

5G: From vision to reality



Business
Landscape
and
Mobility Trends

Strategic Telco
Positioning
in the new
value chain

5G
The Consumer
perspective

Industry
digitalization
Business
Potential
5G

Riccardo Mascolo
Head, of Strategy and Business Development
Italy and South East Mediterranean
Ericsson

Ericsson in Italy

Global experiences and local competences

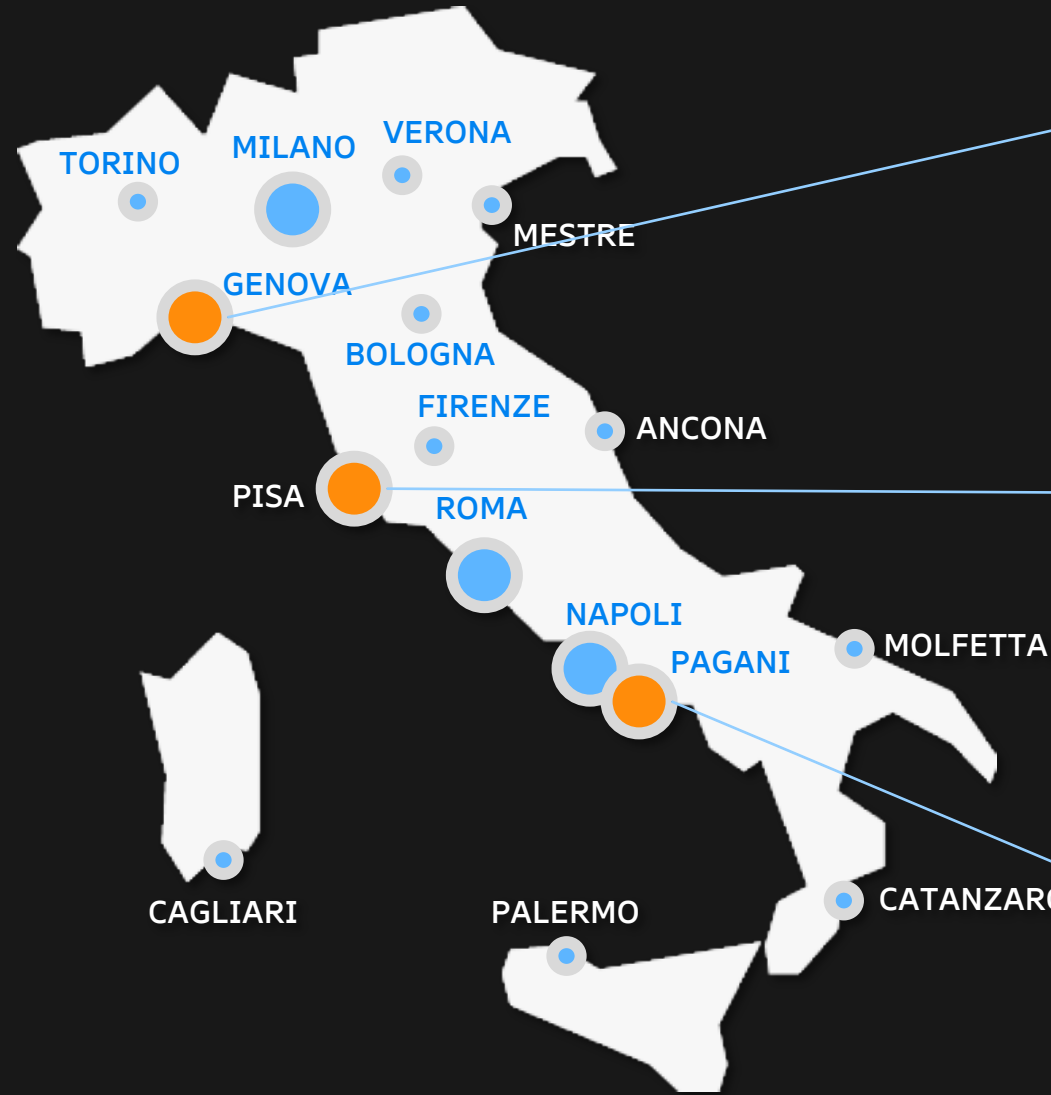


3.000 Employees
- of which 700 R&D

55%
University Graduates

3
R&D Centers

5G development
@ Italian R&D Centers



R&D Networks

Innovation Research

R&D Digital Services and Security

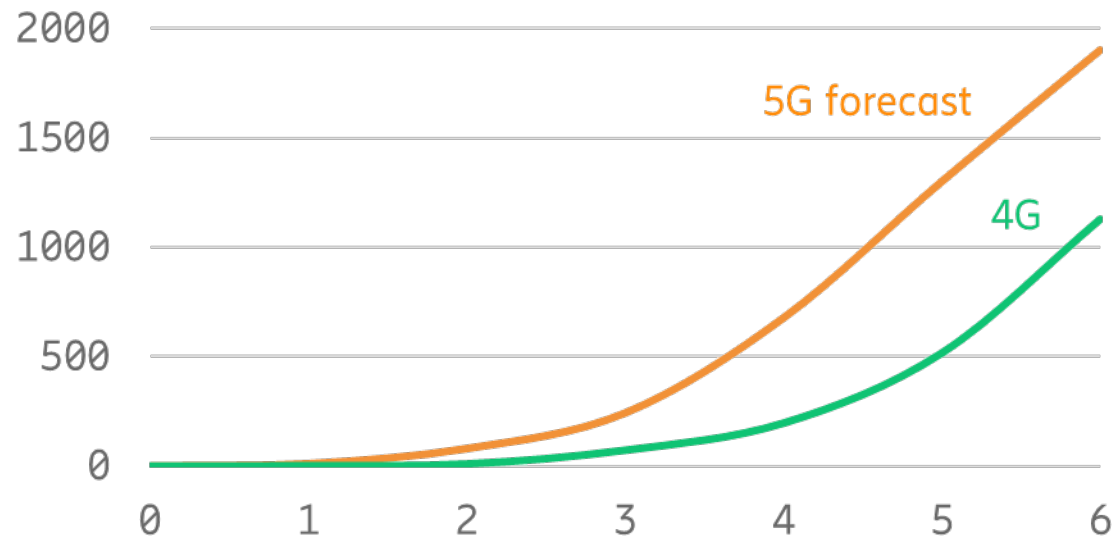
changing the game



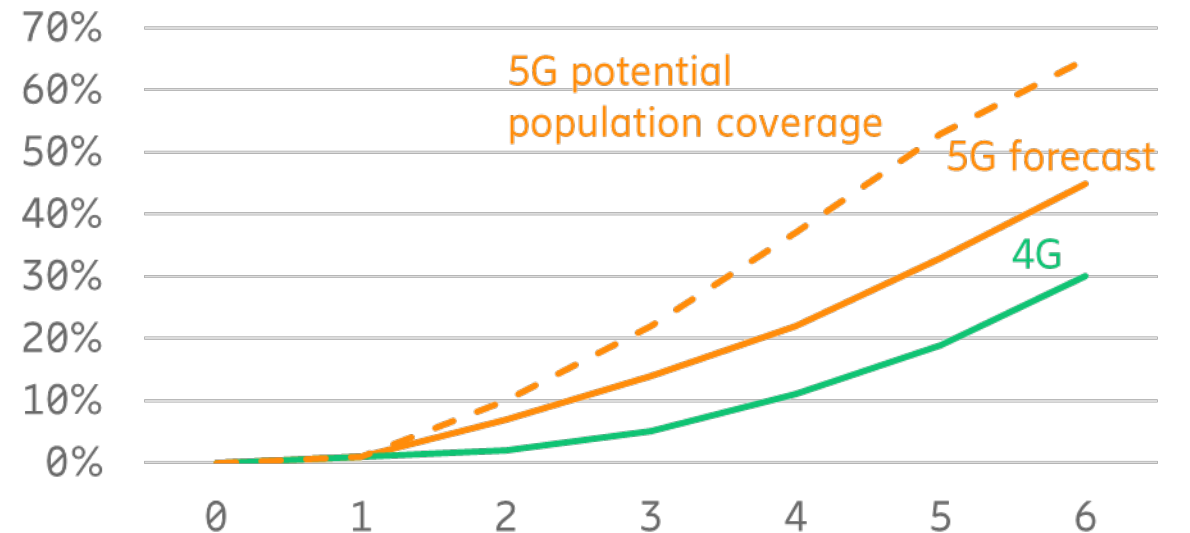
5G uptake expected to be faster than 4G



Global subscriptions (million)



Global population coverage (percent)



Year from first deployment:
- 4G in 2009
- 5G in 2018

In 2024 , 5G subscriptions will have reached 1.9B subscriptions globally

In 2024 , up to 65% of the world's population may be covered by 5G by leveraging Ericsson Spectrum Sharing

5G insights by 2025

Ericsson Mobility Report



5G

By 2025, we expect 5G to ...

2.6bn

... reach 2.6 billion subscriptions ...

45%

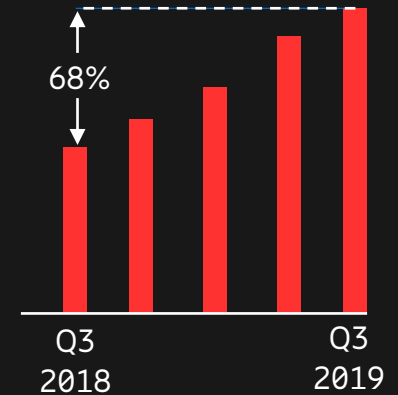
... generate 45 percent of the total mobile data traffic...

<65%

... cover between 55 and 65 percent of the world's population

68%

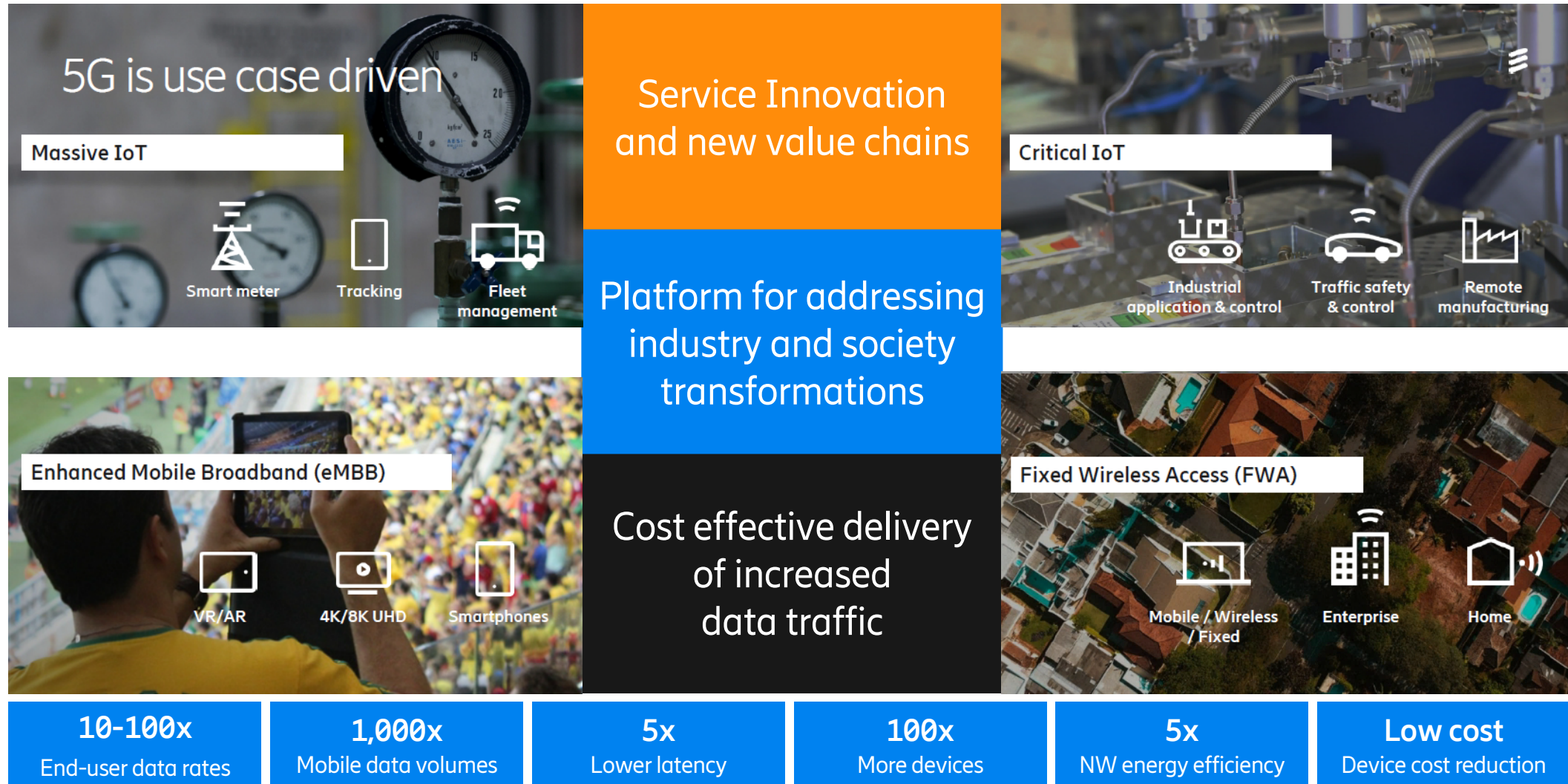
In Q3 2019 mobile data traffic grew 68% year-on-year



5bn

There will be 5 billion Cellular-IoT connections in 2025, out of which Critical IoT predicted to account for 25 percent

The value of 5G for consumers and industry



Strategic Telco positioning in the new value chain



Connectivity and Infrastructure Provisioning

- Voice and Connectivity Services
- Mobile and Fiber UBB access network
- Hosting, CDN, SD WAN,
-

Service Enablement

- Enhanced Private Network
- Slice Management Service
- Massive and secure Device Management
- SDK and Capabilities Exposure
- Sensors Data Collection and Analytics,
- Security
- ...

Application & Service Life-Cycle and Maintenance

- Industrial Specific Applications Catalogue, Partners and SI
- Global Integrated Solutions
- AI and Machine Learning as-a-Service
- Security Monitoring and Operations
- Solution Life-cycle and maintenance
- ...

Service Providers

Network Developer

Direct

Service Producer

Service Enabler

Direct and through Partners

Vertical Ecosystem

Service Creator

Direct

GO TO MARKET SALES MODEL



The value of 5G for consumers and industry



Consumer



In the near term, consumers expect 5G will offer benefits



Consumers see value in 5G use cases and are willing to pay

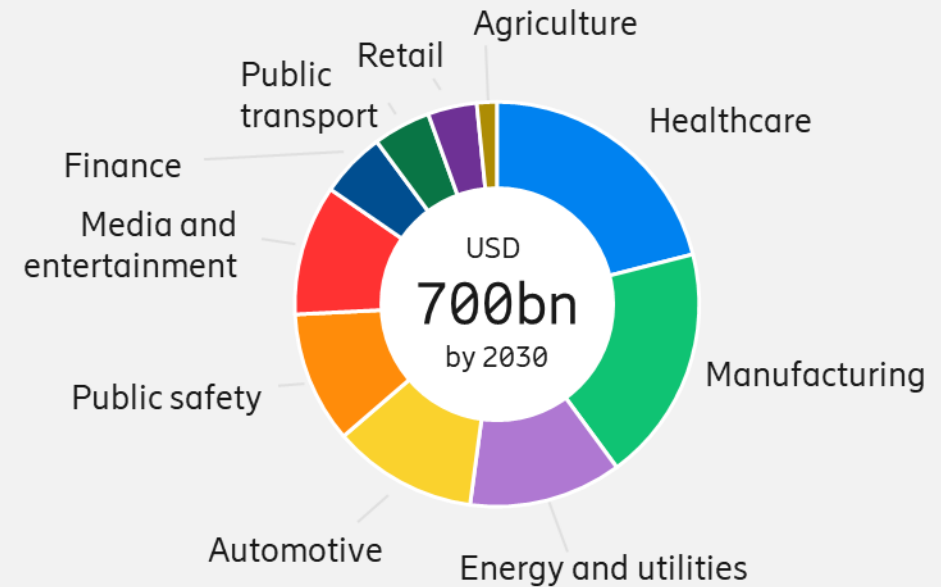


Consumers predict 10x data usage increase on 5G by 2025

Source: Ericsson ConsumerLab report, 5G consumer potential, May 2019

Industry

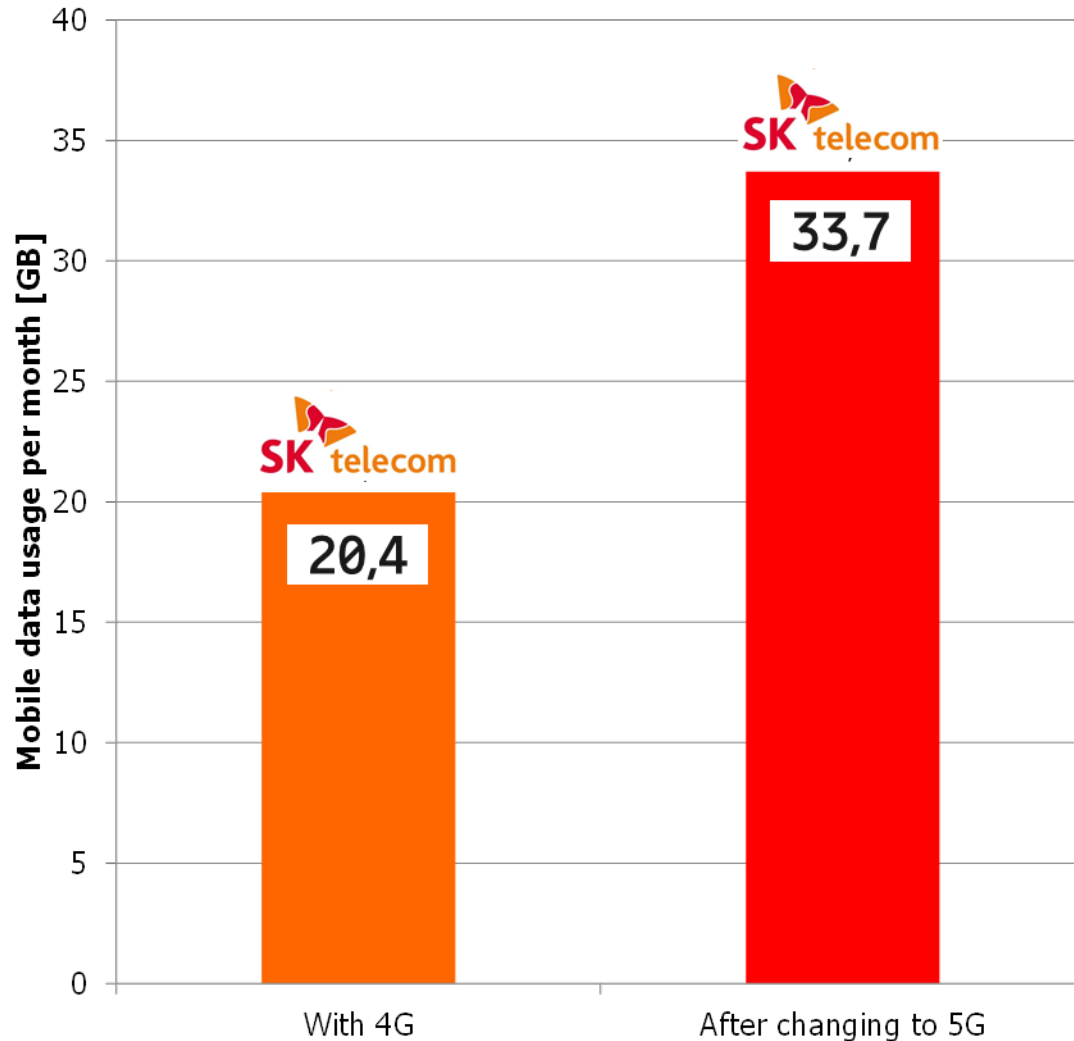
Industry digitalization potential
5G investment by 2030



Source: Ericsson and Arthur D. Little, The guide to capturing the 5G industry digitalization business potential, 2018

SK Telecom: 65% growth in data usage

For customers upgrading from 4G to 5G

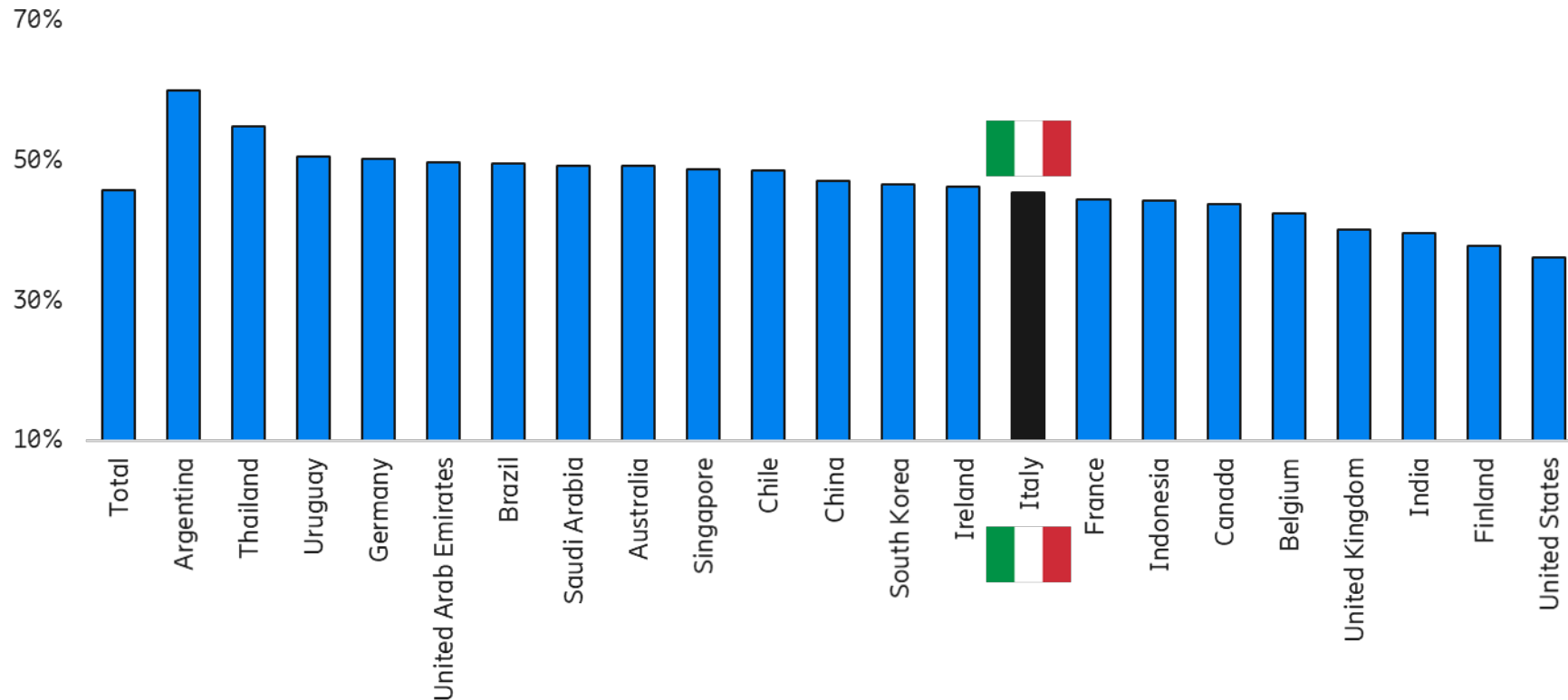


- Video: +130% from 4.3 GB to 9.8 GB
- Time on Wi-Fi: -37% from 4.3 to 2.7 hours
- Mobile VR: 15x more
- 'Jump VR': 8x more


Consumers expect to be able to stream videos seamlessly wherever they are



Share of smartphone users that rated their mobile broadband connectivity as not fast enough

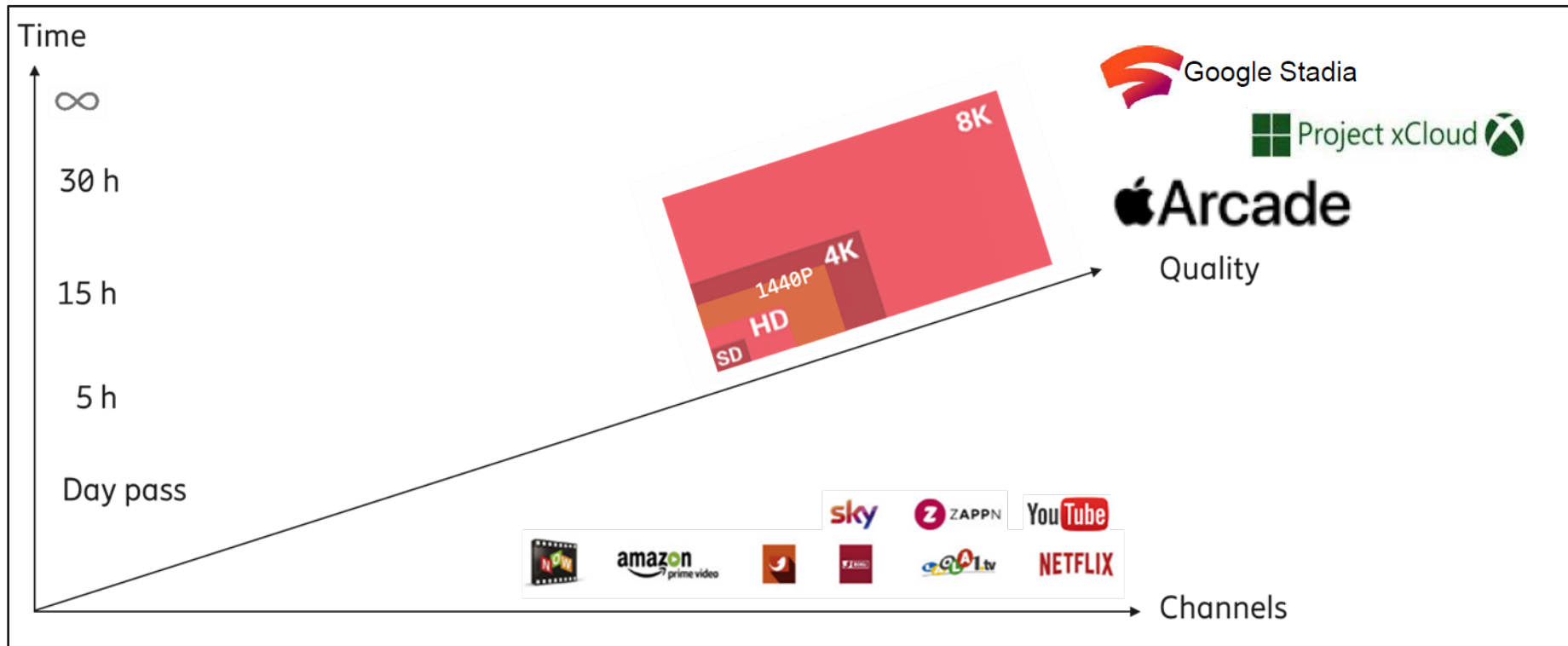


4 in 10 globally do not find mobile broadband speeds to be fast enough.

45% in Italy say they do not find mobile broadband speeds to be fast enough 

Base: Smartphone users aged 15–69 across 22 markets
Source: Ericsson ConsumerLab 5G Consumer Potential Study, May 2019

Streaming goes mainstream: nonlinear, and on demand, everywhere



Consumers
are asking
for a step
change
in network
performance

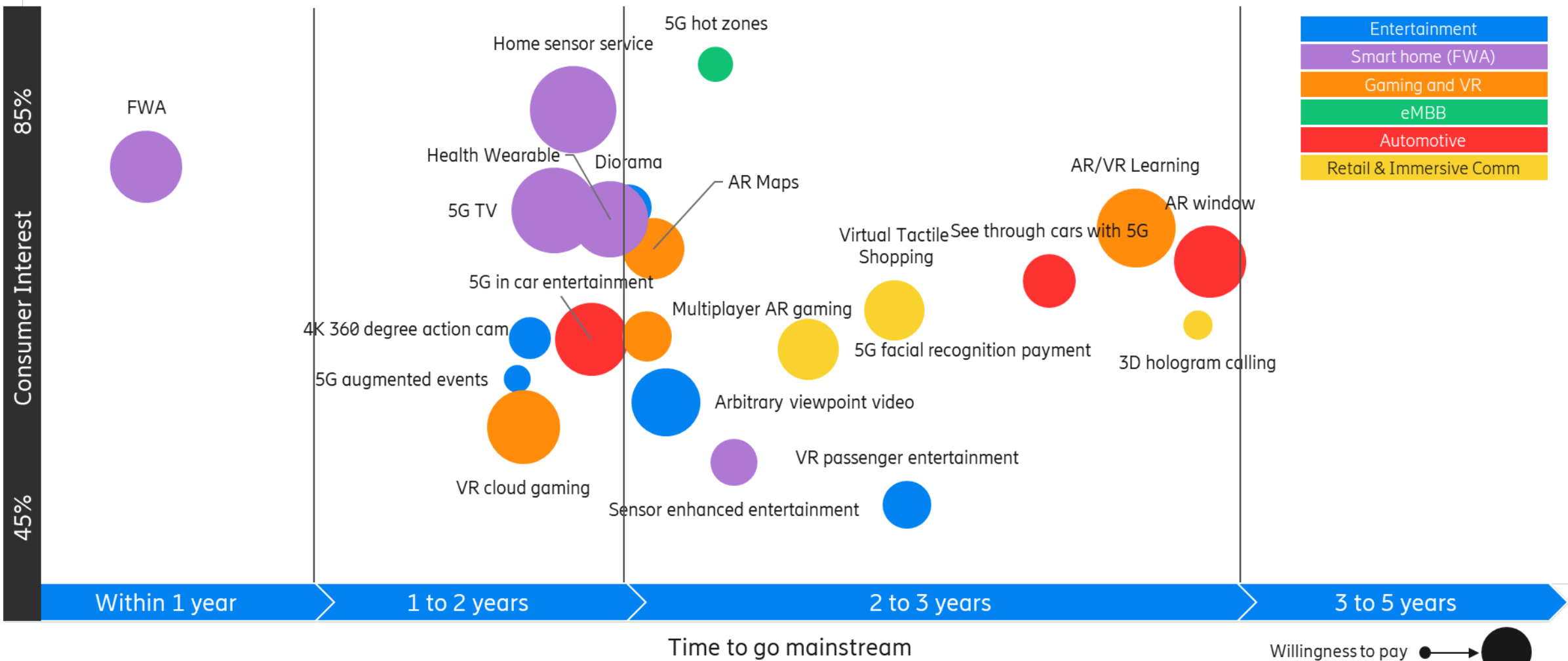
— Consumers are excited about the new 5G technology

The most important 5G benefit to consumers is improving mobile video streaming quality, eventually moving to ultra-high-definition (UHD) format as it becomes available.

57%

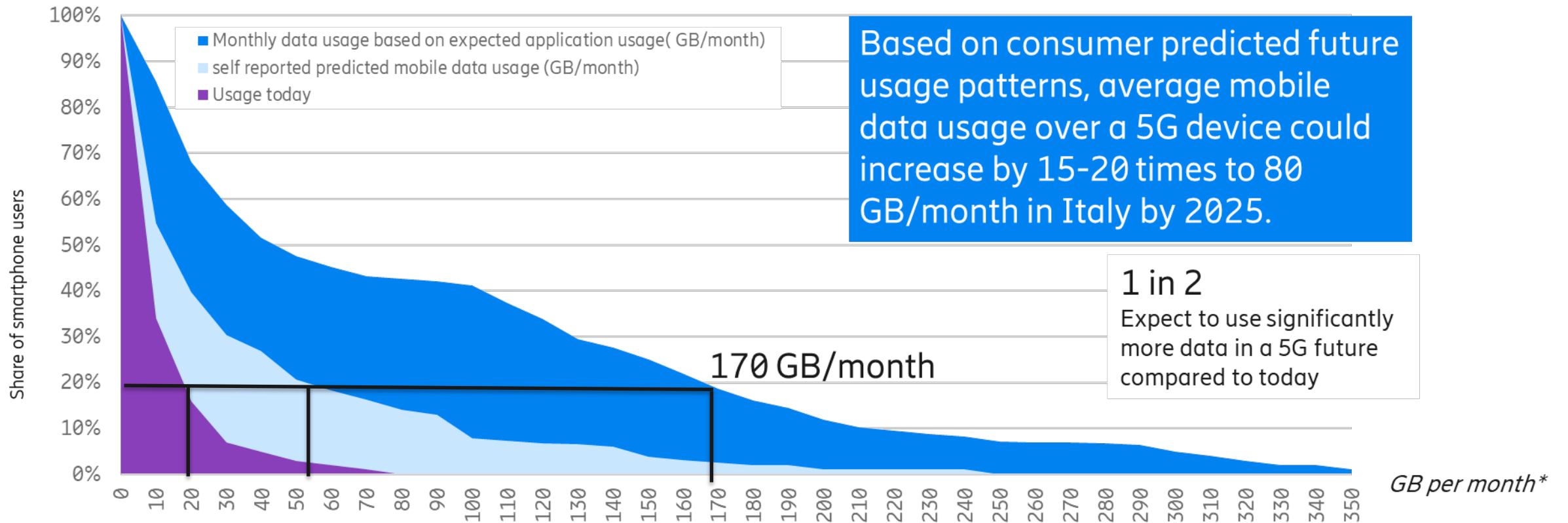
of surveyed consumers
are excited about enhanced
video streaming over 5G

Cloud Gaming, Immersive Event Experience, Smart Homes expected to go mainstream within 2 years of launch



Base: Smartphone users aged 15-65 Source: Ericsson ConsumerLab, 5G Consumer Potential, 2019

Smartphone users with heavy usage could use 170 GB or more a month on 5G by 2025



Base: Smartphone users aged 15-69
Source: Ericsson ConsumerLab 5G Consumer Potential Study, May 2019

*based on selfreported expected future usage of services combined with Ericsson Mobility calculator on the Gb needed to run these services respective Selfreported survey results

The value of 5G for consumers and industry



Consumer



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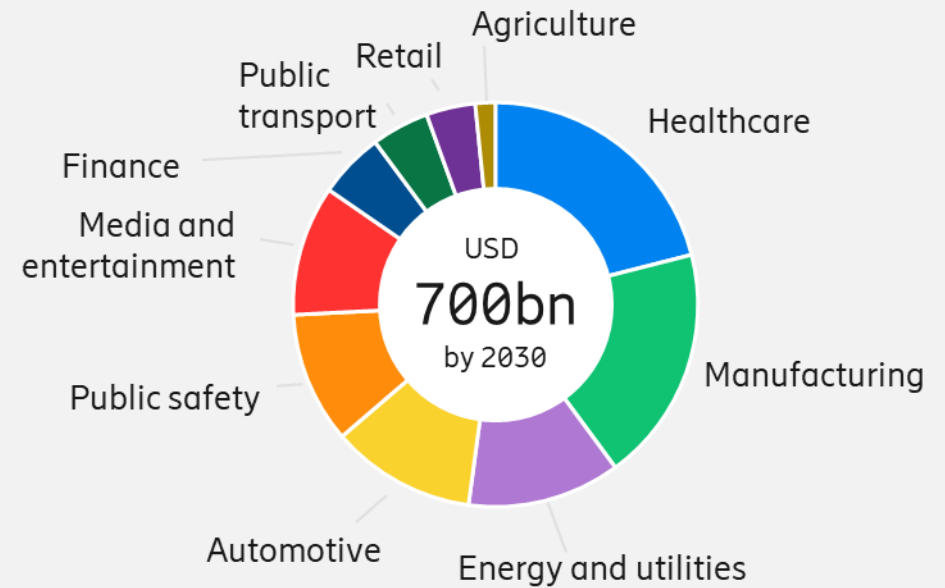


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Industry

Industry digitalization potential
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Source: Ericsson and Arthur D. Little, The guide to capturing the 5G industry digitalization business potential, 2018

Industry digitalization will transform all industries

Cellular IoT evolution and segments



Commercial – Growth

Early pilots & standardization

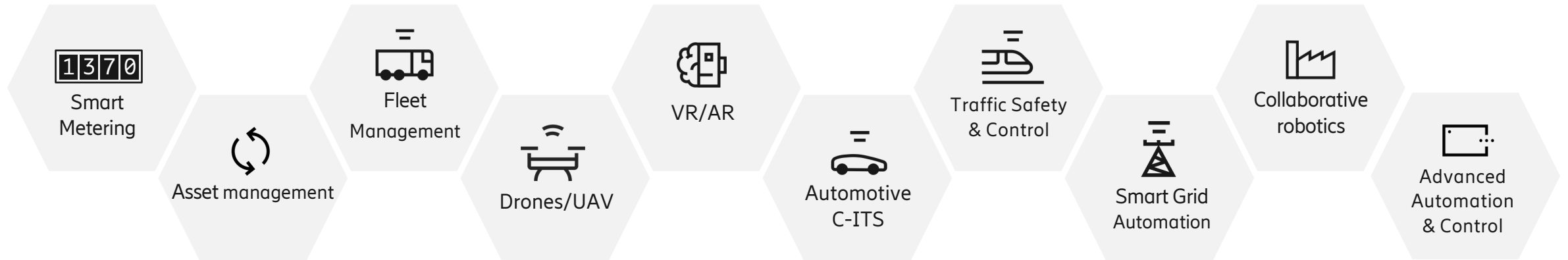
Massive IoT

Broadband IoT

Critical IoT

Industrial Automation IoT

One network – multiple use cases and industries



<	Low cost devices, low energy Small data volumes Massive numbers NB-IoT/Cat-M1 (LTE and NR)	High throughput Low latency Large data volume LTE + NR	Ultra reliability Ultra low latency Very high availability NR	Industrial protocols Time sensitive networks Precise indoor positioning NR	>
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Near term roadmap

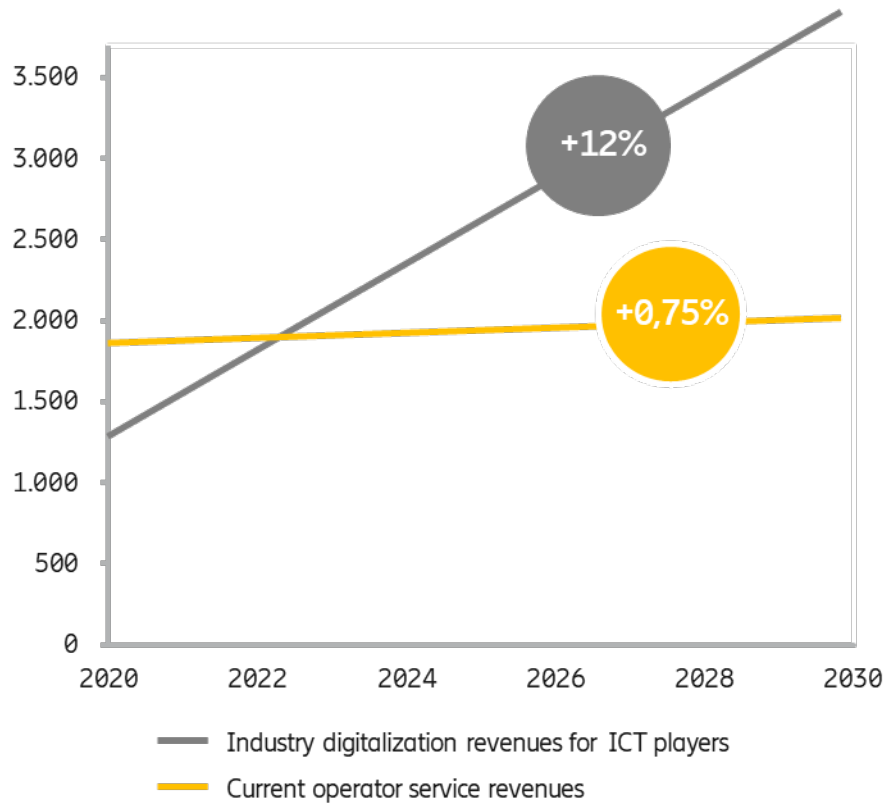
Long term roadmap: Future 5G use cases

The service provider challenge and potential

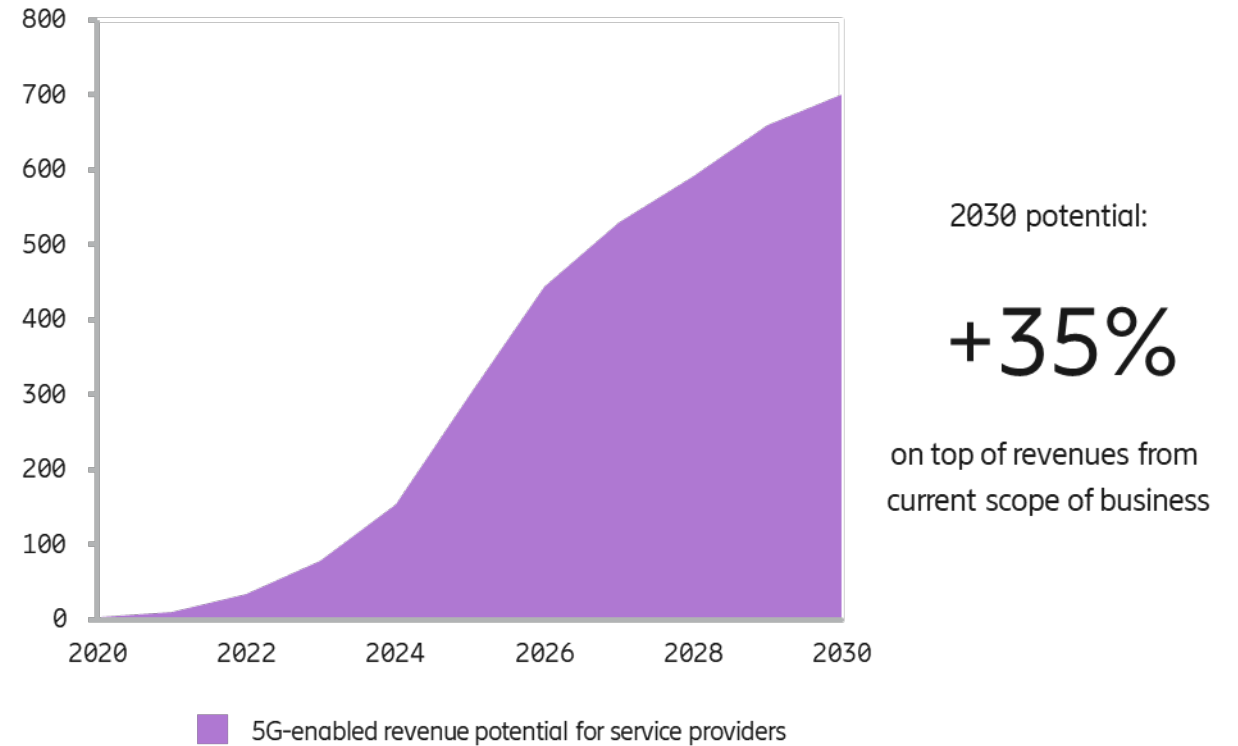
- Critical to capture the growth in the next 5-7 years



USD bn,
CAGR 2020-2030 %



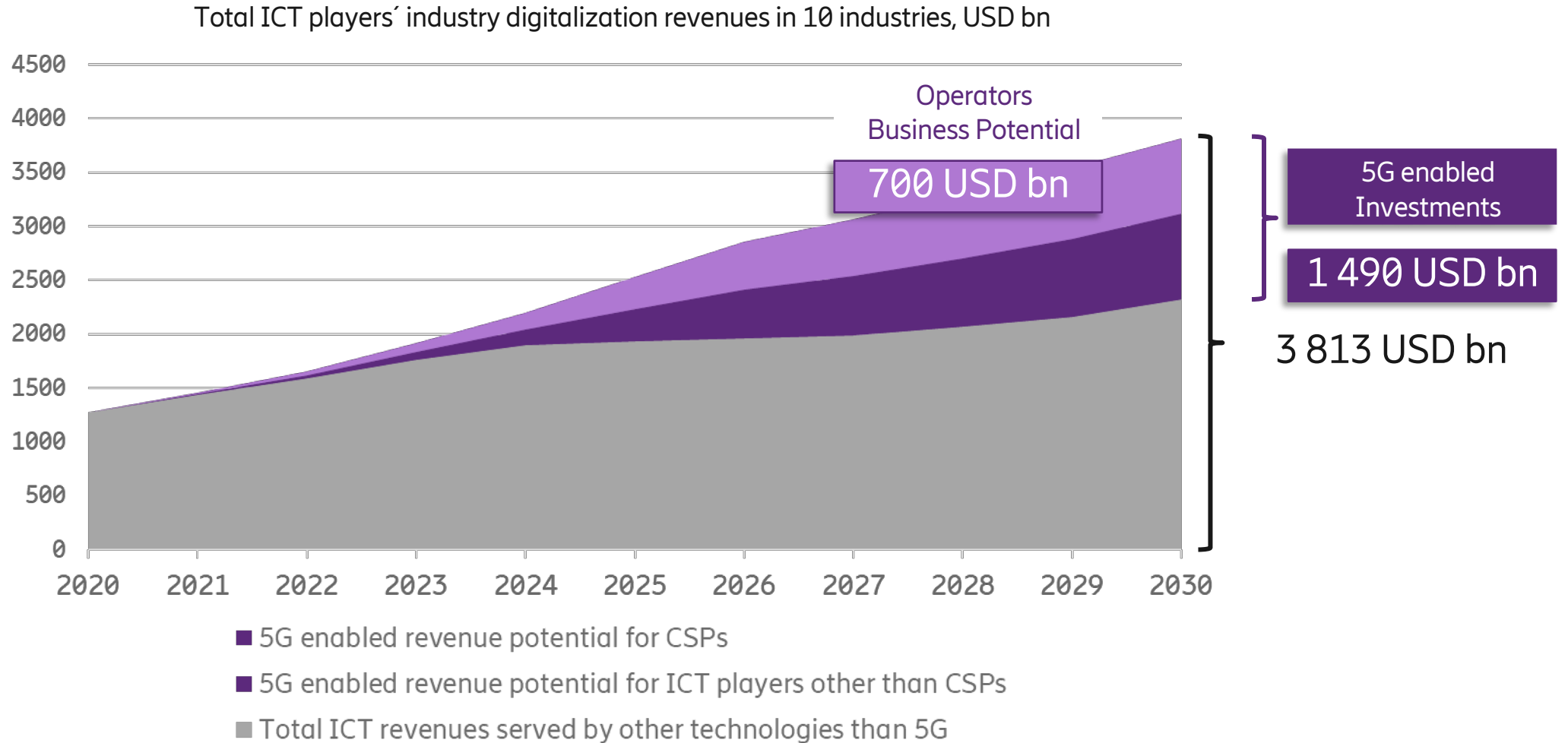
Service provider addressable
Service creator role
USD bn



Source: Ericsson and Arthur D. Little

5G fuels digital transformation across industries

Investments driven by the value 5G is providing across industries is expected to be around USD 1.5 trillion in 2030



5G is a game changer for Industrial IoT!



Public Safety



Rail



Utilities



Defense



Oil & Gas



Sea Ports



Air Ports



Hospitals



Stadiums



Campus



Warehousing



Mining



Manufacturing



• Dedicated Networks to power Industry transformation

OPTIMIZED



Dedicated and reliable networks optimized for local services and specific industrial applications

DEDICATED



Local network, independently managed and easy to deploy

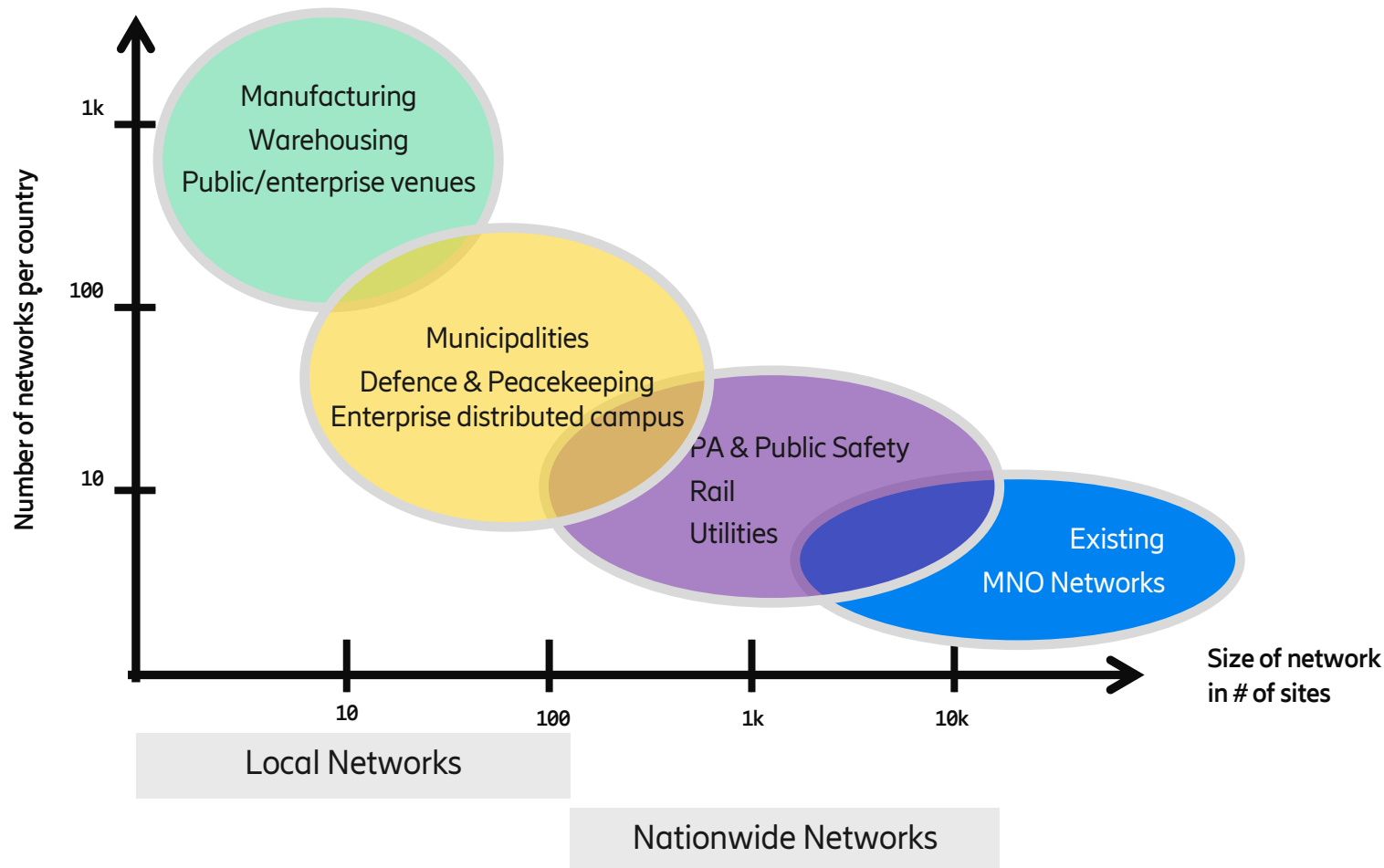
SECURE



Network with cellular-grade security that keeps sensitive data local on the premises.

Enhanced connectivity for the new age of industry

Dedicated Networks to power Industry transformation



Network built for the service instead of service built for the network

Specific E2E design and operation processes to satisfy each family of dedicated network

Differentiators

Guaranteed coverage

Ensured capacity

Survivability

Retained control

Of the total 5G enabled value in 2030, up to 47% is addressable by operators



2030

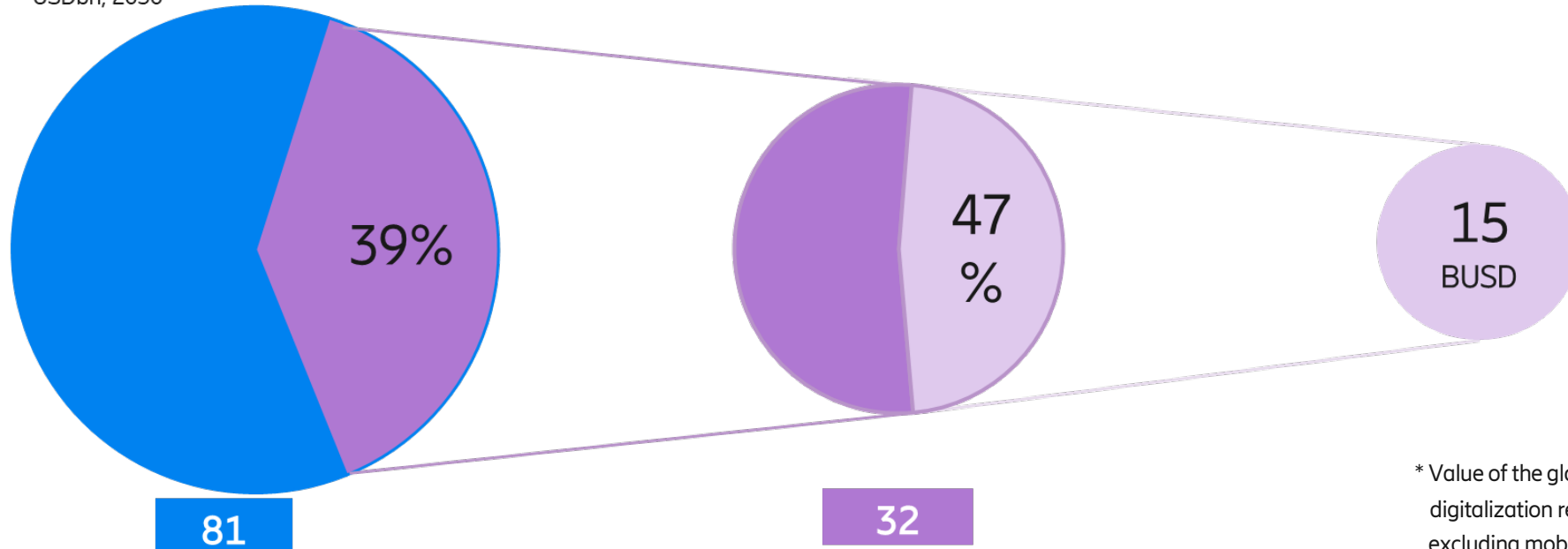
5G Business Potential 2019

Industry Digitalization ICT investments

5G enabled Business Potential

Total operator addressable 5G for Business market*

• USDbn, 2030



Industry digitalization ICT investments
5G enabled digitalization investments

5G enabled business potential
5G operator addressable revenues

* Value of the global total addressable 5G for Business digitalization revenues market across 10 industries, excluding mobile broadband

Source: Ericsson and Arthur D. Little

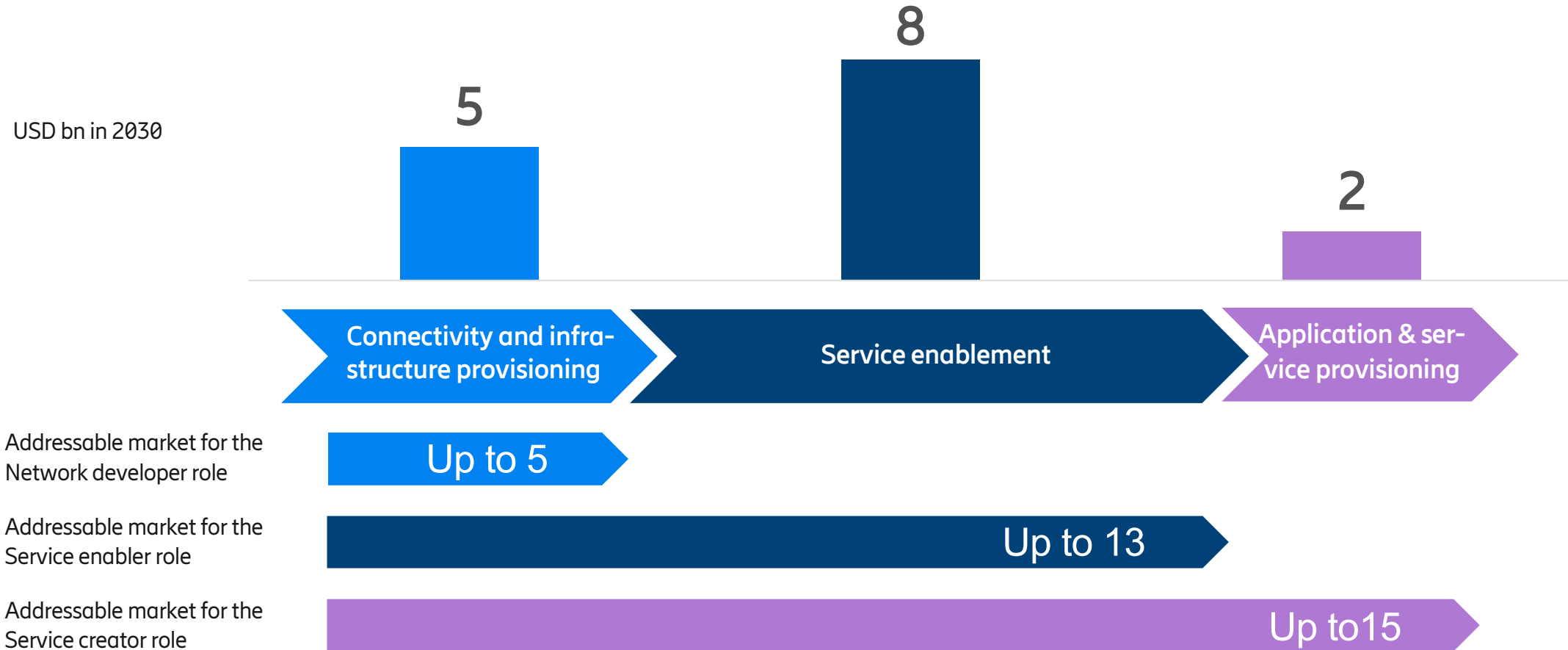
Healthcare	Manufacturing	Energy and Utilities	Automotive	Public Safety
Media/Entertainment	Financial Services	Public Transport	Retail	Agriculture

Significant potential for operators to expand into the service enablement layer



2030

5G Business Potential 2019

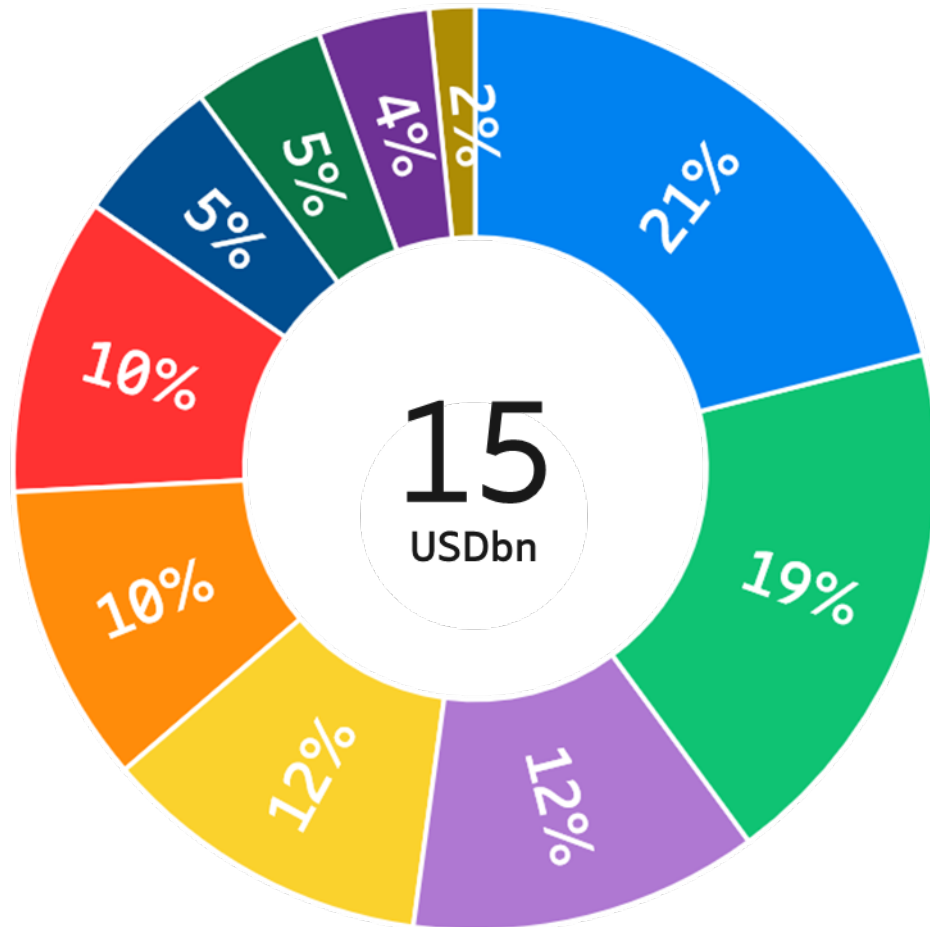


Operator Business Potential Industry View



2030

5G Business Potential 2019



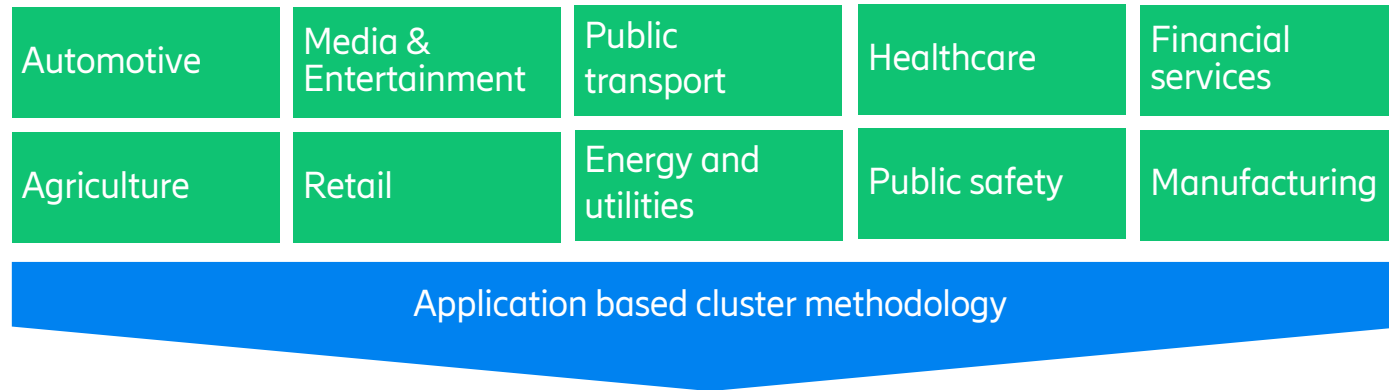
- Healthcare
- Manufacturing
- Energy and utilities
- Automotive
- Public safety
- Media and entertainment
- Financial services
- Public transport
- Retail
- Agriculture

BUSD	% of Total
3.1	21%
2,8	19%
1,8	12%
1,7	12%
1,6	10%
1,6	10%
0,8	5%
0,7	5%
0,6	4%
0,2	2%

5G-IoT use case clusters



+200 use cases in 10 industries



Go-to-market challenges

- Business and monetization model
- Value chain positioning
- Role in ecosystem
- Partnership development

Enhanced video services

Monitoring and tracking

Real time automation

Smart surveillance

Autonomous robotics

Hazard and maintenance sensing

Augmented reality

Connected vehicle

Remote operations

Deployment challenges

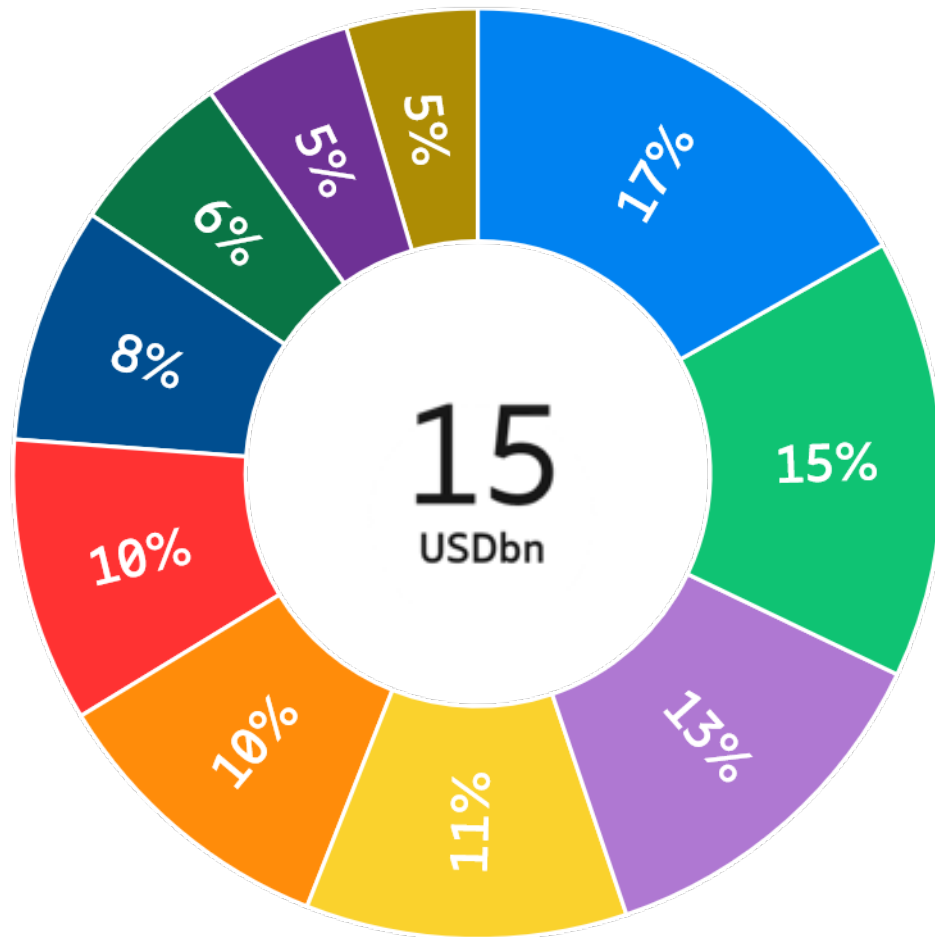
- Technical performance criteria
- Enterprise networks/Indoor
- Device, network, computing and service enablers

Operator Business Potential

Service Cluster View



5G Business Potential 2019



- Enhanced video services
- Real-time Automation
- Connected vehicle
- Other
- Monitoring and tracking
- Hazard and maintenance sensing
- Autonomous Robotics
- Remote operations
- Smart Surveillance
- Augmented reality

BUSD	% of Total
2,5	17%
2,3	15%
1,9	13%
1,7	11%
1,5	10%
1,5	10%
1,2	8%
0,9	6%
0,8	5%
0,7	5%

Ericsson 5G in action



Manufacturing

5G for Vehicle Production

Customer: Audi

The Challenge
Current Wi-Fi solutions do not fulfil requirements regarding reliability, device handling and handover. Ethernet cables are inflexible and need regular maintenance to avoid service interruption.



The Solution
Private 5G deployment in Bond n78 (3.4-3.8GHz), ADR 648B, RDS 4479, eUSS and integration into factory mission critical ICT infrastructure and Manufacturing Execution System (MES).

The expected results
5G non-public network for industries implemented at a shop floor, will enable controlling of robots, steering of AGVs, firmware download to vehicles and connecting a large amount of devices with pervasive connectivity and low latency.

Partners

- Audi



Mining

Unmanned mining machines increases production time

Customer: Boliden

The Challenge
Production in an underground mine usually stops at least once a day for blasting. On top of the actual blasting, the stop time is divided into:
- Entering mine
- Wait for dust to settle and air quality to be safe for humans
- Re-entry to mine and start-up production

Each stop can take about several hours for each face and only this:

"The gain with autonomous transports is that they can continue even with gas residues in the mine. This makes us believe we can increase the efficiency with 20%."
Peter Burman - Boliden

Translated from Swedish article

<https://www.ericsson.com/en/press-releases/2022/02/02/ericsson-5g-enables-remote-control-of-mining-machines>



Solution

With autonomous and remote-controlled machines operated on an Ericsson LTE network with high reliability and performance:
- There is no time spent evacuating the mine
- Waiting for the dust to settle and air quality to improve can be significantly shortened
- There is no time spent on re-entry to mine and start-up of production

Expected result

Assuming 2 hours saved every day on a 20 hour schedule means an increase of 10% on production and revenues.

Partners

- Epirac
- Volvo CE

Smart Ports

5G Smart Harbor Port Qingdao

Customer: Ustc

The Challenge

The Port of Qingdao is among the top ten busiest ports in the world. Need full automation for increased safety and efficiency by real time data traffic from more than 30 high-definition cameras. Require millisecond-level latency control signals, as well as stable, remote and real-time control of cranes.



The Solution

Remote control of cranes with dedicated private network, 5G NR radio and core on premise.

The Result

One of the key findings of the field trial is up to 70 percent of labor costs can be saved when a harbor uses the 5G automation.

Partners

- China Unicom
- Port Qingdao
- Shanghai Zhenhua Heavy Industries Co., Ltd

Autonomous Transport

Connected Autonomous Transports

Customer: E/NRIDE

The Challenge
Increased global transportation demand which driver supply cannot cater for. Reduce emissions, transportation accounts for 21% of global emission.



The Solution
5G connectivity, Connected Vehicle Cloud solutions, electrified vehicle technology, self-driving technology.

The Result

- A complete connected autonomous transportation service. The world's first operational fully autonomous electric truck on public road.
- Reduced operation cost by 60% and 90% reduction in CO2 emissions and the elimination of nitrogen oxide (NOx) emissions.

Partners

- E/NRIDE
- DB Schenker

Smart Utilities

Wireless energy grid protection

Customer: ABB

The Challenge
Energy grid protection units using fiber communication is many times costly and inflexible. Replacement of fiber sometimes infeasible demands.

"Dustin"

Quelle: source



The Solution

4G/5G communication for ABB RED 615 protection units. LTE with local breakout and NR explored.

The Expected Result

Substantial fiber deployment costs can possibly be avoided. Feasibility tests in ABB 5G lab using LTE with local breakout and optimized latency configuration. Capacity evolution using 5G NR for a regional deployment in Sweden.

Partners

- ABB
- RISE

Energy Management

Hitachi

Partner: Hitachi

The Challenge
Lack of real-time data on energy consumption, pipeline failure, and automated tests it requires time-consuming, manual inspection processes, reducing production integrity and yields for involved partners/customers.

"As a plant manager, I can't ensure product quality and production line performance due to a lack of insights into manufacturing process & machine health."
Lars Olsson
Plant Manager, EVO Yalova Factory



The Solution

- Ideal Energy

The Result

- Real-time VP dashboard

Partners

- Hitachi
- Local MNO

In summary

- **5G is a game changer**

new players, new value chains, new roles


- **5G for consumer is not only lower cost per GB**

consumers are looking for new applications and services with a premium experience that 5G can enable

- **5G fuels digital transformation across Industries**

Ericsson eyes 15 B USD 5G growth opportunity for Operators in Italy

- **Ericsson is ready to support Operators and Ecosystem to exploit the 5G business potential in Italy**



5G