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INDEPENDENT COMMUNICATIONS
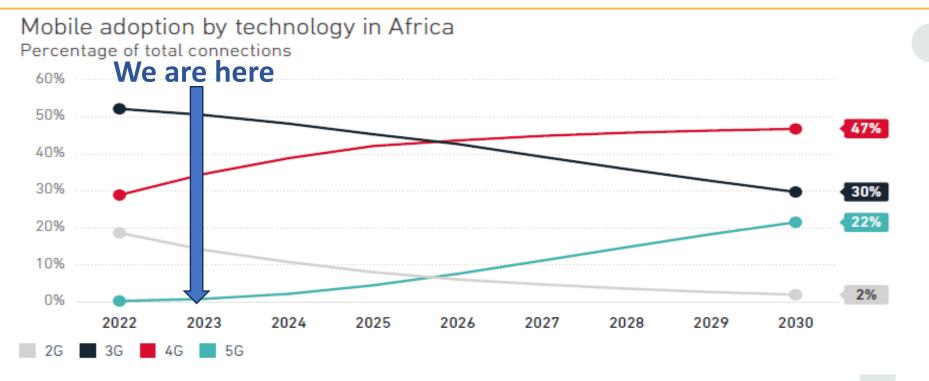AUTHORITY OF SOUTH AFRICA

5G and beyond
The role of regulation

Wireless Infrastructure Association, CSIR, March 2024

Dr Charley Lewis, Councillor, ICASA

The views expressed in this presentation do not necessarily reflect those of ICASA

Status of IMT in Africa (2G → 3G → 4G → 5G (?))

Mobile adoption by technology in Africa
Percentage of total connections

We are here

Chart legend: 2G, 3G, 4G, 5G

Values (2030): 4G = 47%, 3G = 30%, 5G = 22%, 2G = 2%

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

Coverage gap = 15% - Usage gap = 59%

60% of subscribers use mobile Internet

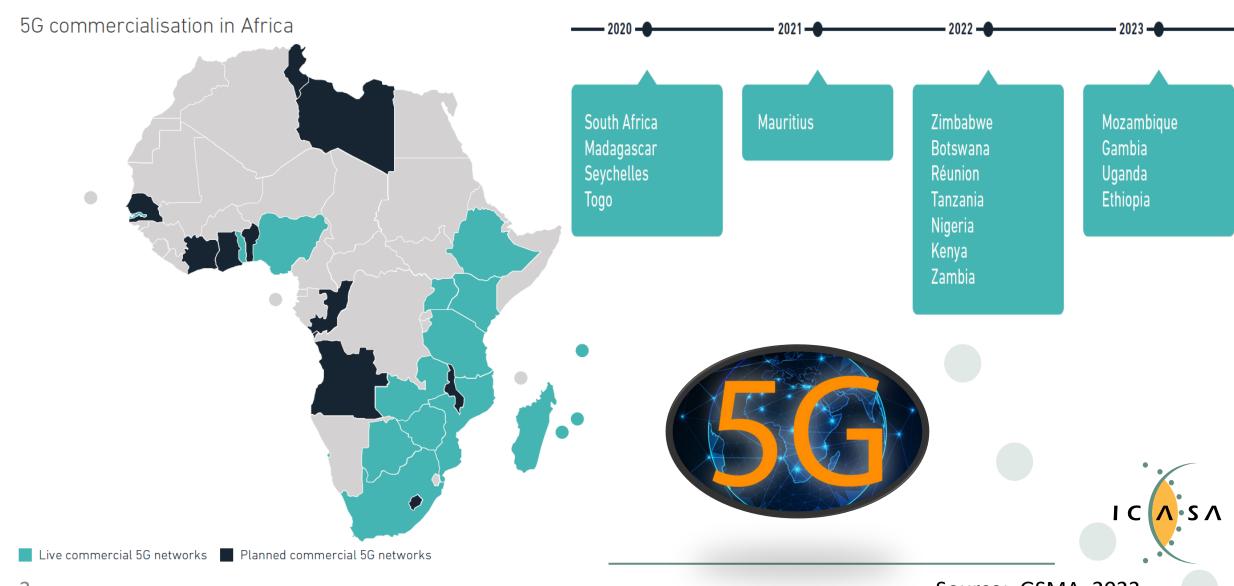**51% of subscribers have smartphones**

Smartphones = 49% of subscribers

Sources: GSMA, 2023

5G in Deployments Africa

5G commercialisation in Africa

2020 — 2021 — 2022 — 2023

2020
South Africa
Madagascar
Seychelles
Togo

2021
Mauritius

2022
Zimbabwe
Botswana
Réunion
Tanzania
Nigeria
Kenya
Zambia

2023
Mozambique
Gambia
Uganda
Ethiopia

Live commercial 5G networks   Planned commercial 5G networks

3

Source: GSMA, 2023

5G Deployments & Universal Access in SA

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

5G in South Africa: Gaps in 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%)
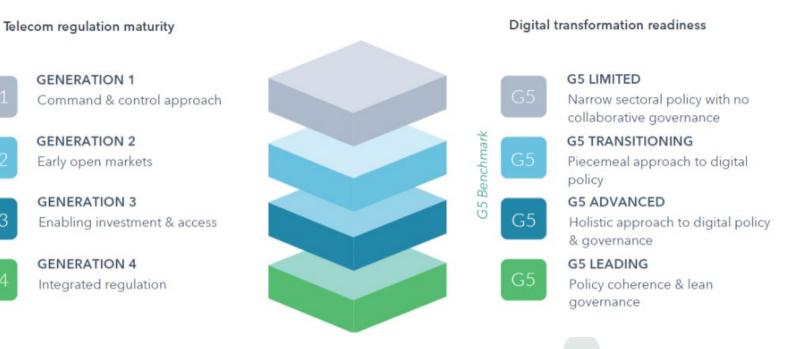
- Usage gap - coverage, but limited uptake

Sources: Stats SA, 2023; ICASA, forthcoming

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

Generations of regulation model

Enabling digital transformation through policy, regulation and collaborative governance

Telecom regulation maturity

ICT Regulatory Tracker

G1 GENERATION 1
Command & control approach

G2 GENERATION 2
Early open markets

G3 GENERATION 3
Enabling investment & access

G4 GENERATION 4
Integrated regulation

Digital transformation readiness

G5 Benchmark

G5 G5 LIMITED
Narrow sectoral policy with no collaborative governance

G5 G5 TRANSITIONING
Piecemeal approach to digital policy

G5 G5 ADVANCED
Holistic approach to digital policy & governance

G5 G5 LEADING
Policy coherence & lean governance
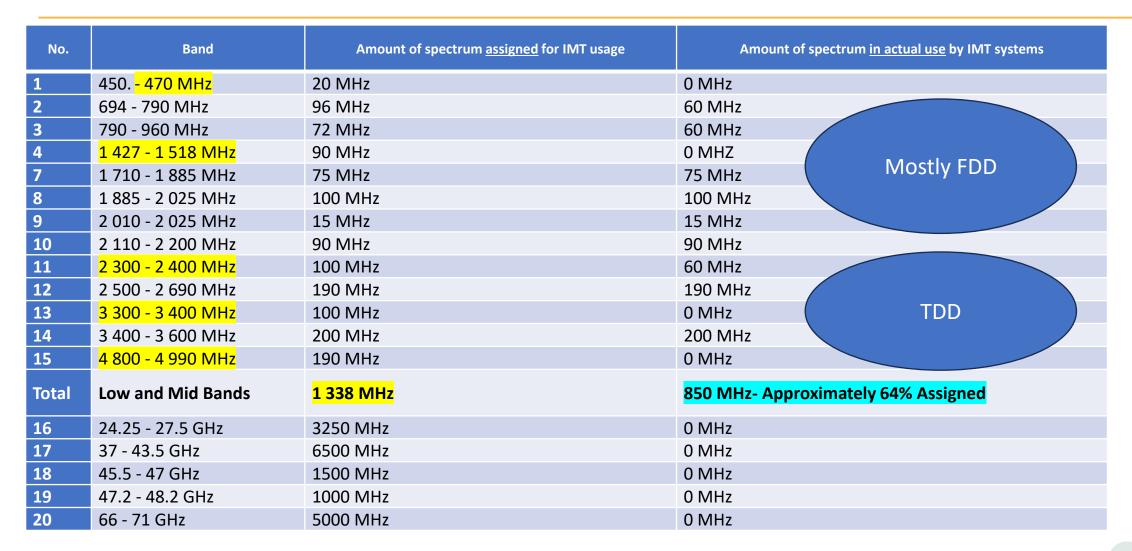
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Image source: ITU, nd

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
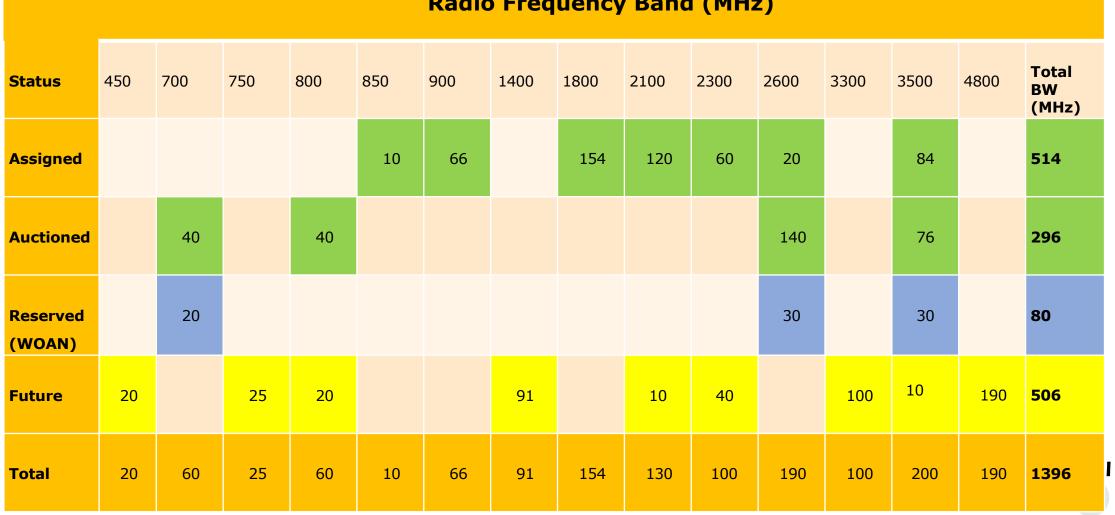 - SA National Radio Frequency Plan update in progress

Role of Regulation: Making Spectrum Available

No.	Band	Amount of spectrum _assigned_ for IMT usage	Amount of spectrum _in actual use_ 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

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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**

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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
- Forum for regulatory engagement
  - 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

$10.8bn

- Retail — 4%
- Other — 2%
- Utilities management, construction, oil and gas, agriculture — 20%
- Services (public administration, finance, healthcare, education) — 29%
- ICT — 13%
- Manufacturing — 32%

Source: GSMA, 2023

Role of Regulation: Use Cases for 5G

- Use cases are essential: why else do 5G?
- Responsibility of industry, service providers
- Industry verticals, campus deployments
- Is there a case for FWA?
- Need to exploit specific 5G / 6G capabilities
- Need to address national social & economic realities
- Most current use cases cater to the high end
  - Large-scale mining, advanced manufacturing, agri-tech, high-end transportation & logistics
- Little demand to date for campus networks, industry 4.0
- Some use case developments in mining, ports, agri-business

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
- 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 (Rapid Deployment)
- Support economic growth and job creation
- Promote universal access & service
- Ensure all consumers enjoy a wide variety of the services they desire, for education, work & play, of appropriate quality, at affordable prices

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Thank You

Enkosi
Ngiyabonga
Kea leboga
Dankie

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