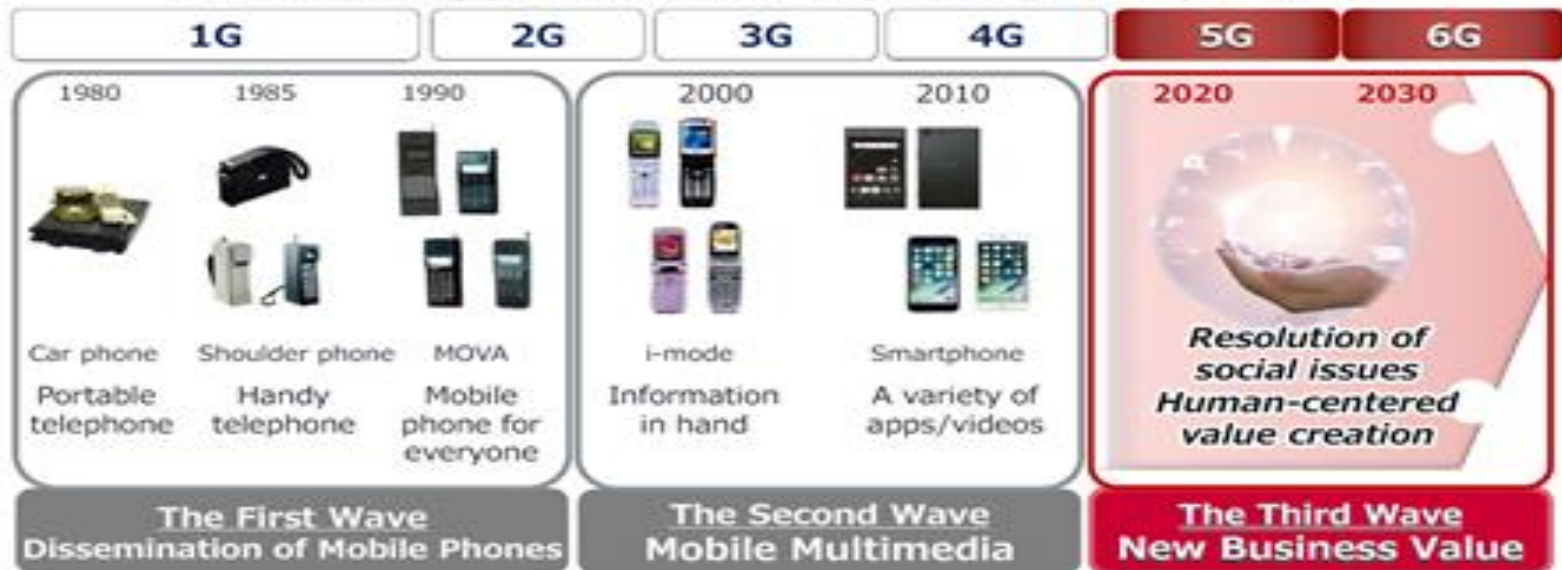


EEE4121F-Module A

Mobile and Wireless Networks

Olabisi E. Falowo (olabisi.falowo@uct.ac.za)

Technology evolution (every 10 years)



Creating new value for markets (every 20 years)

Evolution of technologies and services in mobile communications

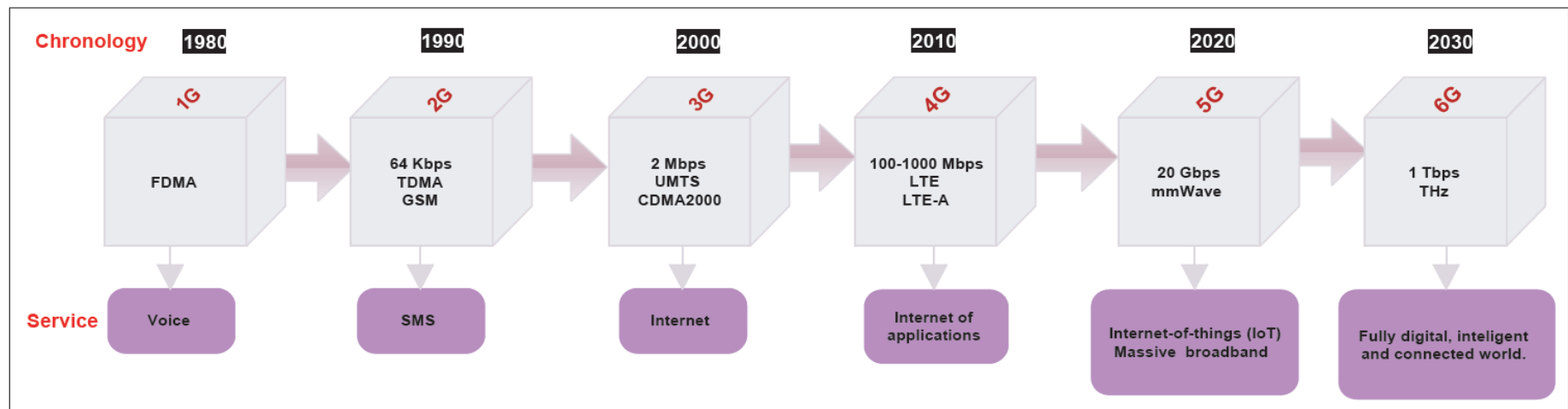
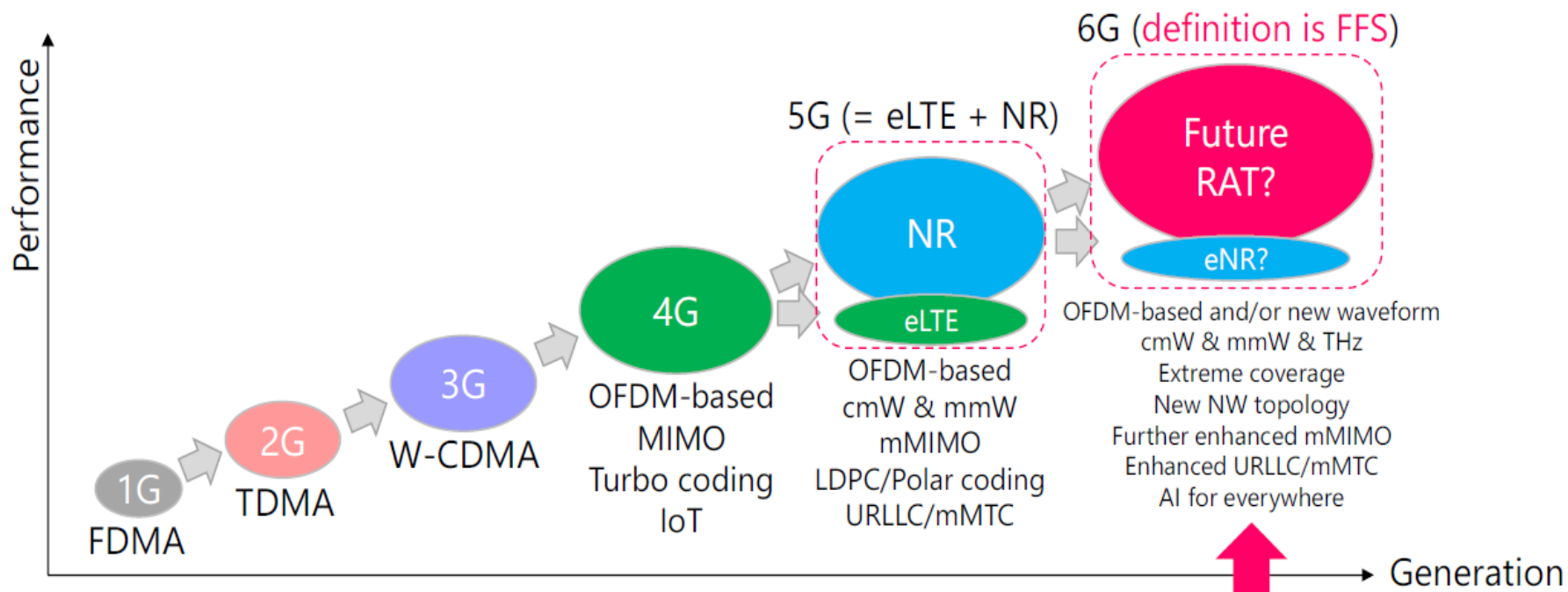


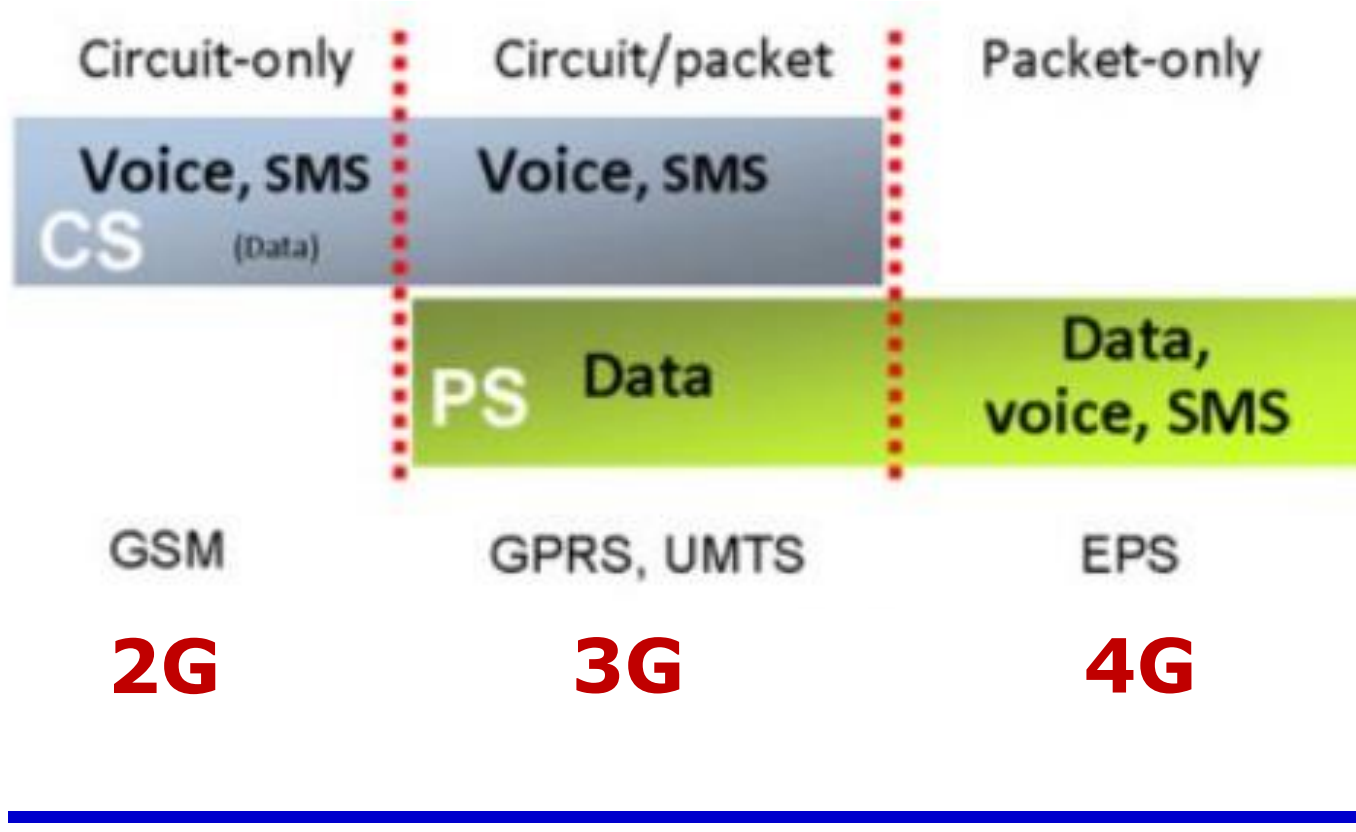
FIGURE 1. Evolution toward 6G (adapted)



6G will be a combination of new technologies and enhancements to bring "Big gain"

Technological evolution up to 6G in mobile communications

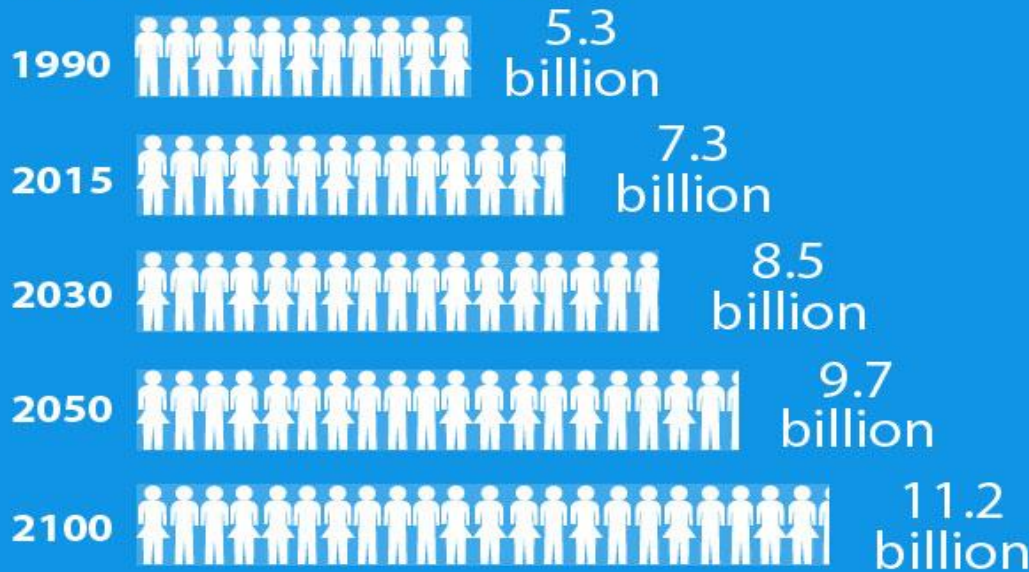
Evolution of Switching Technologies



Global Telecom Trends - Population

World Population

Projected world population until 2100



Source: United Nations Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2015 Revision*
Produced by: United Nations Department of Public Information

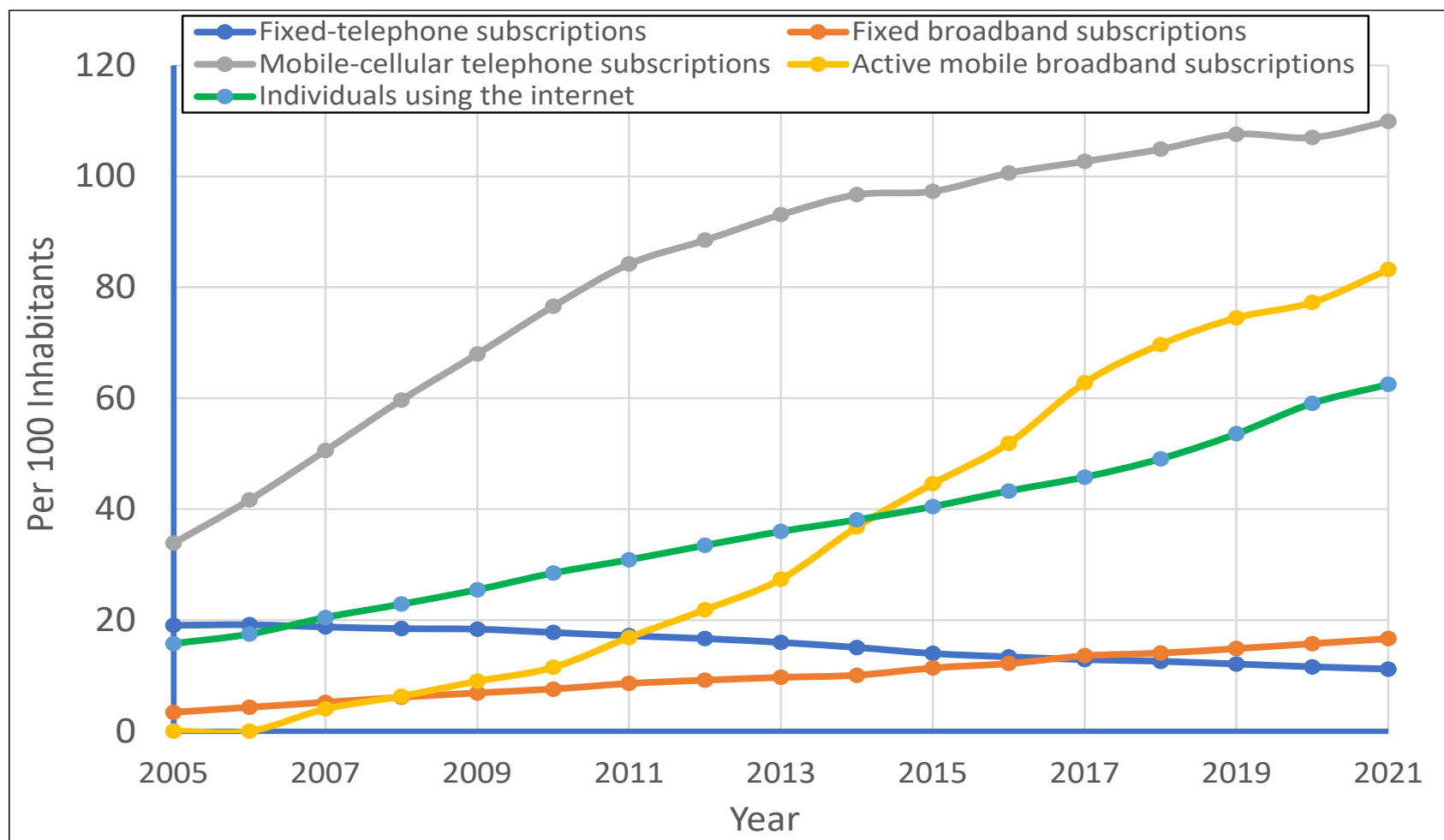


ITU CONNECT 2030 Goals and Targets

- ☐ By 2023, 60% of households worldwide with access to the internet
- ☐ By 2023, 70% of individuals worldwide will be using the internet
- ☐ By 2023, internet access should be 25% more affordable (baseline 2017)

World population is currently about 7.9 billion

Global Fixed and Mobile Subscriptions (2005-2021)

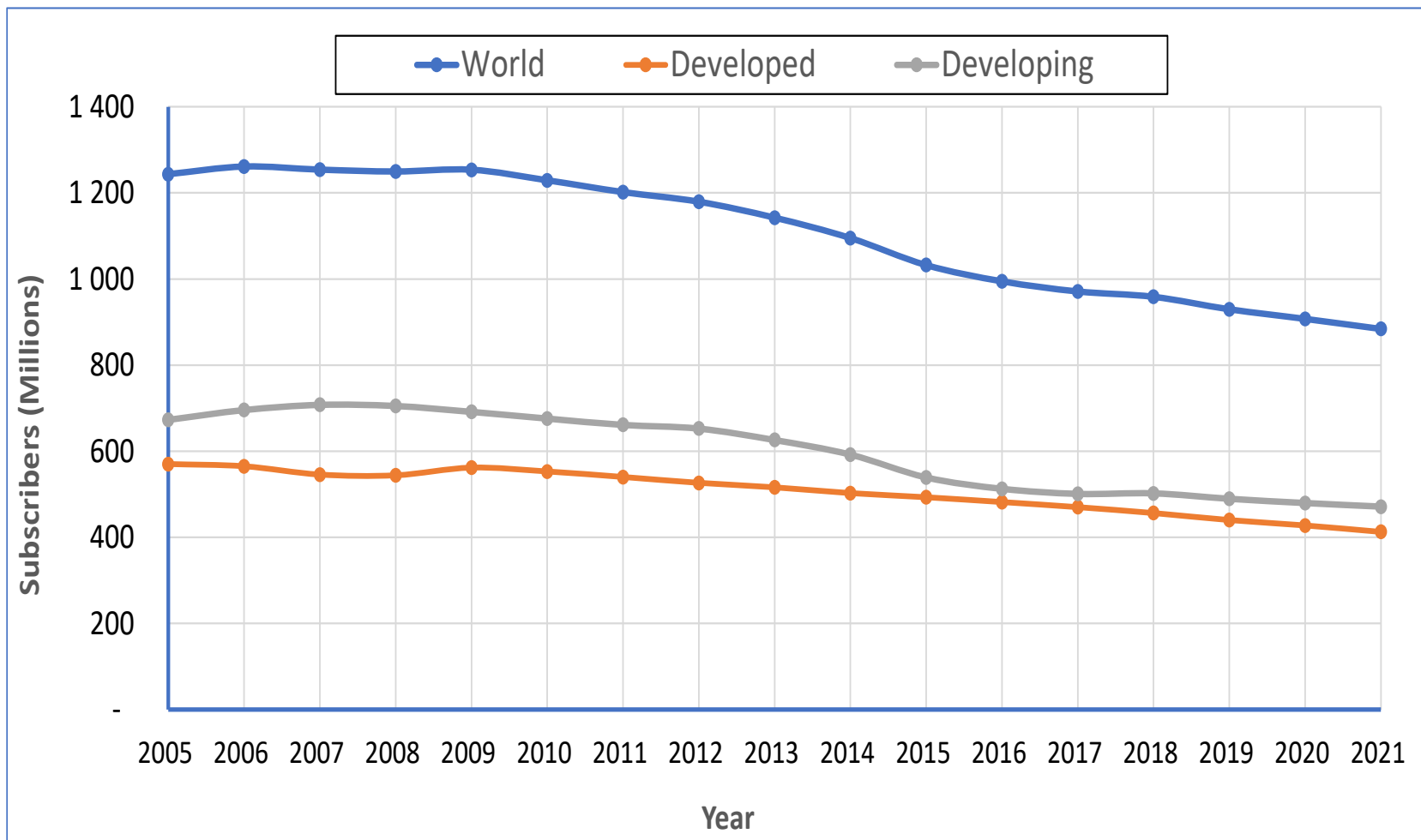


Explain three factors responsible for the increase in mobile-cellular telephone subscriptions between 2005 and 2021.

Source: ITU World telecommunication/ICT Indicator Database

Fixed Telephony Subscriptions

Fixed-telephone subscriptions (2005-2021)

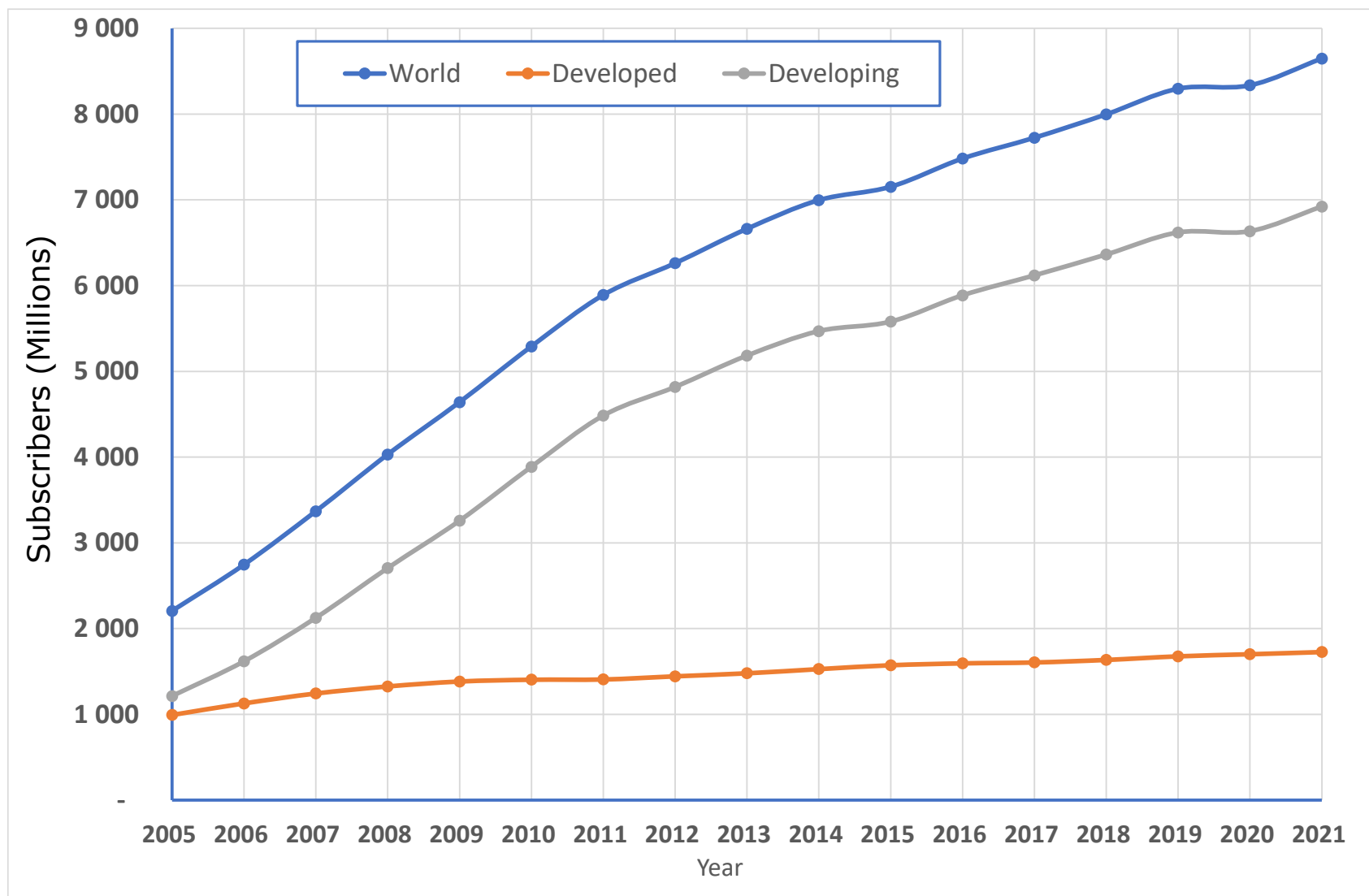


The numbers of fixed-telephone subscribers decreased between 2005 and 2021

Source: ITU World telecommunication/ICT Indicator Database

Mobile Cellular Subscriptions

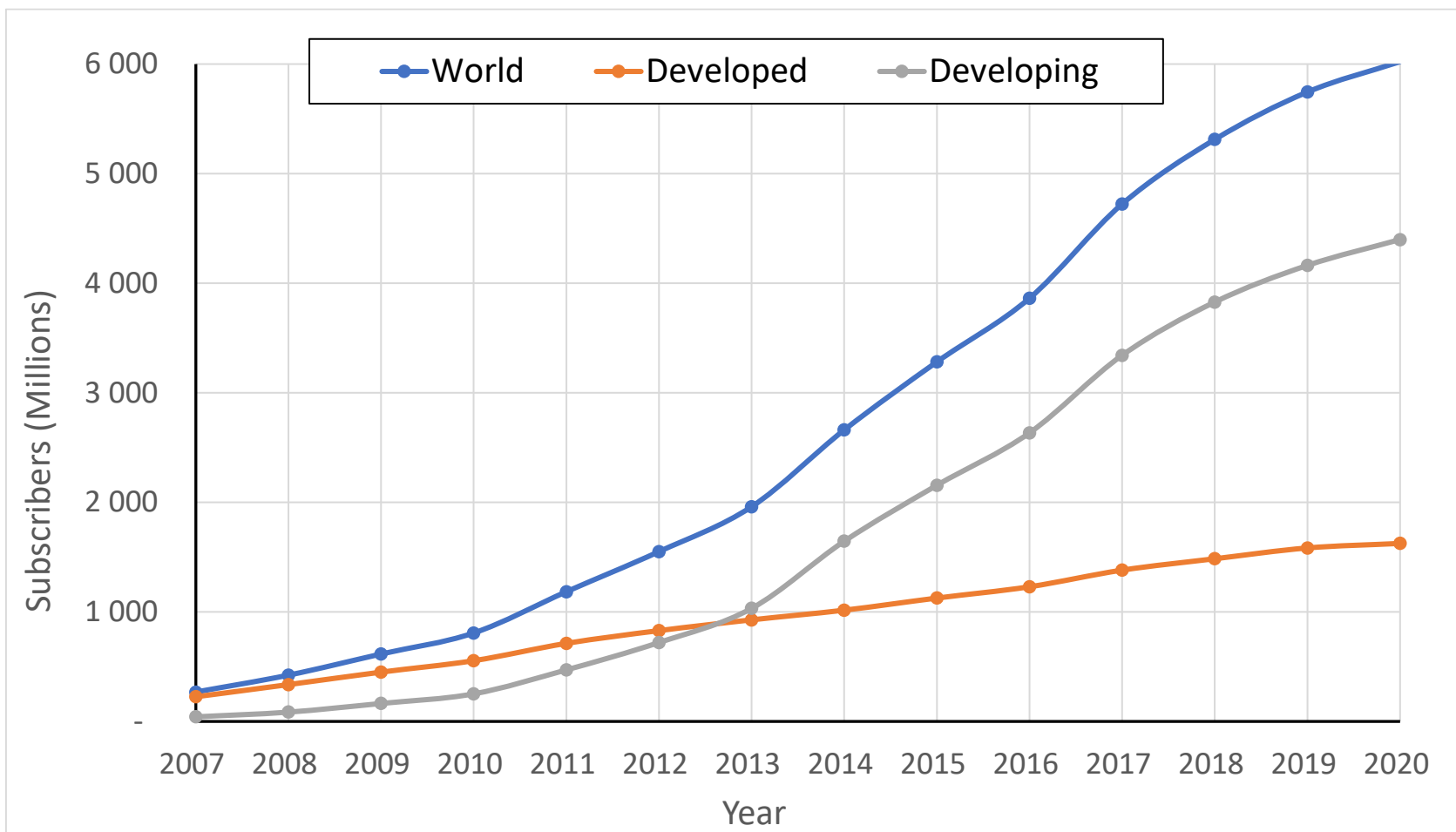
Mobile-Cellular Telephone Subscription (2005-2021)



Source: ITU World telecommunication/ICT Indicator Database

Mobile Broadband Subscriptions

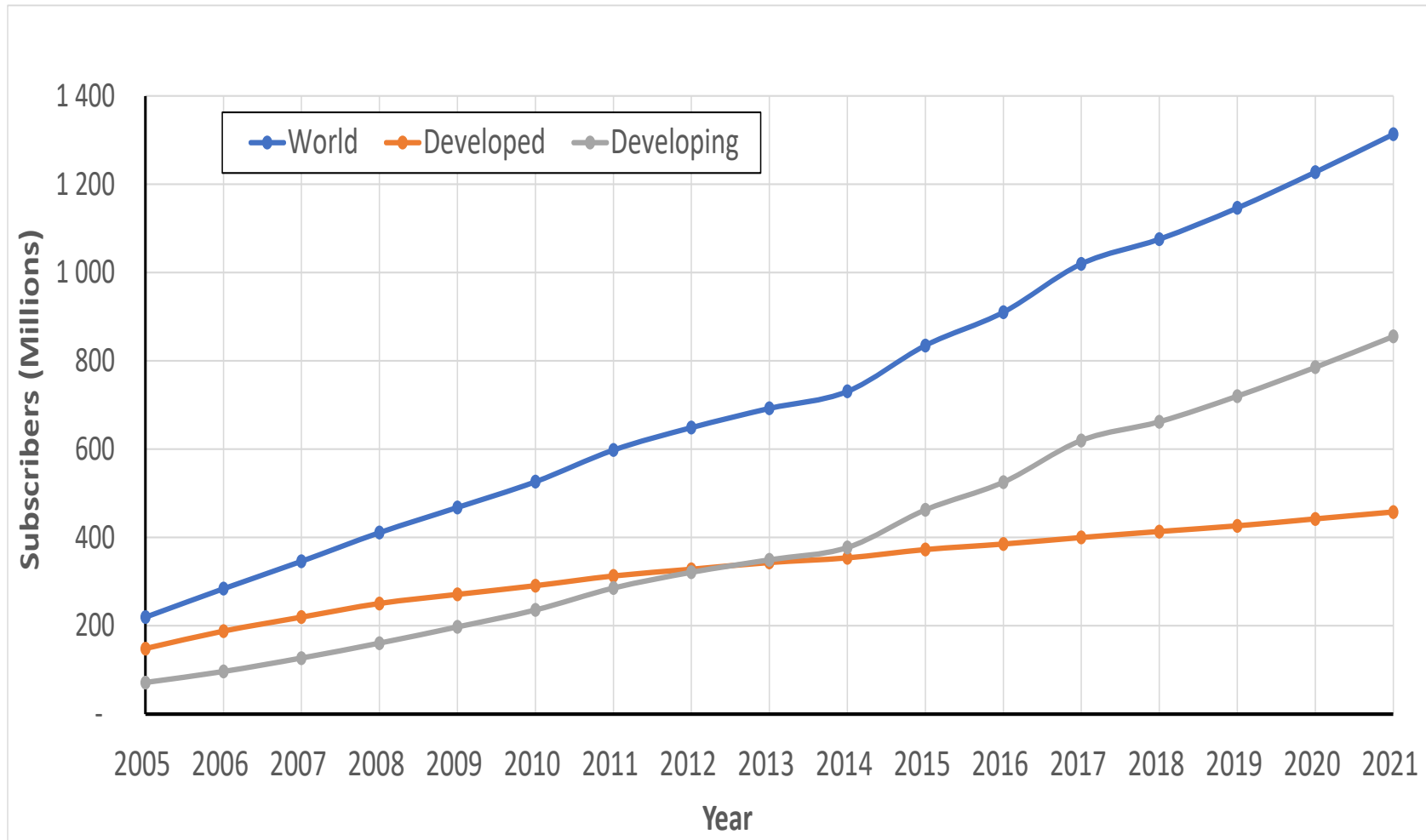
Active Mobile-broadband subscriptions (2007-2021)



Source: ITU World telecommunication/ICT Indicator Database

Fixed Broadband Subscriptions

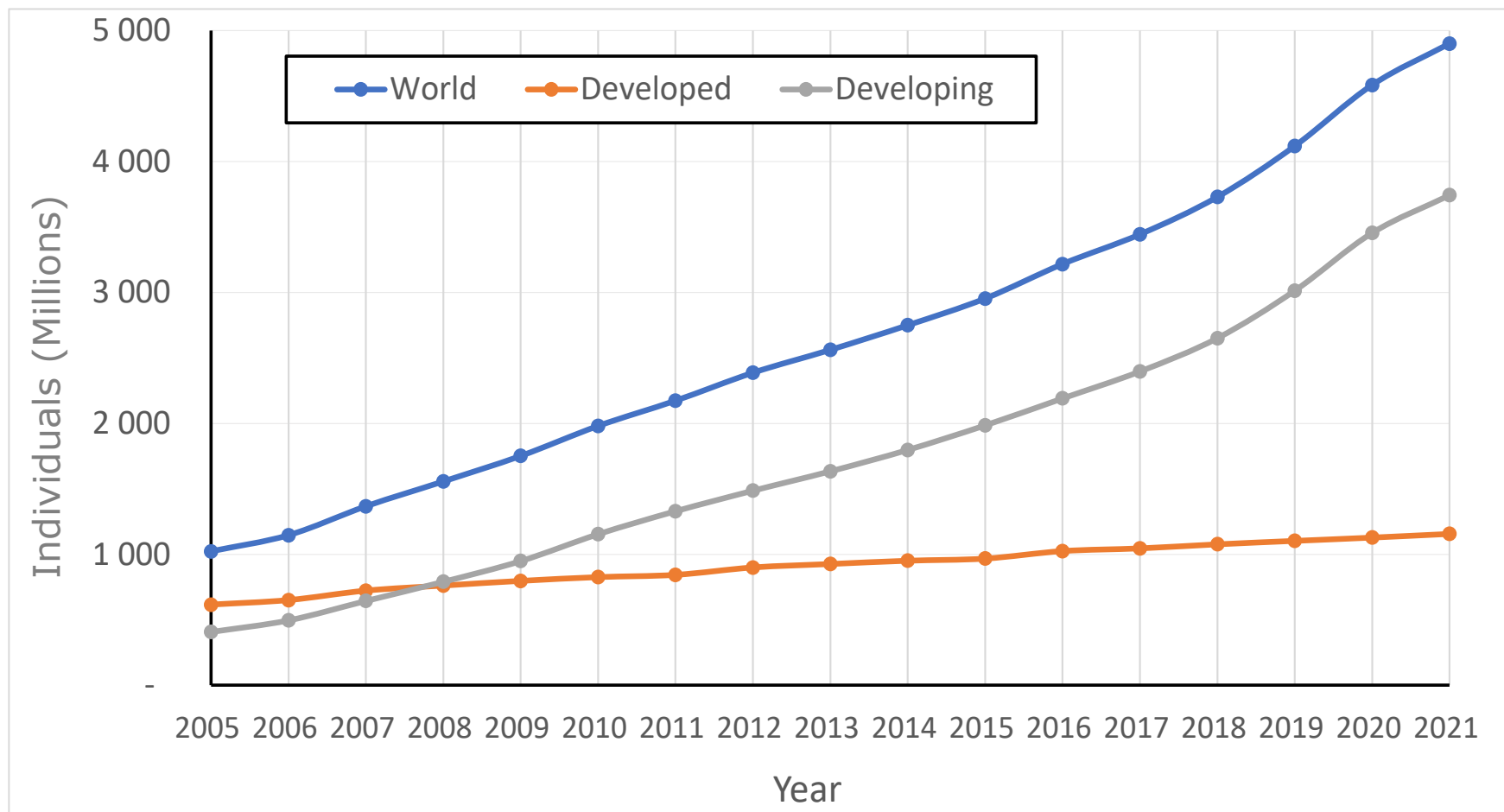
Fixed-broadband subscription (2005-2021)



Source: ITU World telecommunication/ICT Indicator Database

Internet users

Individuals using the internet (2005-2021)



Source: ITU World telecommunication/ICT Indicator Database

Telecommunications Global Market

From GSMA

UNIQUE MOBILE SUBSCRIBERS



2020-2025
CAGR: 1.8%

2020

5.2bn

2025

5.7bn



Penetration rate

Percentage of population



SIM CONNECTIONS

(excluding licensed cellular IoT)



2020-2025
CAGR: 1.7%

2020

8.1bn

2025

8.8bn



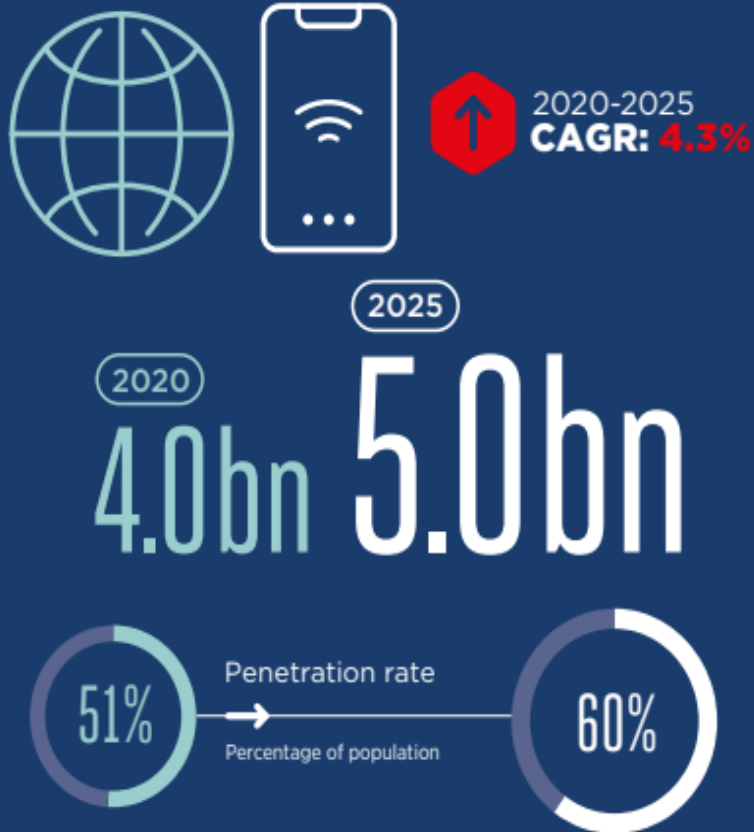
Penetration rate

Percentage of population



Internet Users and Operator Revenues

MOBILE INTERNET USERS



OPERATOR REVENUES AND INVESTMENT

Total revenues

2020

\$1.04tn

2025

\$1.15tn



Operator capex of **\$900 billion** for the period 2021-2025 (80% on 5G)

Percentage of connections (2G, 3G, 4G, 5G)

4G

Percentage of connections
(excluding licensed cellular IoT)

2020



2025



SMARTPHONES

2020



2025



Percentage of connections
(excluding licensed cellular IoT)

5G

2025

1.8bn
Connections



21%

Percentage of
total connections
(excluding licensed cellular IoT)

INTERNET OF THINGS

2020



13.1bn
Total connections

2025



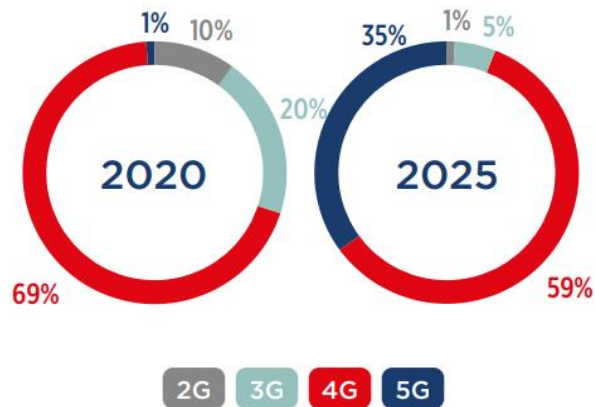
24.0bn
Total connections

Radio Access Technologies Used (2G, 3G, 4G, 5G)

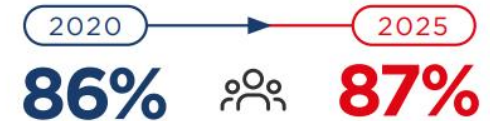
Europe



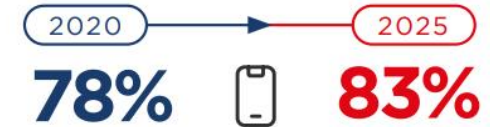
TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



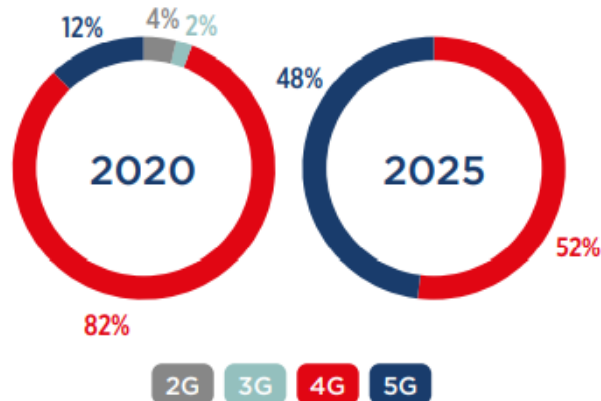
SMARTPHONE ADOPTION



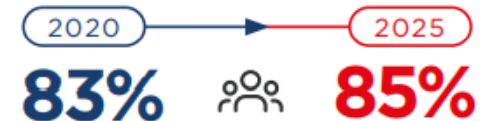
Greater China



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



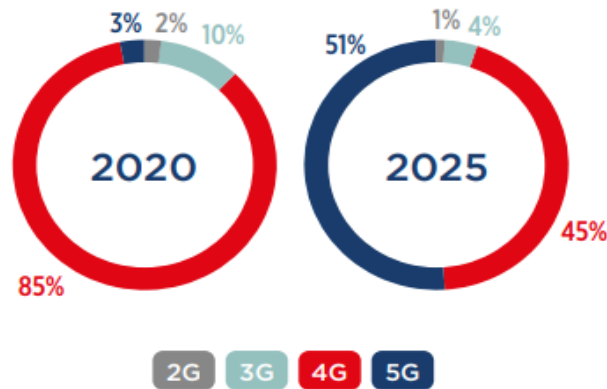
SMARTPHONE ADOPTION



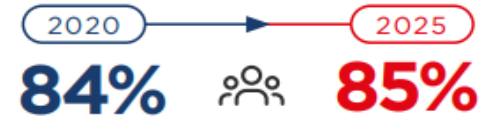
North America



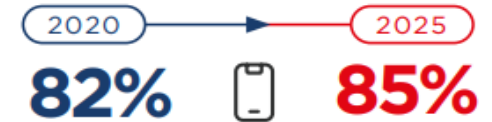
TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



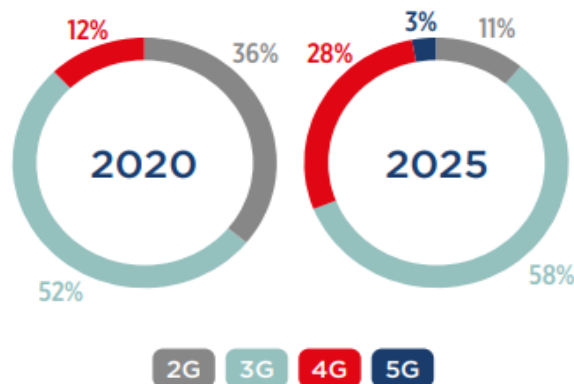
SMARTPHONE ADOPTION



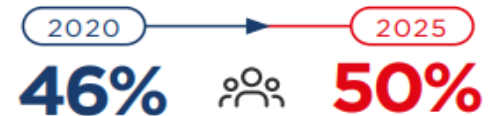
Sub-Saharan Africa



TECHNOLOGY MIX*



SUBSCRIBER PENETRATION



SMARTPHONE ADOPTION



Explain two major challenges associated with switching off of 2G and 3G networks in sub-Saharan Africa

*Note: Totals may not add up due to rounding

EEE4121F Module A

“A student without tangible goals cannot excel.
What are your goals for this semester?”