NOKIA

OSIPTEL
El rol de las telecomunicaciones hacia un Ecosistema y Economía Digital

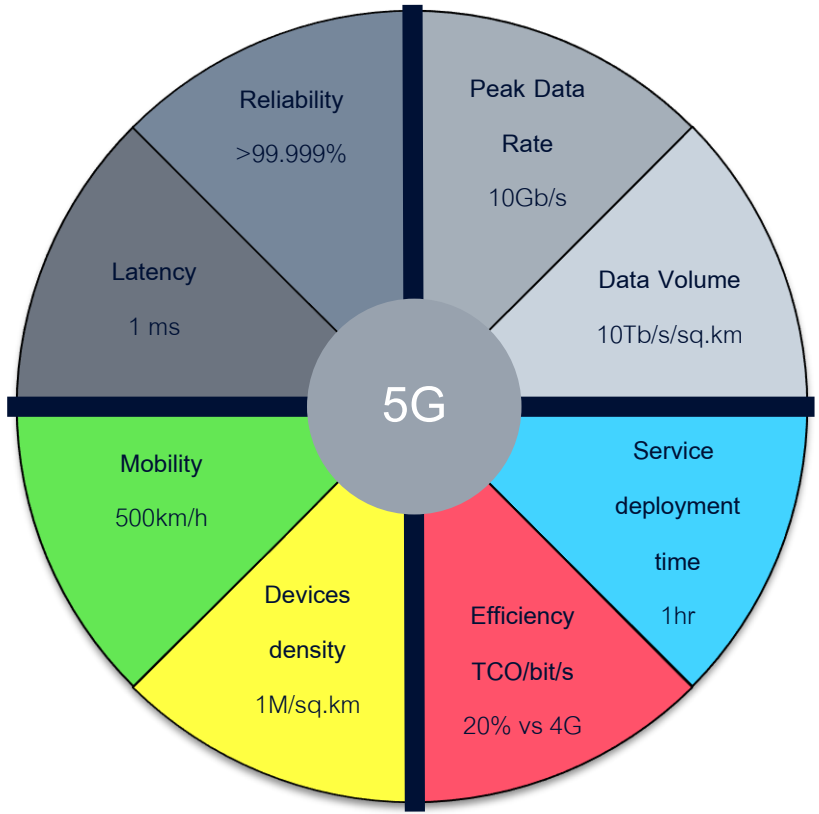
Wilson Cardoso (Ph.D)
Director de Tecnologia América Latina

5G Network Currencies and Capabilities

Driven by

Industrial

Automation



Driven by

Video

Consumption

Driven by

IoT

Driven by AI/ML

On Demand

Efficient, Open

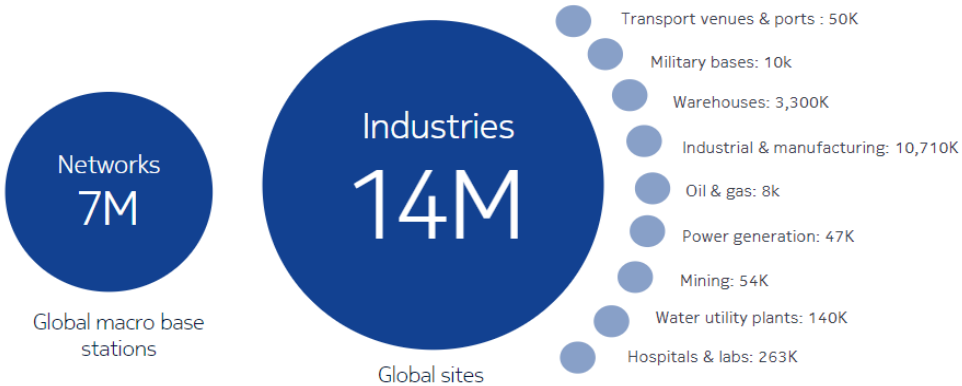
Service based

Enabling use cases for consumers and enterprises

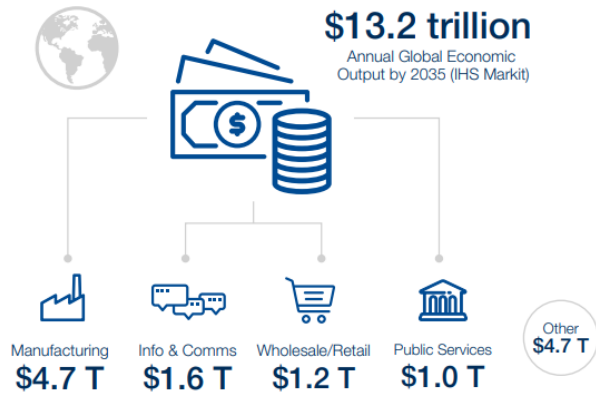
© 2020 Nokia

Intelligent Connectivity by 5G, will enable Growth

Opportunity for transformation in technology, market and business model



Source: Harbor Research



Source: Based on IHS Markit, The 5G Economy: How 5G will contribute to the global economy, 2019.

Technology Disruption: 5G for speed, quality and latency needed for innovative applications

Market Disruption:

New customers and markets

Business Model Disruption: New value chain partners enabling collaborative innovation

Nokia is committed to drive productivity and value capture with industrial players

© 2020 Nokia
Confidential

Peru 5G economic and social value impact

$126bn

5G economic output by 2035

Services

Services & ICT
$51bn

Manufacturing
$23bn

Mining
$22bn

Agriculture
$23bn

Construction
$15bn

Retail
$8bn

Other sectors
$3bn

Source: Omdia, based in IHS and Bell Lab economic models

© 2020 Omdia

Global 5G customer rollout phases

Use case drivers

Phase 1&2

NSA
- Single User speed
- eMBB

5G symbol
- Time to market
- New spectrum

TDD-NR
- Classical gNB

Phase 3

Coverage in/out
- Existing Spectrum
- FDD-NR
- Equipment reuse
- Sharing

SA
- 5GCN
- New 5G Biz Cases
- Slicing

Volume Device
- Commercial availability
- Price point

Phase 4 & 5

TCO
- Spectral efficiency
- Automation
- Cloud gNB

Rel'16 features
- URLLC
- Industrial IoT
- NR-Unlicensed
- Integrated Access & Backhaul

CTIA: 5G Will Provide Big Spectral Efficiency Gains

7/11/19 at 10:01 AM *by* Joan Engebretson

5G-era Mobile Network Cost Evolution

GSMA

Tuesday 22 October, 2019
By GSMA Future Networks Team
5G Digest | Digest | Latest News

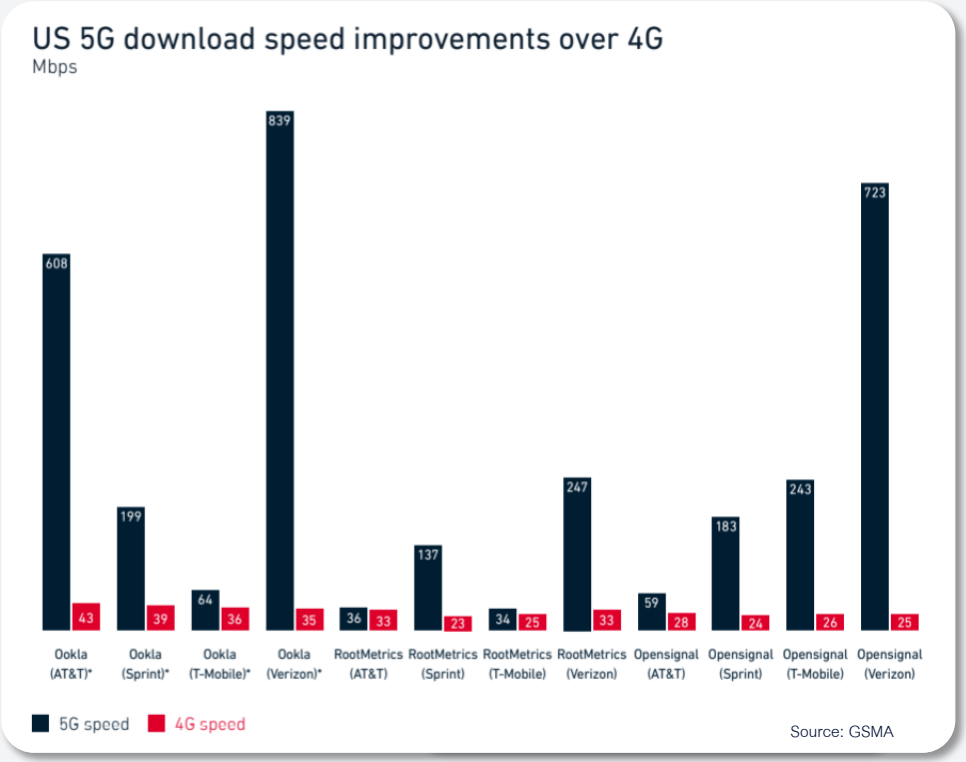
The road to 5G: The inevitable growth of infrastructure cost

February 2018 | Article

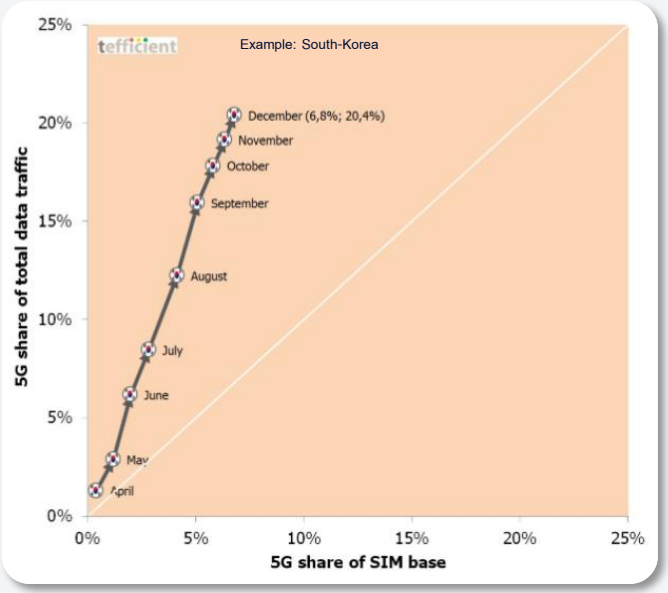
McKinsey & Company

© 2020 Nokia
NOKIA

Speed and data consumption experience in early 5G markets



A 5G subscription consumed **3x times** the traffic of a general subscription

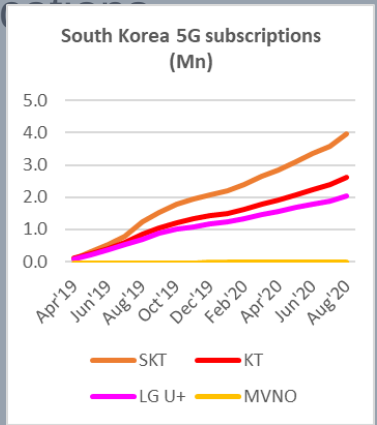


In Dec'19 the average 4G sub used 9.8 GB of mobile data whereas the average 5G sub used three times more: **27.3 GB**.

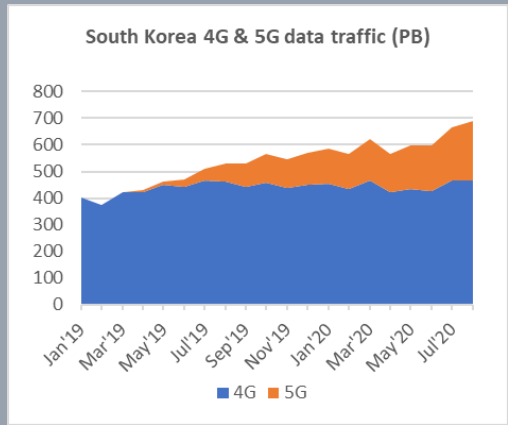
© 2020 Nokia

5G eMBB statistics from South Korea @ end-Aug'20

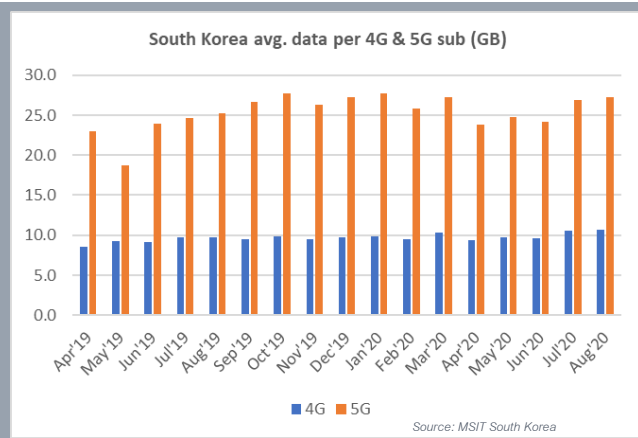
Strong 5G subscriber growth, high 5G (& 4G) data usage, positive monetization indications



8.66m 5G subscribers (=12.4% total mobile base)



32.6 % of total mobile data traffic was on 5G.



Average monthly 5G data usage Jan-Jun=25.7 GB (~2.6 x LTE average data usage).

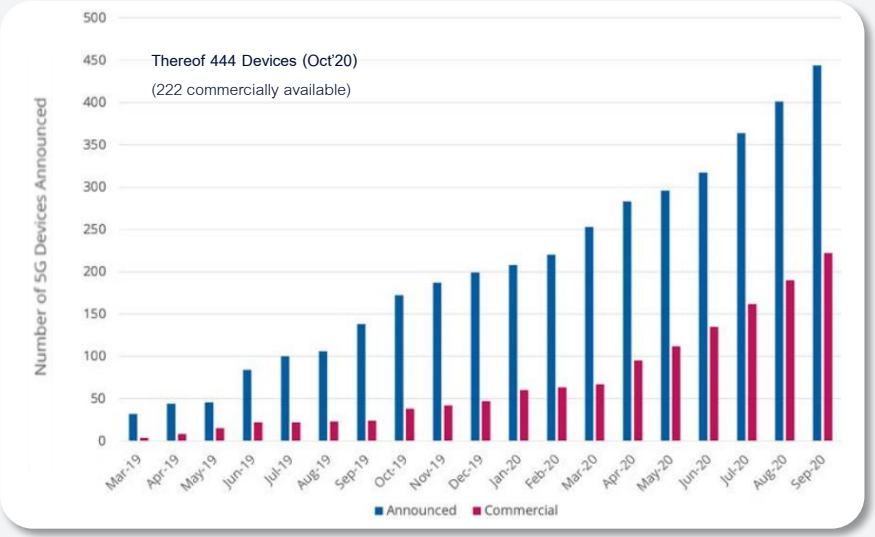
Early success indicators

- New services: SKT's 5G subscribers used 7x more VR, 3.6x more video streaming, 2.7x more gaming (compared to LTE).
- Tariff plans: >80% of KT's 5G subscribers signed up for their higher-tier plans
- Revenues: All operators reporting 2Q'20 increases in mobile service revenues, driven by 5G subscriber growth

© 2020 Nokia

Devices

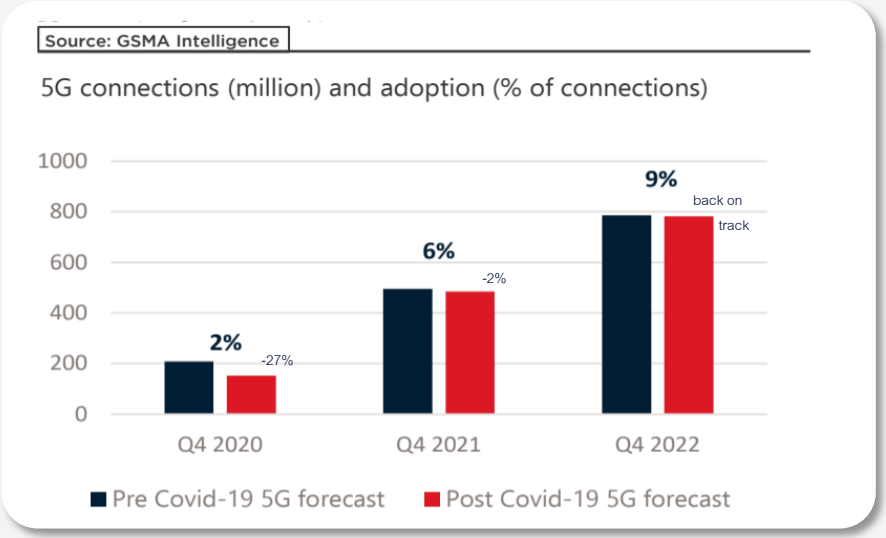
5G devices announced



Source: GSA, Oct'20

- 444 announced 5G devices (all types)
- Thereof 200 phones – 148 commercially available

Global 5G smartphone shipments and penetration, 2019 - 23



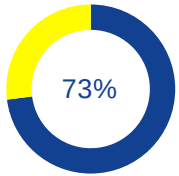
Source: Omdia

- Global 5G smartphone market expected to surge to 231mio units in 2020, forecasted to more than double from 2020 to 2021.
- Standalone capable phones to reach markets during 1H 2020
- Phone prices expected to drop for mid-range models and scale (e.g. China)

© 2020 Nokia

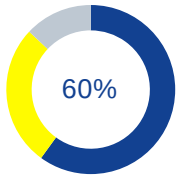
TOP10 5G Use cases of Top 15 Frontrunner 5G customers

Updated 15th Oct. 2020



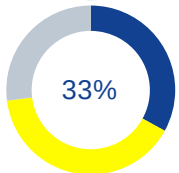
Hotspots and venue

Stadiums, Flag store



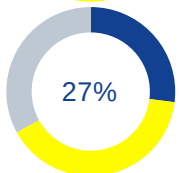
5G FWA

5G Home mobile broadband



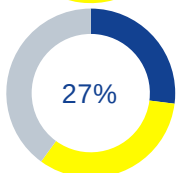
Wide area HD+ Video Streaming

Video Streaming



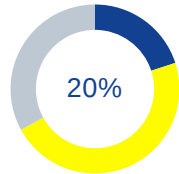
Enterprise campus

Shopping malls



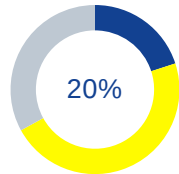
Cloud Gaming

eSports, Streaming Games, Azure, Hatch, Google Stadia



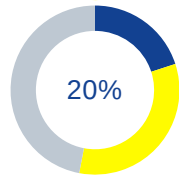
Mixed Reality AR

Training systems, Theme parks, 360 hologram video (Note: excl. UrLCC)



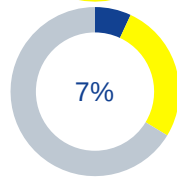
Industrial automation

(Note: excl. mMTC & UrLCC)



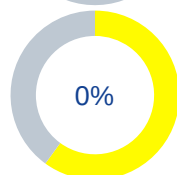
Video surveillance

Static, Drones, vehicles



Collaborative Automated Robots

Manufacturing plant, e.g. Automotive



Factory automation

AGV, connected devices

Launched
Planned
No plan

© 2020 Nokia
Nokia internal use
NOKIA

Summary

1. 5G is ready and is the tool for growth and productivity increase
2. Every day new use cases are developed, tested and now in operation
3. Ecosystem is ready and evolving

© 2020 Nokia