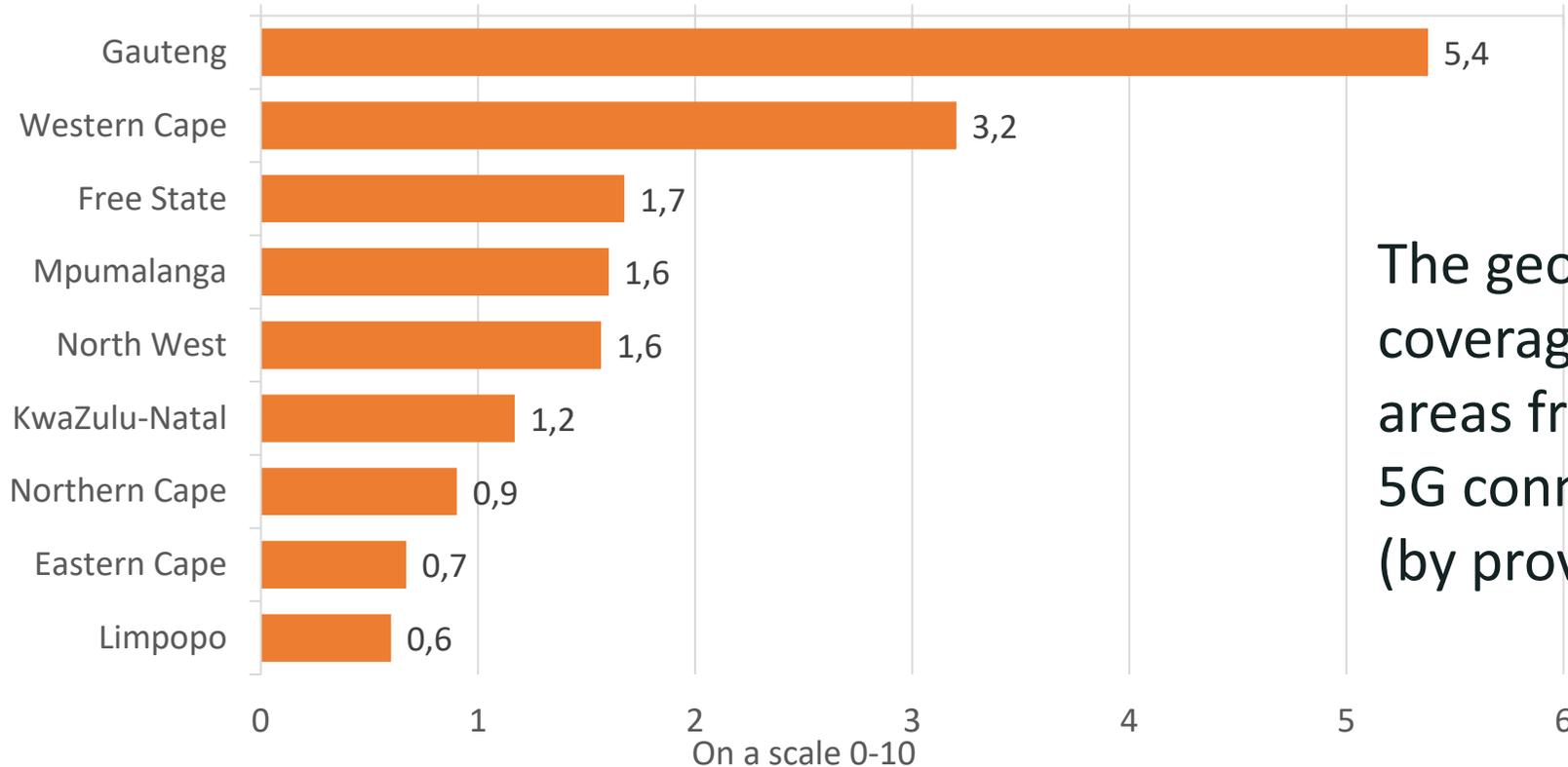
5G in Deployments Africa

5G commercialisation in Africa



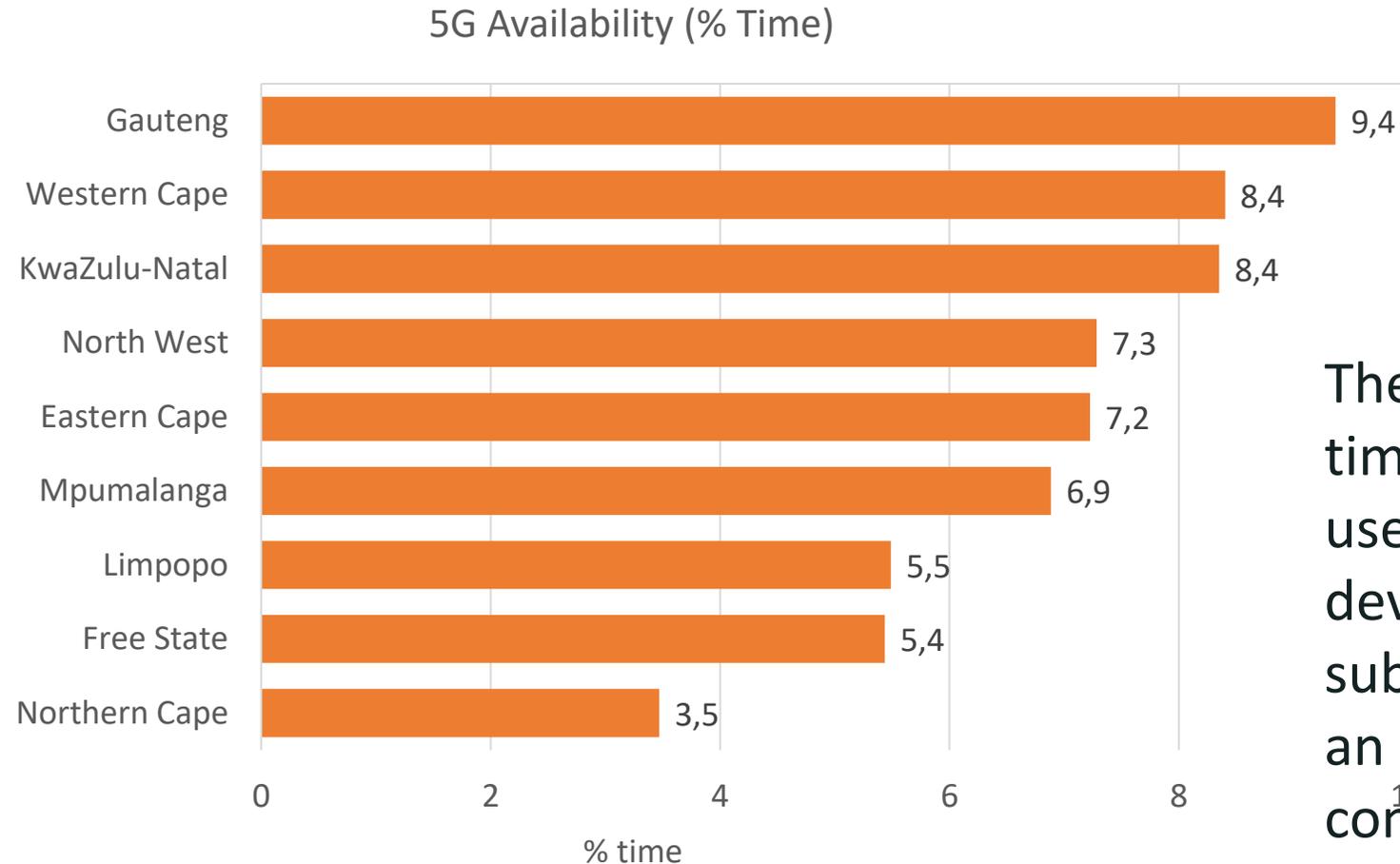
5G in South Africa: Coverage Experience

5G Coverage Experience



The geographic coverage of populated areas from 5G users on 5G connections only (by province)

5G in South Africa: Availability



The proportion of time Opensignal users with a 5G device and a 5G subscription had an active 5G connection

5G in South Africa: Coverage & Usage

- 4G population coverage = 98% (2023)
- 5G population coverage = 38% (Up from 20% in 2022)
- 5G base stations = 6 750 (~15%) (Up from 4 750 in 2022)
- 96% of households have at least one mobile phone
- 75% of households access the Internet
 - (mostly via mobile handsets)
- Smartphones = 69% of subscribers
- Internet at home = only 13% of households
 - (huge urban rural divide (21% vs 2%))
- Usage gap - coverage, but limited uptake

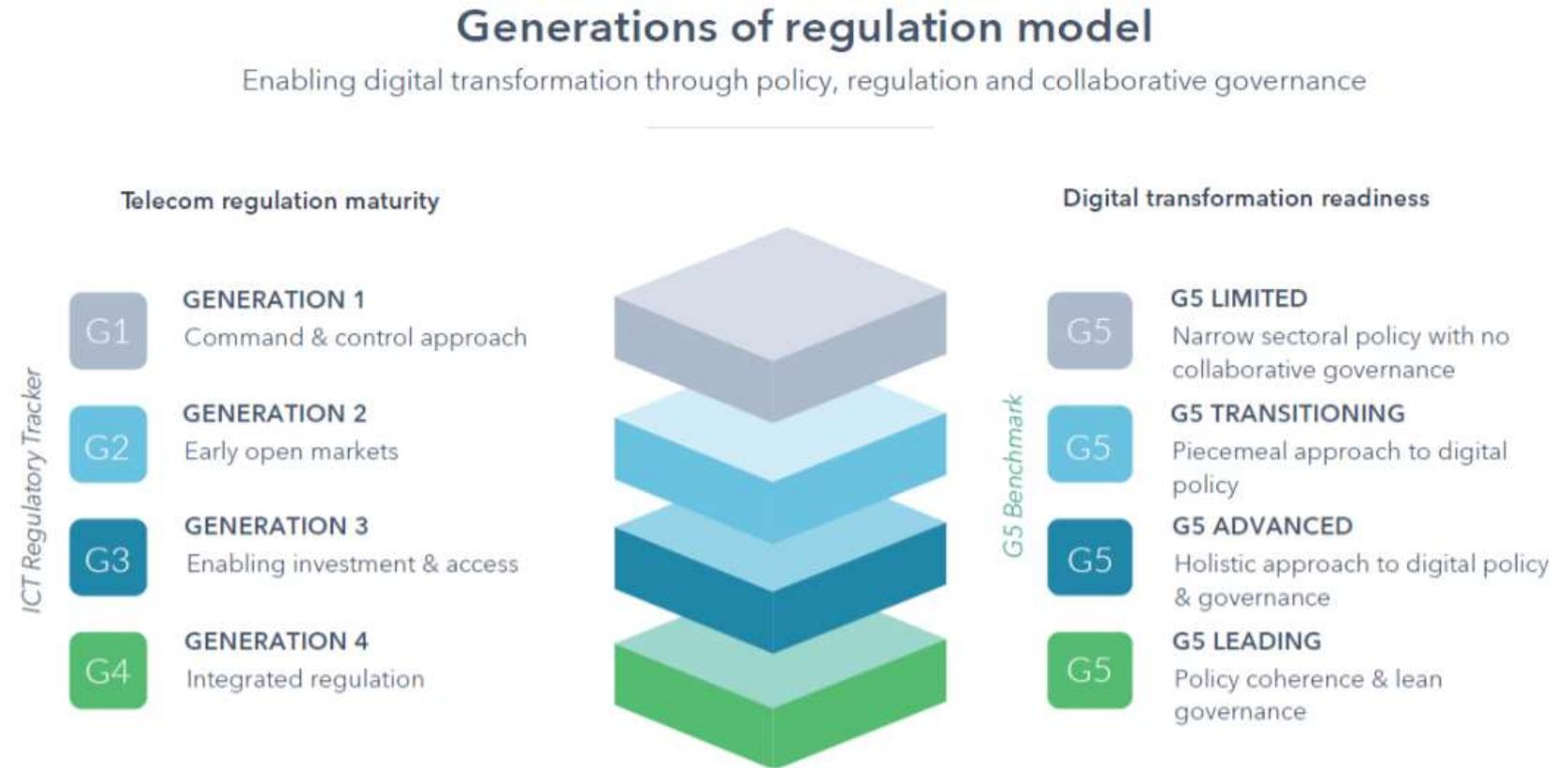


5G Deployments & Universal Access in SA

- Bulk of 5G deployments = metropolises (Jhb, Pta, Cpt, Dbn) & 72+ towns
 - But focus is on affluent consumers & enterprise FWA
- Barriers to uptake & usage = digital divide = barriers to SDGs:
 - **Income divide:** Rich vs poor (GINI = 63, unemployment = 33% / 42%) - lack of affordability of devices, lack of affordability of data, minutes
 - **Geographic divide:** Urban vs peri-urban vs informal settlements vs rural areas - lack of availability of networks / services
 - **Skills divide:** lack of digital skills, language barriers, lack of relevant content - accessibility of content & services
 - **Other issues:** erratic electricity supply, base station theft & vandalism, apartheid legacy, gender, disability
- **How to ensure 5G & 6G don't simply exacerbate existing digital divisions?**

5G in South Africa: How can Regulation help?

- Adopt a collaborative approach
- Envisage the future
- Put the public interest first
- Intervene where appropriate to enable the future



Role of Regulation: Making Spectrum Available

- Technology neutral licensing framework is critical
 - Facilitates refarming flexibility between 4G, 5G, 6G
- ICASA's 2022 spectrum auction
 - Assigned 300+ MHz, in low and mid bands, raised USD 1 billion
 - Spurred 5G Deployment (thanks also to Covid-19)
 - Requires significant USOs - Public schools, Health facilities, Libraries, Traditional authority offices
- Next spectrum auction
 - Planned for 2025, with additional low- & mid-band IMT spectrum
- Supported by:
 - IMT Roadmap, RFSAPs for IMT, Long-term Spectrum Outlook, Wi-Fi 6E, DSA
- Outcomes of WRC23 (Final Acts awaited)
 - New spectrum for IMT (incl upper 6 GHz), HIBs / HAPs
 - IMT from space (ESIMs) under study
 - IMT2030 (6G) framework adopted
 - SA National Radio Frequency Plan update in progress

Role of Regulation: Making Spectrum Available

No.	Band	Amount of spectrum <u>assigned</u> for IMT usage	Amount of spectrum <u>in actual use</u> by IMT systems
1	450 - 470 MHz	20 MHz	0 MHz
2	694 - 790 MHz	96 MHz	60 MHz
3	790 - 960 MHz	72 MHz	60 MHz
4	1 427 - 1 518 MHz	90 MHz	0 MHz
7	1 710 - 1 885 MHz	75 MHz	75 MHz
8	1 885 - 2 025 MHz	100 MHz	100 MHz
9	2 010 - 2 025 MHz	15 MHz	15 MHz
10	2 110 - 2 200 MHz	90 MHz	90 MHz
11	2 300 - 2 400 MHz	100 MHz	60 MHz
12	2 500 - 2 690 MHz	190 MHz	190 MHz
13	3 300 - 3 400 MHz	100 MHz	0 MHz
14	3 400 - 3 600 MHz	200 MHz	200 MHz
15	4 800 - 4 990 MHz	190 MHz	0 MHz
Total	Low and Mid Bands	1 338 MHz	850 MHz- Approximately 64% Assigned
16	24.25 - 27.5 GHz	3250 MHz	0 MHz
17	37 - 43.5 GHz	6500 MHz	0 MHz
18	45.5 - 47 GHz	1500 MHz	0 MHz
19	47.2 - 48.2 GHz	1000 MHz	0 MHz
20	66 - 71 GHz	5000 MHz	0 MHz

Mostly FDD

TDD



Role of Regulation: Making Spectrum Available

Radio Frequency Band (MHz)															
Status	450	700	750	800	850	900	1400	1800	2100	2300	2600	3300	3500	4800	Total BW (MHz)
Assigned					10	66		154	120	60	20		84		514
Auctioned		40		40							140		76		296
Reserved (WOAN)		20									30		30		80
Future	20		25	20			91		10	40		100	10	190	506
Total	20	60	25	60	10	66	91	154	130	100	190	100	200	190	1396



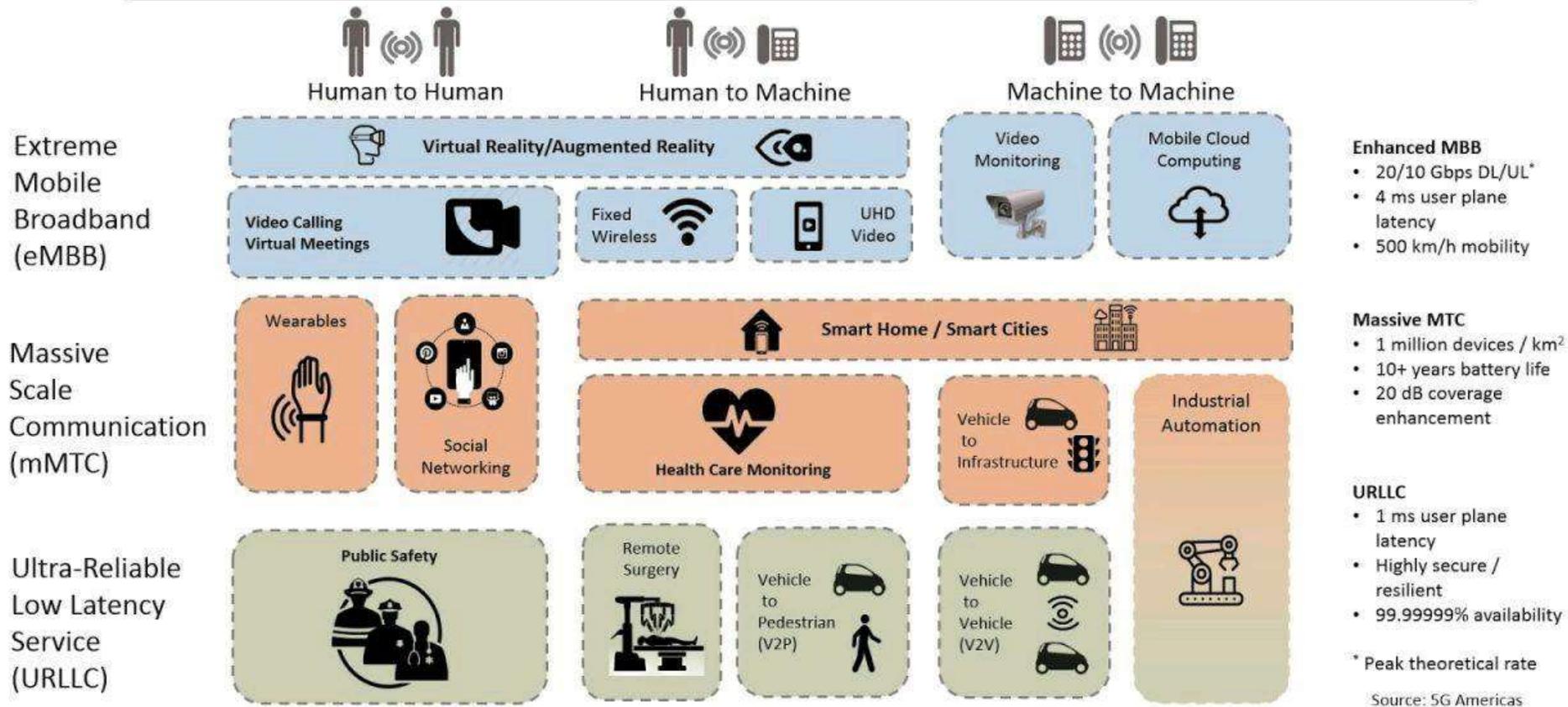
Role of Regulation: Stakeholder Engagement

- Stakeholder 5G Forum established by ICASA
 - Similar forums exist in S Korea, India, Spain
 - Likely soon to become 'IMT Forum SA' to cater for 5G, G and beyond
 - Provides advice to the regulator
 - Offers neutral platform for stakeholders to engage
 - Five working groups
 - Spectrum, Use Cases, Standards, R&D, Policy & Regulation
- Regulators' Forum
 - To bring together all regulatory entities with digital regulatory competencies
 - Share information, undertake research, develop common approaches



Role of Regulation: Use Cases for 5G

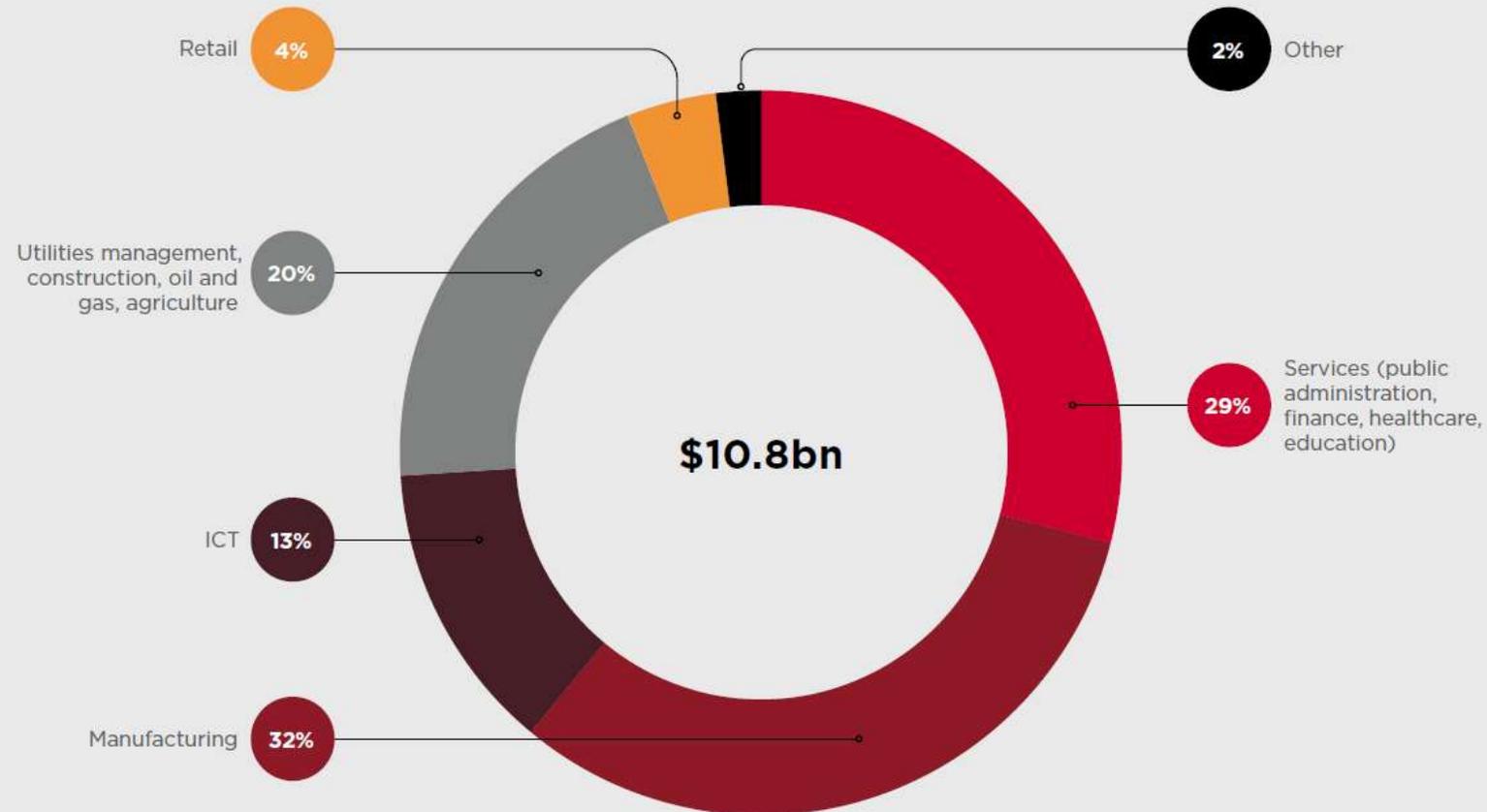
Summary of 5G Use Cases



Role of Regulation: 5G and the Economy

Sub-Saharan Africa: 5G contribution by industry, 2030

Percentage of total benefit



Role of Regulation: Use Cases for 5G

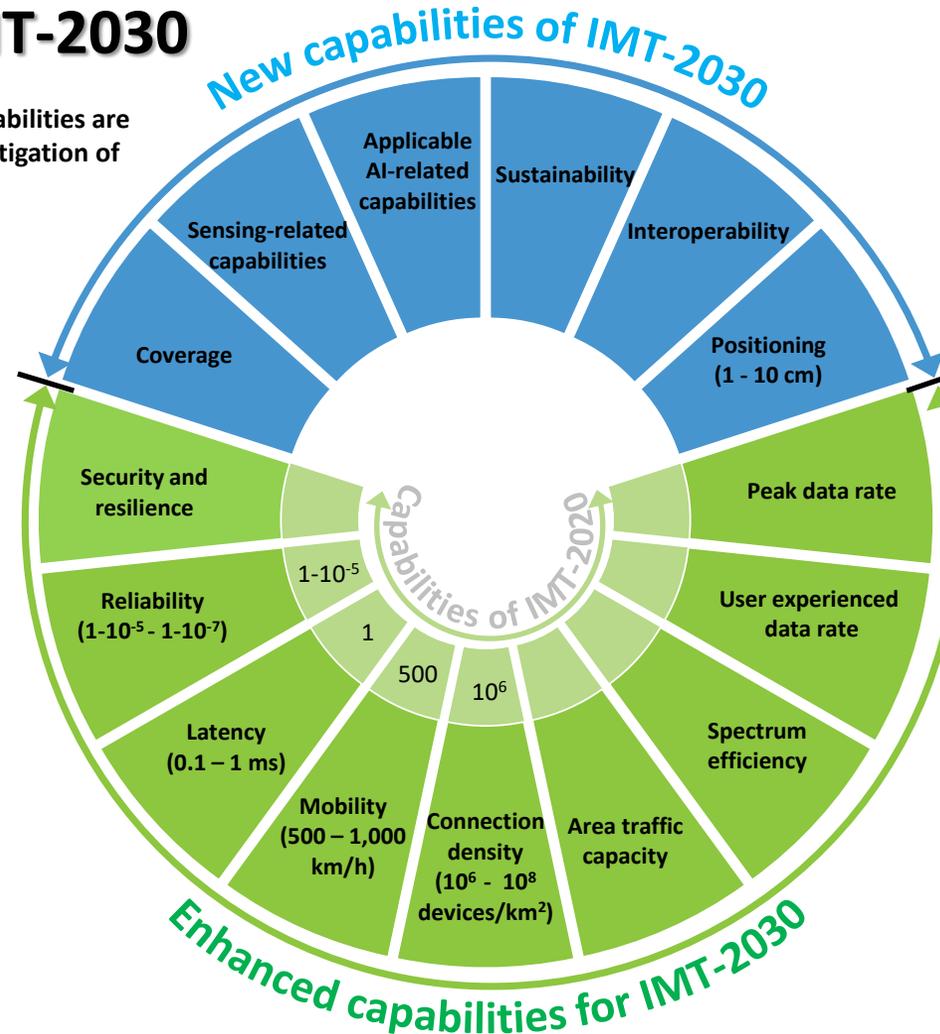
- Use cases are essential: why else do 5G?
- Responsibility of industry, service providers, researchers
- Possibilities include:
 - Industry verticals, campus deployments, urban & rural FWA
- Need to exploit specific 5G / 6G capabilities
 - Speed & bandwidth, low latency, capacity & reliability
- Need to address national social & economic realities & imperatives
 - African problems demand African solutions
- Most current use cases cater to the high end
 - Large-scale mining, advanced manufacturing, agri-tech, high-end transportation & logistics
- Little demand to date in SA for campus networks, industry 4.0
- Some use case developments in mining, ports, agri-business



Role of Regulation: Use Cases for 6G?

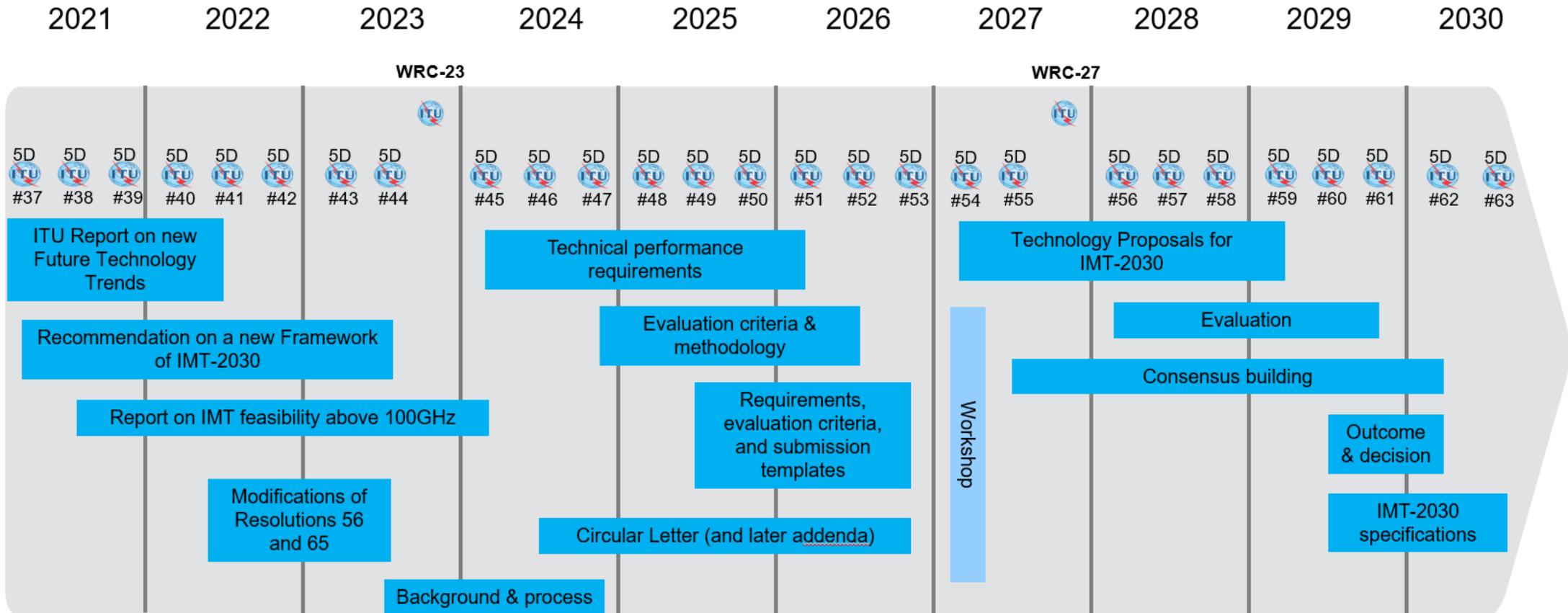
Capabilities of IMT-2030

NOTE: The range of values given for capabilities are estimated targets for research and investigation of IMT-2030.



Role of Regulation: Timeline towards 6G

WP 5D timeline for IMT-2030



Note 1: Meeting 5D#59 will additionally organize a workshop involving the Proponents and registered IEGs to support the evaluation process
 Note 2: While not expected to change, details may be adjusted if warranted. Content of deliverables to be defined by responsible WP 5D groups



Role of Regulation: Regulatory Sandboxes

Sandbox Elements	 Colombia	 France	 Thailand
Compliance	Flexible regulation or regulatory exemption, on case-by-case basis	Full or partial exemption from regulation, on case-by-case basis	Reduced regulation, but must not charge fees or connect to networks
Timeframe	Sandbox licence valid up to two years	Sandbox licence valid up to two years	Sandbox licence valid up to two years
Regulatory guidance	Regulator evaluates performance with results published after trial period	Regulator assists with administrative procedures until full licence award	Licensees must report on progress to regulator every three months
Examples	Framework adopted in May 2020; licences to be awarded in 2021	Aerospace company testing communications onboard aircraft	Utility company testing micro-grid for power and water services

Role of Regulation: Sandboxing for 5G / 6G

- Sandboxing = test licences on steroids
- Active, structured vs passive, unstructured



Sustainability: The Role of the Regulator

- Collaborative regulation - regulate to facilitate, enable
 - Be a traffic warden, not a speed cop
- Regulate in the public interest
 - Support economic growth, job creation, social development & cultural enrichment
 - Promote universal access & service
- Develop research capacity: Keep a watching & responsive brief on technology trends and market developments
- Active spectrum foresight, planning & assignment modalities
- Engage stakeholders, consumers, researchers, other regulators
- Support regulatory sandboxes for 5G, 6G
- Facilitate rights of way acquisition, infrastructure sharing - support deployment
- Ensure all consumers enjoy a wide variety of the services they desire, for education, work & play, of appropriate quality, at affordable prices

Thank You

**Enkosi
Ngiyabonga
Kea leboga
Dankie**

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