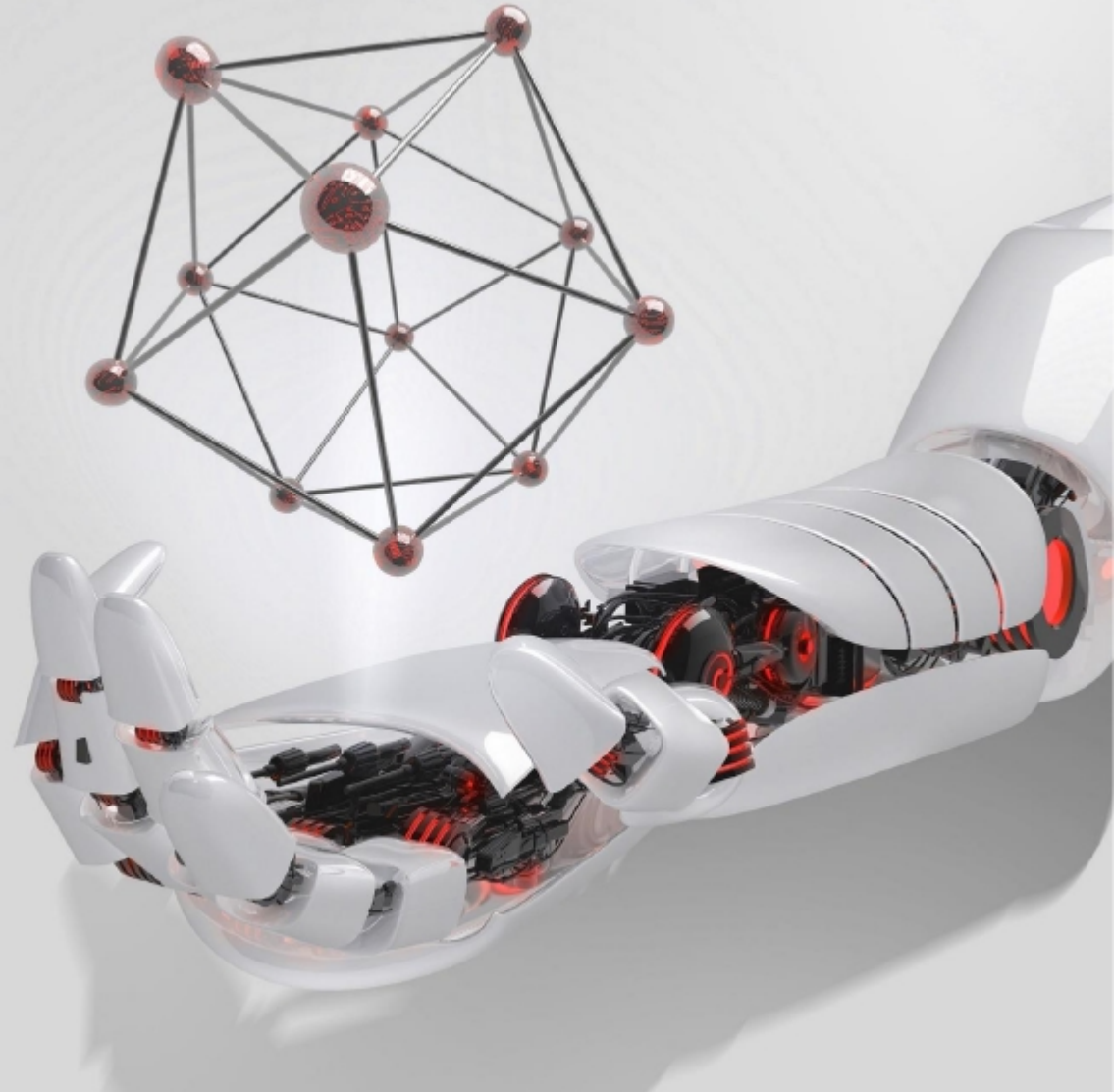


5G, The key Enabler of Digital Transformation

Infocom 2020, Athens 4th Nov 2020

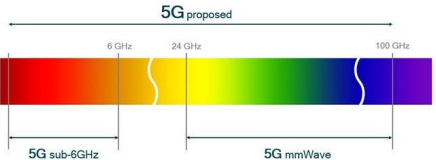
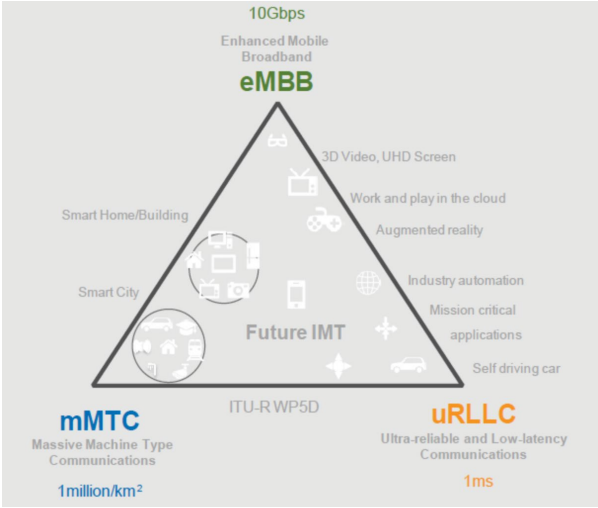
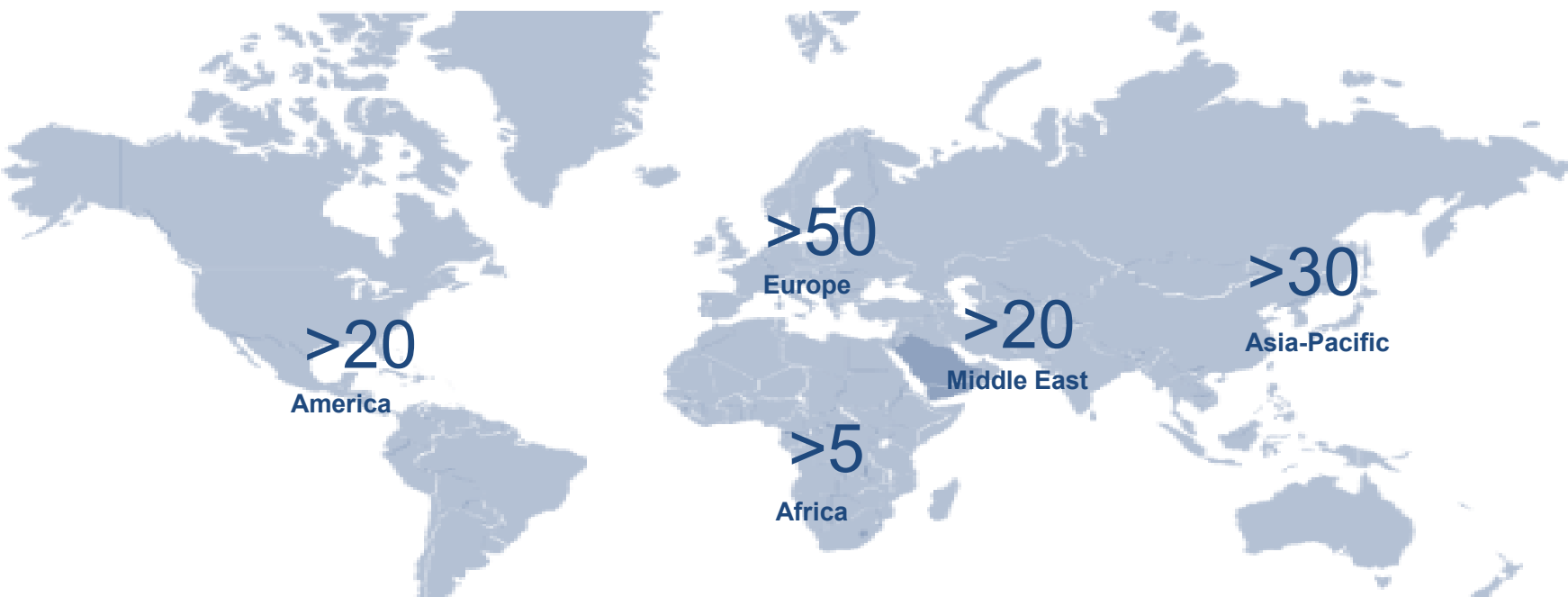
*Vassilis Argyriadis
Chief Technology Officer
Huawei Technologies South Balkan Region*



Building a Fully Connected Intelligent World



5G Is the Foundation for a Fully Connected, Intelligent World



3GPP R16 freeze

Release 16

Latency: further reduced (0.5–1 ms)
Reliability: near-perfect (99.9999%)
Locating: more accurate (meter-level)

110+
commercial networks

100M+
5G users

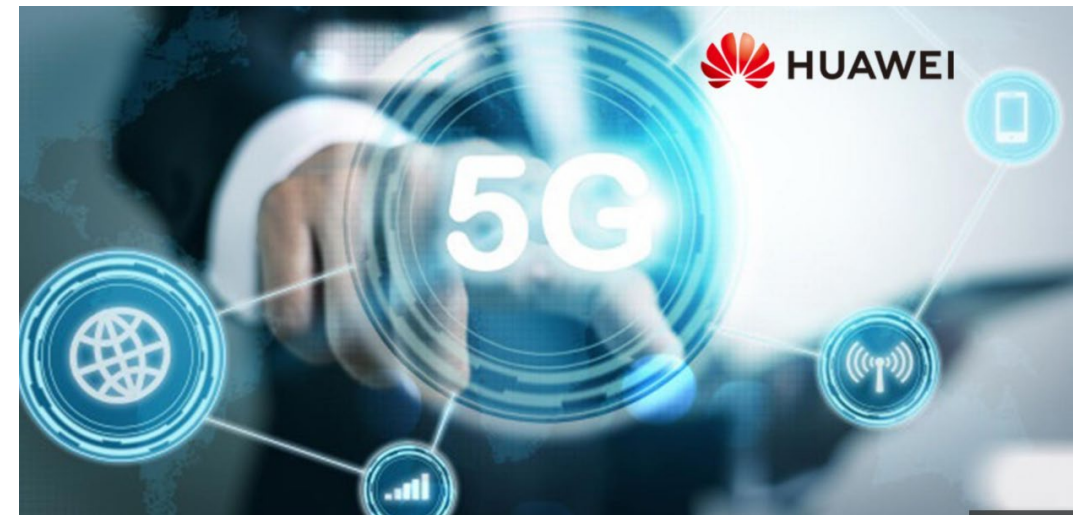
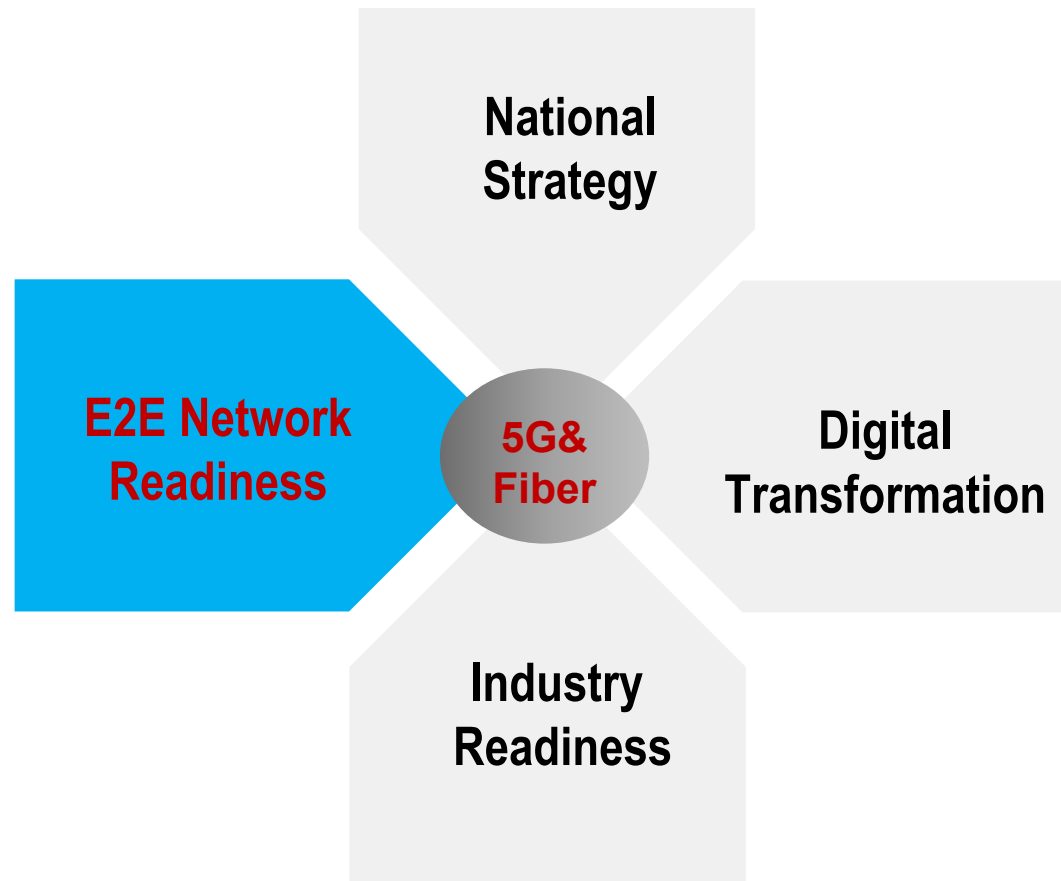
310+ 5G terminals

110+ smartphones

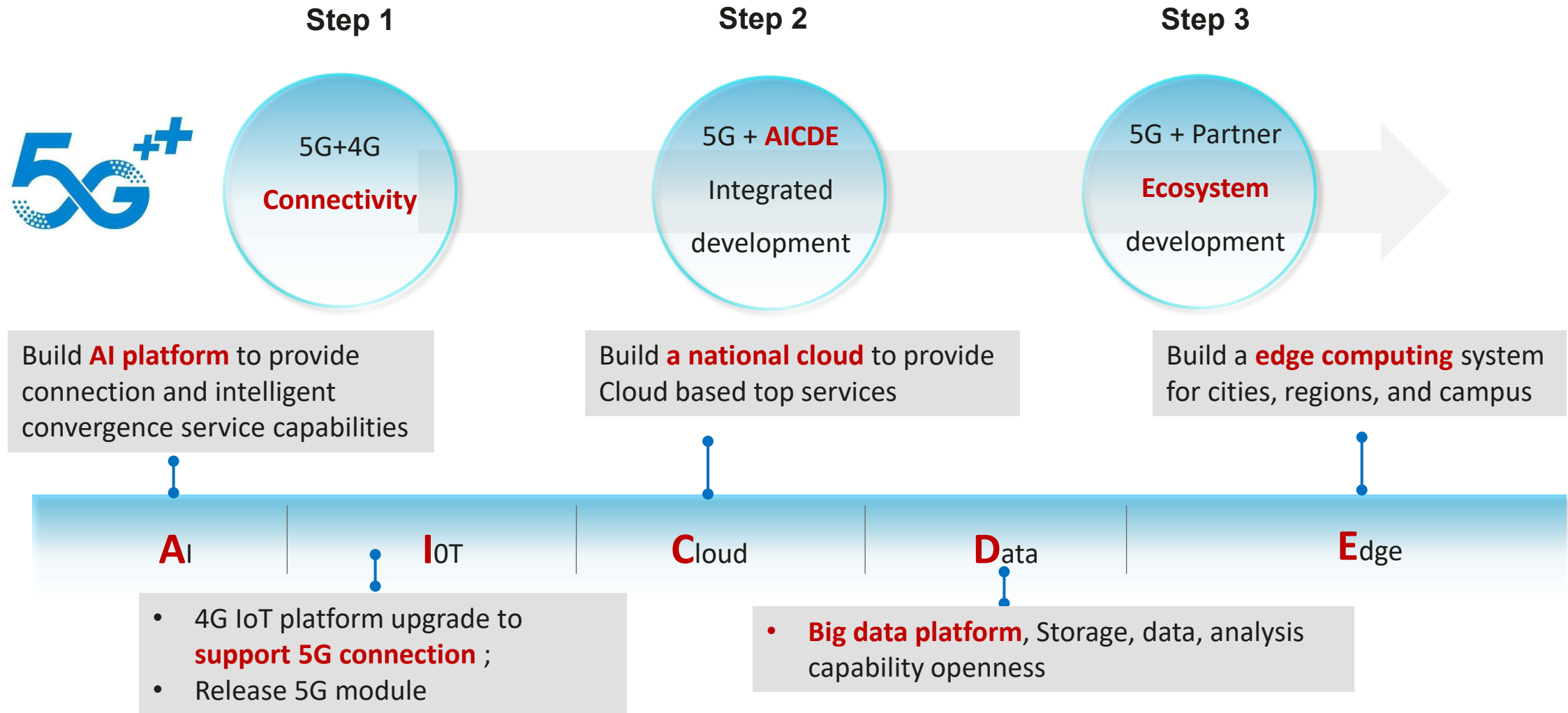
80+ CPEs

45+ industrial modules

Developing infrastructures – E2E view



5G is not only connection, but one E2E network



5G Network Key Architecture Index

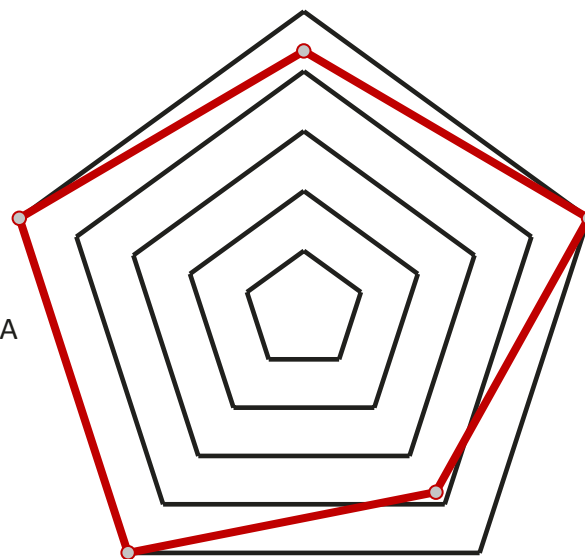
 **Competitiveness**

Fiberization ratio
10G/25G Tx capacity per site
Convergence Ratio
Network slicing

Congestion-free

Always On

Mesh & ring topology
IP protection: IP FRR/TI-LFA
Intelligent OAM
Precision Time Sync.



Simplified

Fabric (Spine-Leaf Network)
SRv6 & EVPN
L3 to edge

Scalable

Capacity Utilization
Programmable Chipset

Intelligent

Smart planning
Auto provisioning
Visualization & forecast


Efficiency

1. Gigabit

- Best and Seamless Connection

2. Determinism

- Guaranteed Experience and SLA

3. Simplification

- Simplified Site, Simplified Architecture...

4. Intelligence

- Autonomous Driving Network

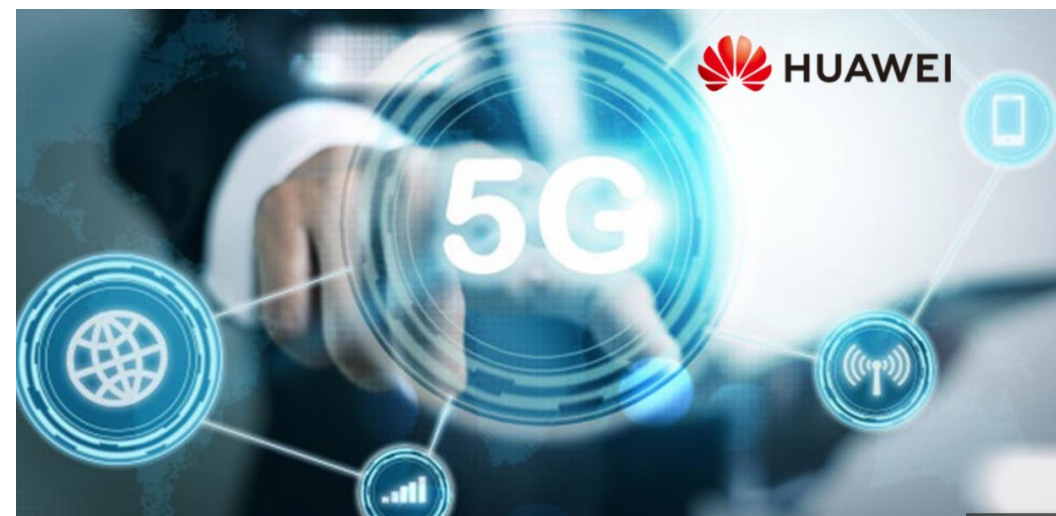
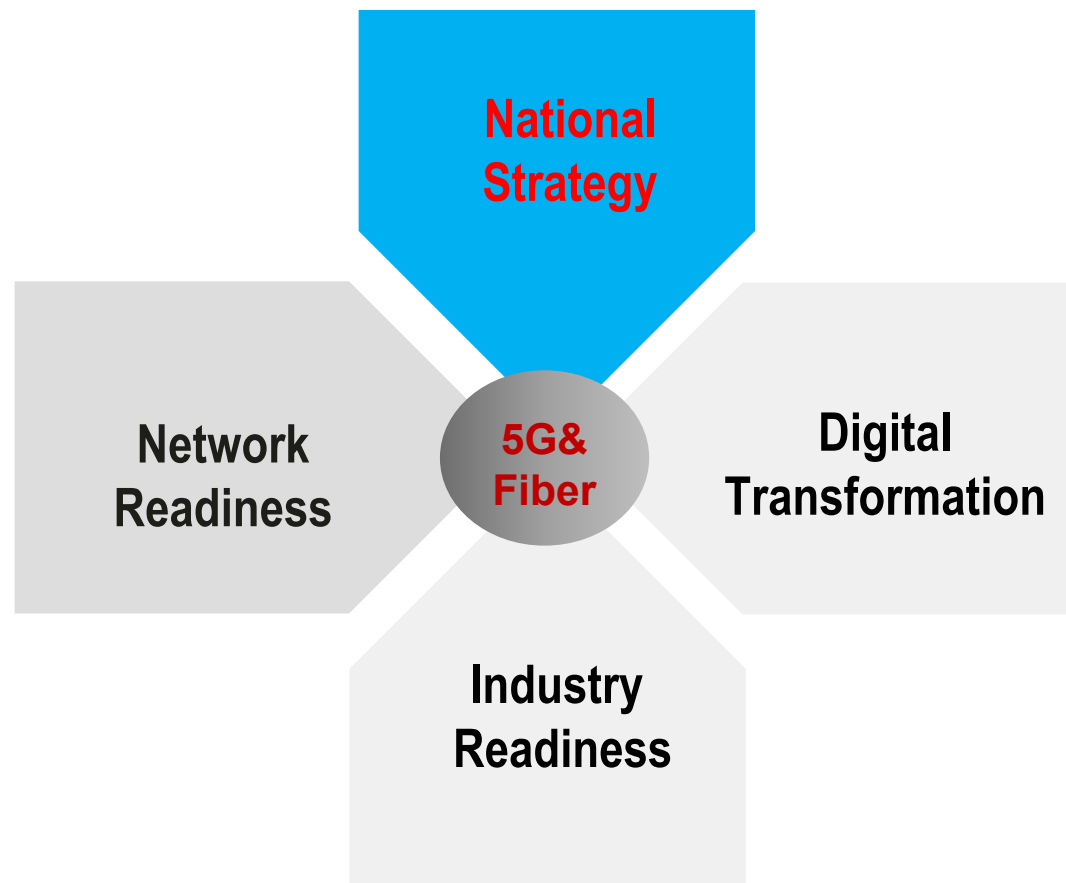
5. Security

- Resilience, Trustworthiness

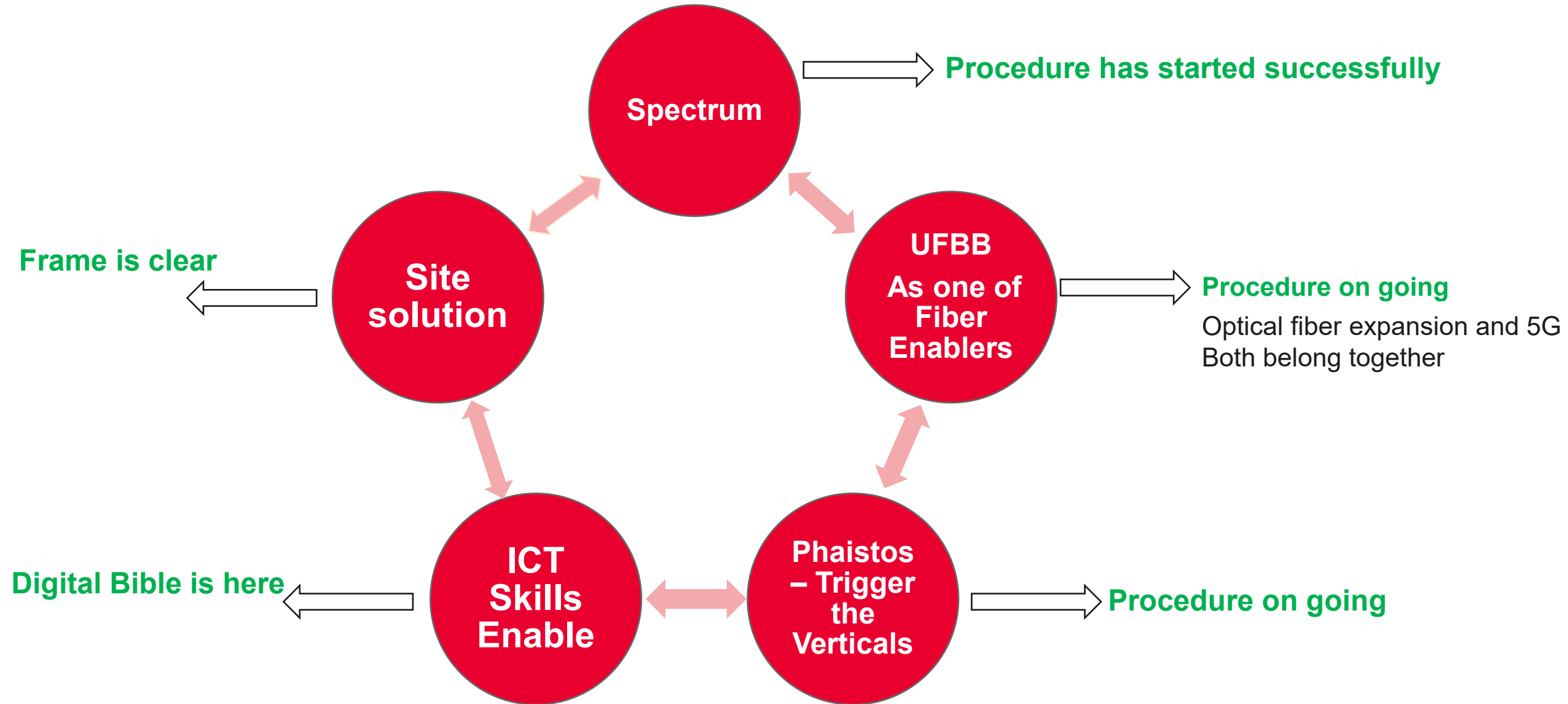
6. Green

- Sustainability, Low Power Consumption

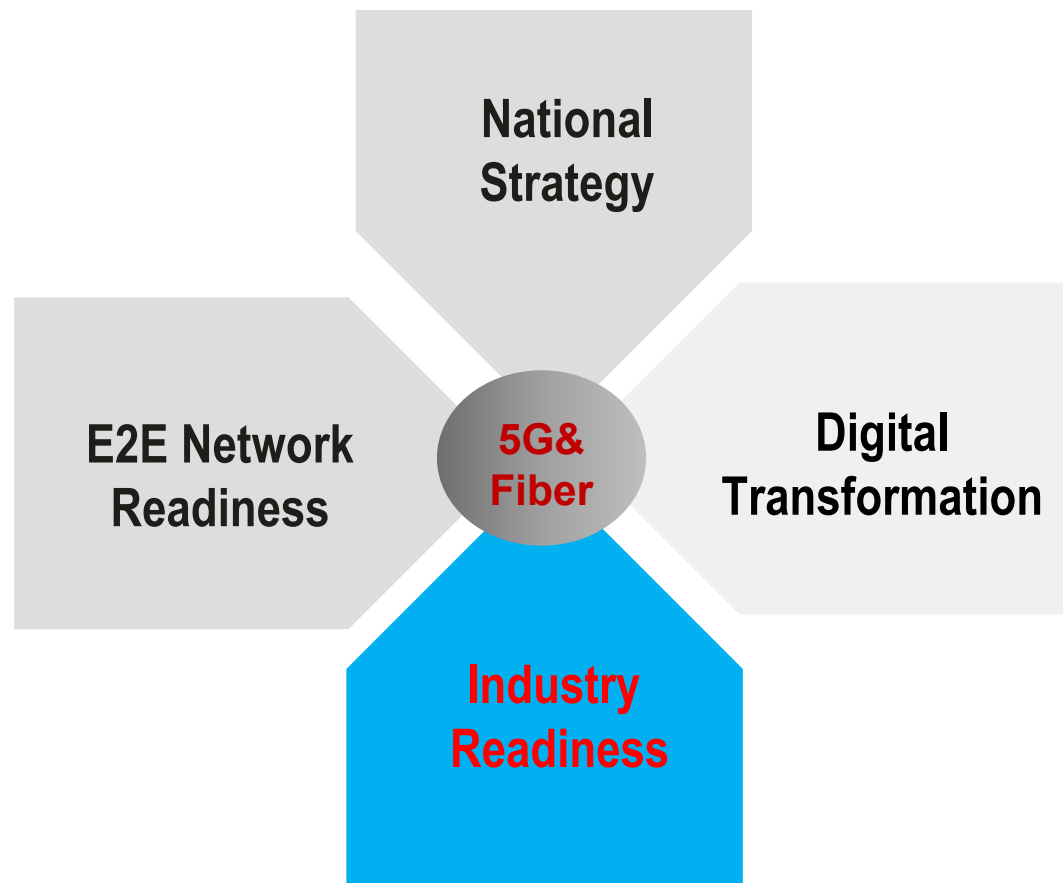
Developing infrastructures – E2E view



State contribution – Enabling the 5G era



Developing infrastructures – E2E view



Realize the 5G Market Space and Potential

5G Covers 58% of the Population, Video Traffic Share Reaches 89%, and Gbps-level Mobile Network Coverage Reaches 70%.



All things sensing



More sensing devices

Intelligent devices: **40 billion**

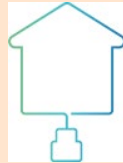


Sensing mode renovation

VR/AR users: **337 million**



All things connected



Faster connection

Gigabit broadband households: **30%**

Gigabit mobile network coverage: **70%**



More traffic

5G coverage

Population: **58%**

Video traffic share: **89%**



More connections

Global connections: **100 billion**

Mobile communications population: **80%**



Shared cloud

Cloud-based applications: **85%**

Computing load share of cloud datacenter: **90%**



Green connection

Carbon emission per connection: **-80%**

ICT-enabled energy saving & emission reduction: **+10x**



All things intelligent



Data value mining

Data produced annually: **+20x**

Enterprise data utilized: **86%**



More intelligent services

Smartphone users using intelligent assistants: **90%**

Household using intelligent robots: **14%**

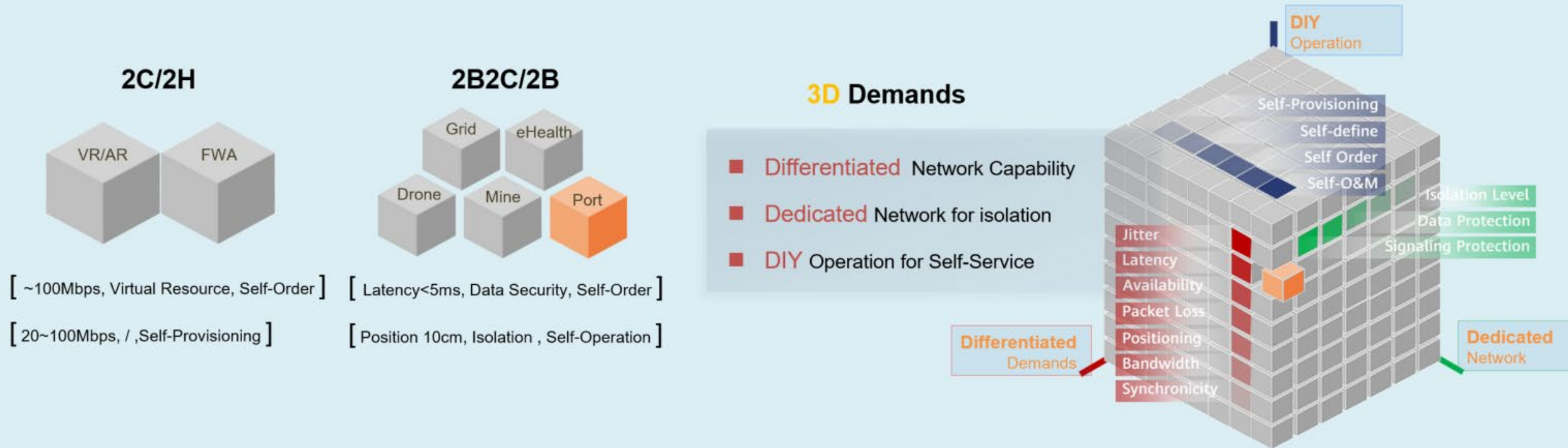
From 2C to 2B, 5G is Driving Industry Digital Transformation

Scenario		2C		2H	2B				
		Voice	Video	FWA	Healthcare	Smart Grid	Smart city	IoV	Drone
Requirements		<ul style="list-style-type: none"> VoLTE VoNR 	<ul style="list-style-type: none"> SD/HD 4K/8K VR/AR Interactive/ Panoramic live video 	<ul style="list-style-type: none"> WTTX (data +video) 	<ul style="list-style-type: none"> Remote diagnosis Remote surgery 	<ul style="list-style-type: none"> Feeder automation Intelligent power distribution 	<ul style="list-style-type: none"> Video surveillance parking, street lamps, and traffic lights etc 	<ul style="list-style-type: none"> Platooning Remote driving Automatic driving 	<ul style="list-style-type: none"> Professional inspection Media application logistics
	Bandwidth	<1M	>100M (instantaneous >1G)	>200M	>100M	>30M	>100M	>100M	>100M
	Latency	<100ms	<30ms	<50ms	<5ms deterministic delay	<10ms deterministic delay	<50ms	<10ms	<10ms deterministic delay
	Function	Better than 2G/3G voice quality	<ul style="list-style-type: none"> Edge rendering Codec compression 	<ul style="list-style-type: none"> Multicast to Unicast CDN collaboration 	<ul style="list-style-type: none"> Reliability >6*9 UP bandwidth scheduling 	<ul style="list-style-type: none"> Reliability >6*9 Precise control 	<ul style="list-style-type: none"> Massive connections 	<ul style="list-style-type: none"> Reliability >6*9 Platooning management 	<ul style="list-style-type: none"> Reliability >6*9 Platooning management
		Summary >10X bandwidth / user enhancement			<ul style="list-style-type: none"> High differentiation (bandwidth, delay, packet loss and jitter, mobility, and reliability) High security (multi-tenant isolation, data inside the campus) High automation (automatic service provisioning, independent network management, and intelligent O&M) 				
		eMBB enhanced requirement			Differentiated & deterministic experience is a must for 2B scenario				

Differentiated & Deterministic Network is Needed to Fulfill the Diverse 2B Requirements


Scenario extension

5G New Business Brings 3D Demands to the Network



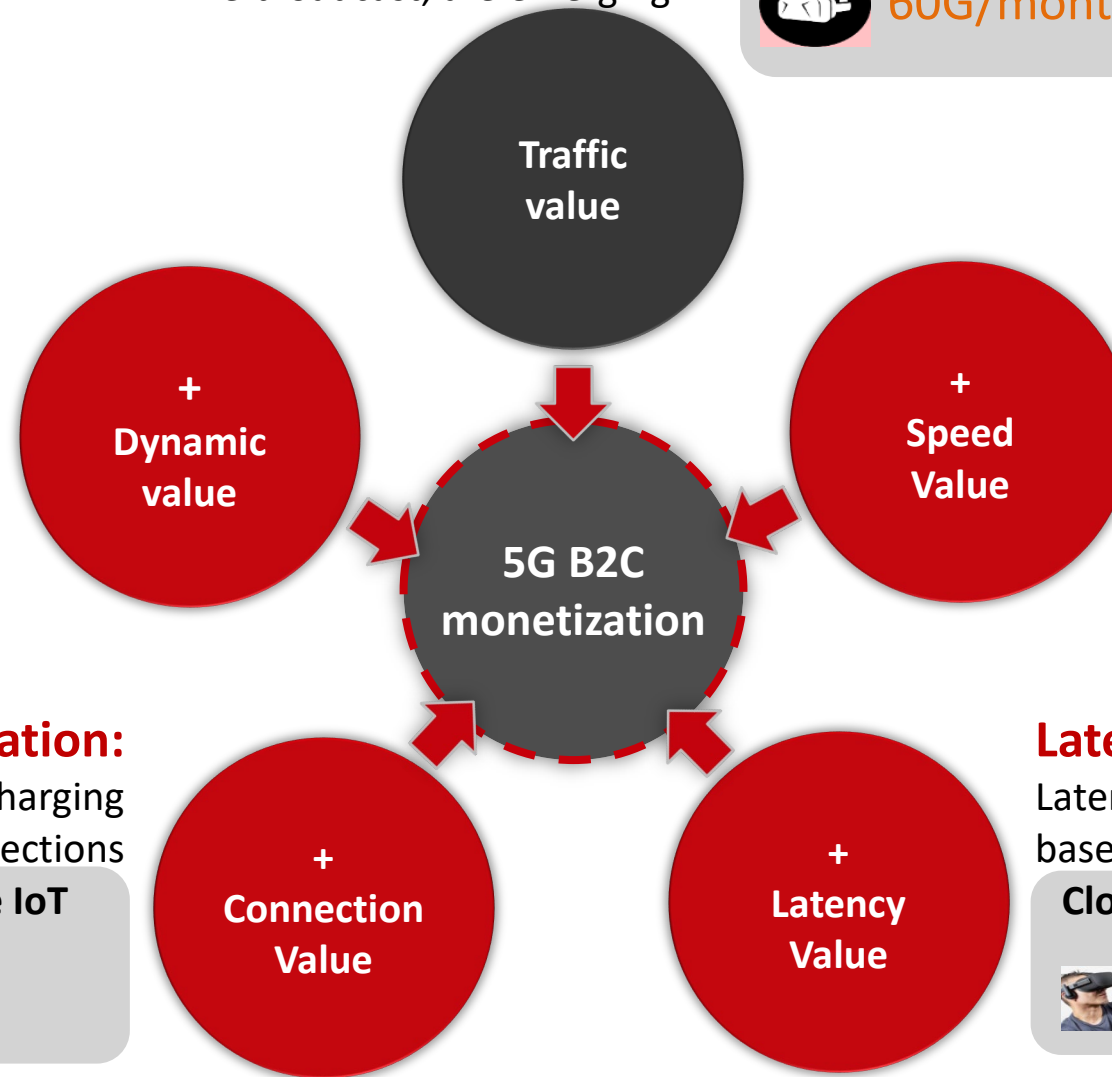
5G Unlocks new Possibilities of B2C Traffic Monetization

Traffic monetization:
Large traffic services, such as VR, HD UGC live broadcast, are emerging

VR entertainment streaming
 **60G/month**

Slicing:
Mature network slicing enables dynamic charging

VR live sports
 **90mins**
 **End user purchases game 'on-demand'**





Speed monetization:


- Uplink traffic monetization for UGC
- Charging based on downlink rate

Ensure better experience


- 360P: 380Kbps
- 480P: 2Mbps
- 720P: 5Mbps
- 2K/4K: 10Mbps/30Mbps

 爱奇艺
 搜狐视频
tv.sohu.com

Connection monetization:
Personal IoT connections enables charging based on number of connections

Wearables / home IoT / Vehicle IoT
 **10 conn./person**

Latency monetization:
Latency-sensitive services enables charging based on delay

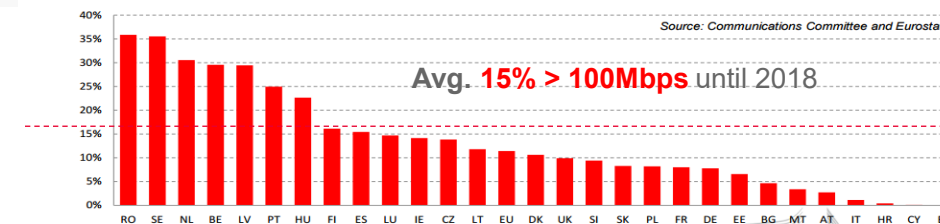
Cloud interactive gaming
 **~5ms**

FWA 5G Quick Win: Most of Operators Taking FWA as 1st 5G Use Case

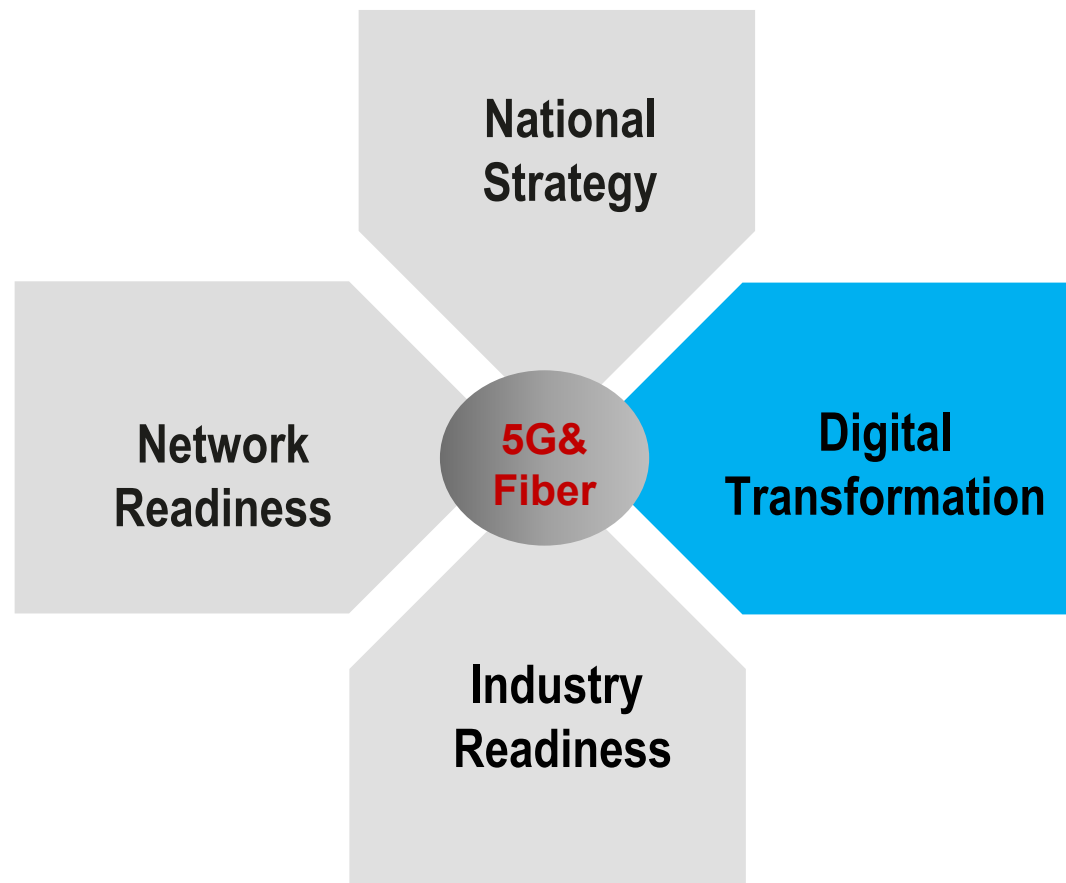
~80% First wave 5G Operators Plan to Choose FWA as First Use Case



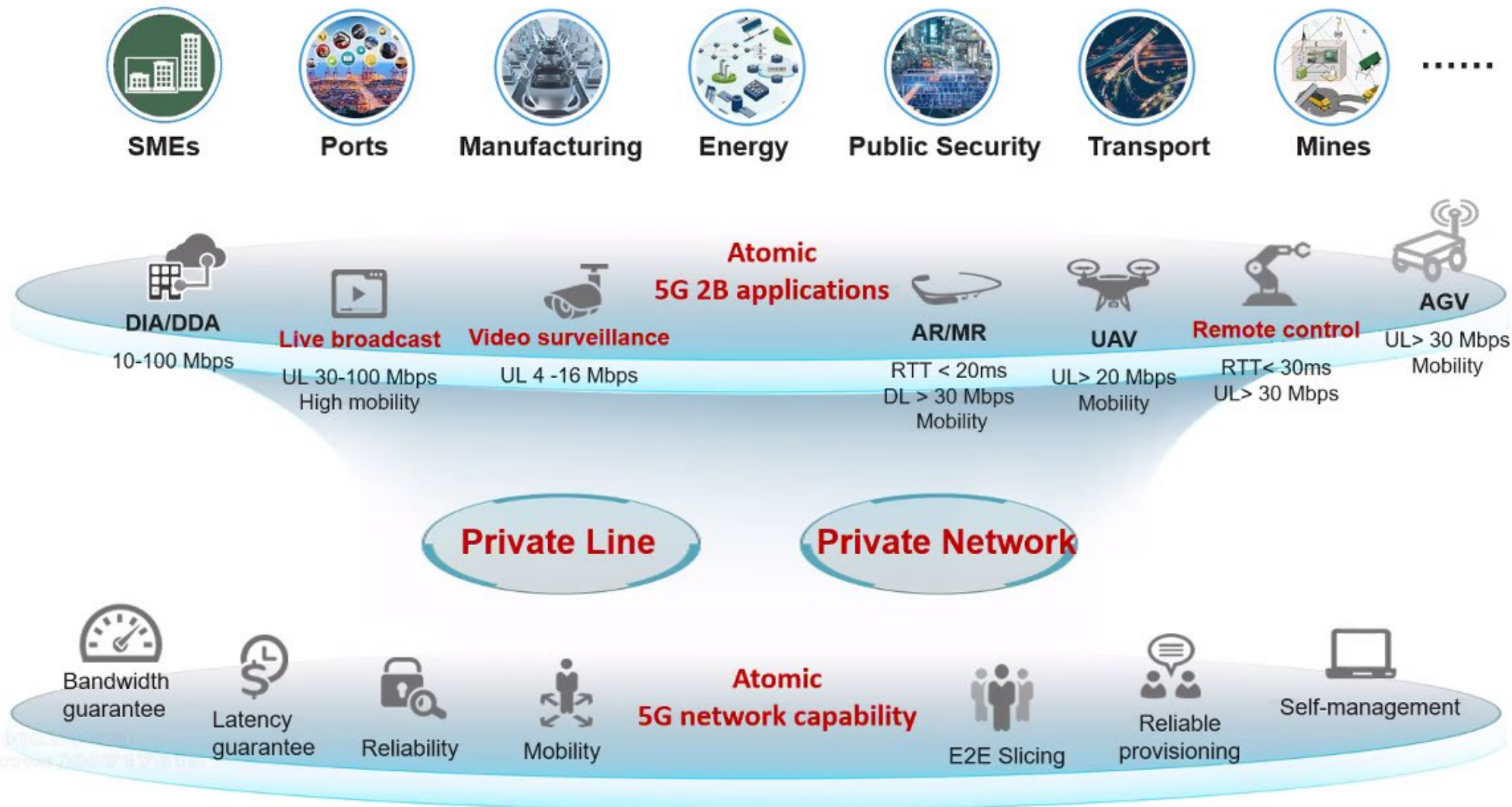
Target By 2025:
100% Household > 100Mbps



Developing infrastructures – E2E view



5G 2B Applications the Foundation of Digital Transformation



Digital Transformation along with 5G development



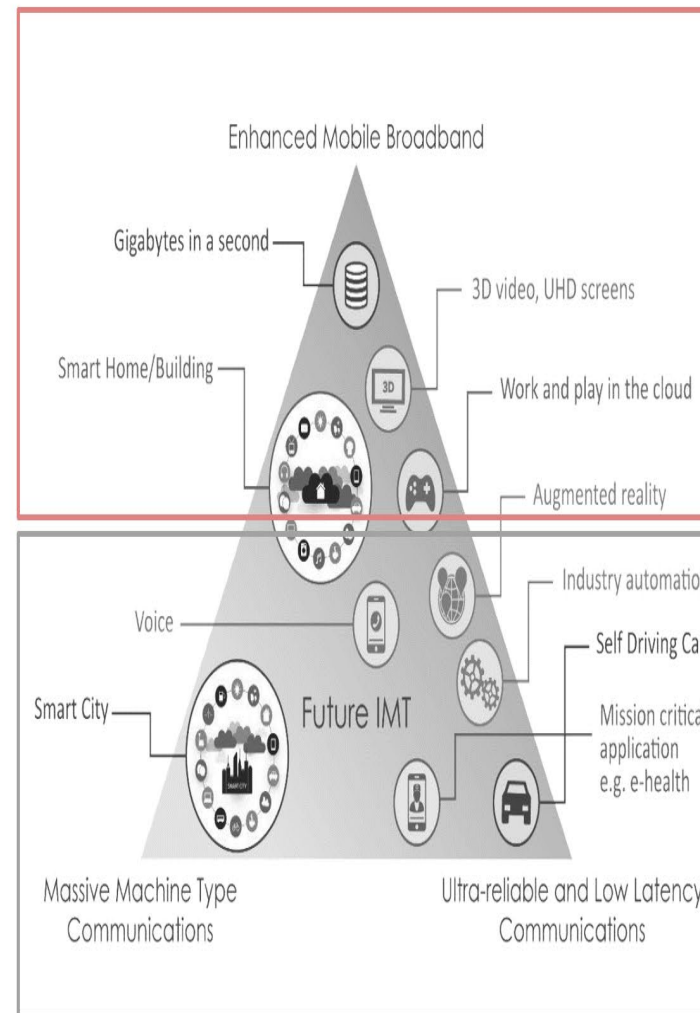
ICT skills development in all levels of educational pipelines

ICT infrastructure is considered as a key value component



Strong collaboration of the industry with Universities (Creation of local expertise HUBs per domain?)

Innovation should be the driver, 5G is the vehicle



1

Native for **Unlimited MBB**

100x capacity increase and 10x bit cost decrease to meet unlimited data tariff trend

2

Native for **Ultimate Experience**

10x speed increase brings 50-100Mbps @ anywhere/anytime

3

Native for **AR/VR**

10x latency decrease, enables <20m E2E latency

4

Native for **FMC**

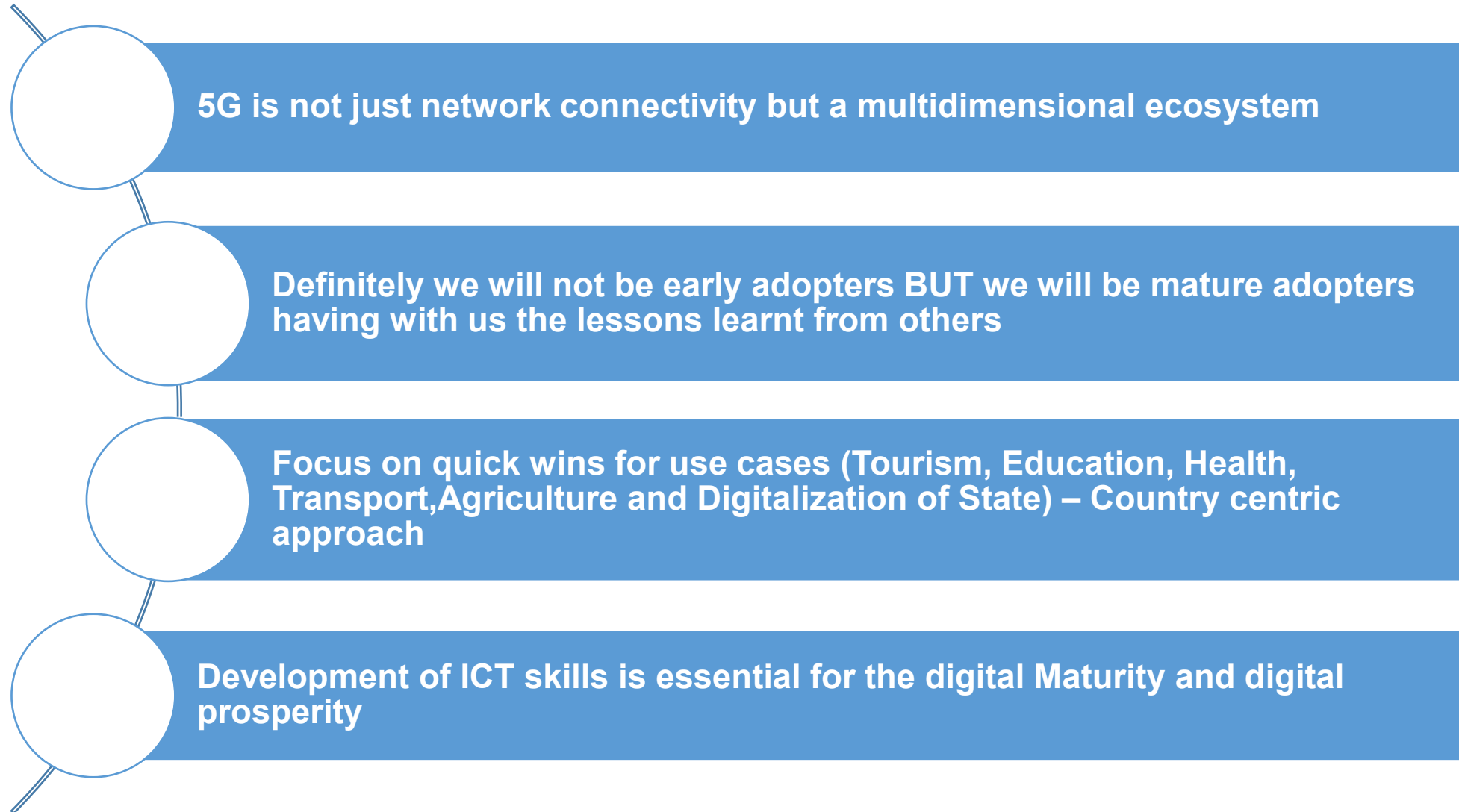
5G provides fiber like speed, one for FMC

5

Native for **IoT & AI**

5G IoT specifications will become more intelligent with AI in the future

Take Away



Thank you.

*Bring Digital to Every Person, Home and
Organization
for a Fully Connected, Intelligent World*

Bring digital to every person, home, and organization for a fully connected, intelligent world.

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