



Mobile IoT Summit at MWC21

IoT & Industry 4.0 in the 5G era Huawei's perspective

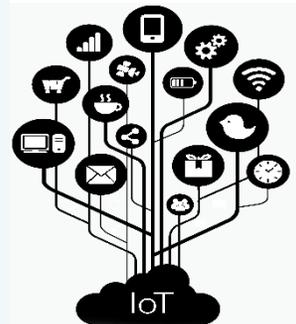
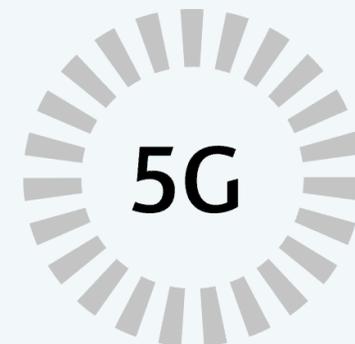
Keynote Stage, Hall 3, Fira Gran Via | Wednesday 30 June 2021

Platinum Sponsor



Koby Levy

Director of Digital Transformation & IoT



About me



Koby Levy

Director of IoT & Digital
Transformation, Huawei
Technologies Spain

Koby Levy

Leads Huawei's IoT and Smart city marketing and sales activities in Spain, promoting local partners eco-system and opening global markets for partners in delivering end-to-end Smart-XXX projects.

With strong technical and sales background for more than 25 years - now leading Digital transformation programs across Western Europe, the UK and CEE & Nordics - working across the carrier telecom market as well as public sector Enterprise and industry markets.



Huawei is passionate about intelligent communications & IoT
and is investing in innovations, and collaborations in the areas of :

5G 5.5G & 6G

Fixed & Mobile Convergence

IIOT, C-V2X, SmartXXX...

Native Cloud

Edge computing

AI

Devices, Cameras, Chipsets, CPEs and other hardware
and more...

Working with **Telecom Operators, Enterprise Clients, Consumers**, Industry and
Technology **Partners** globally

- Evolution
- Current affairs
- 5G Era
- A Decade Outlook

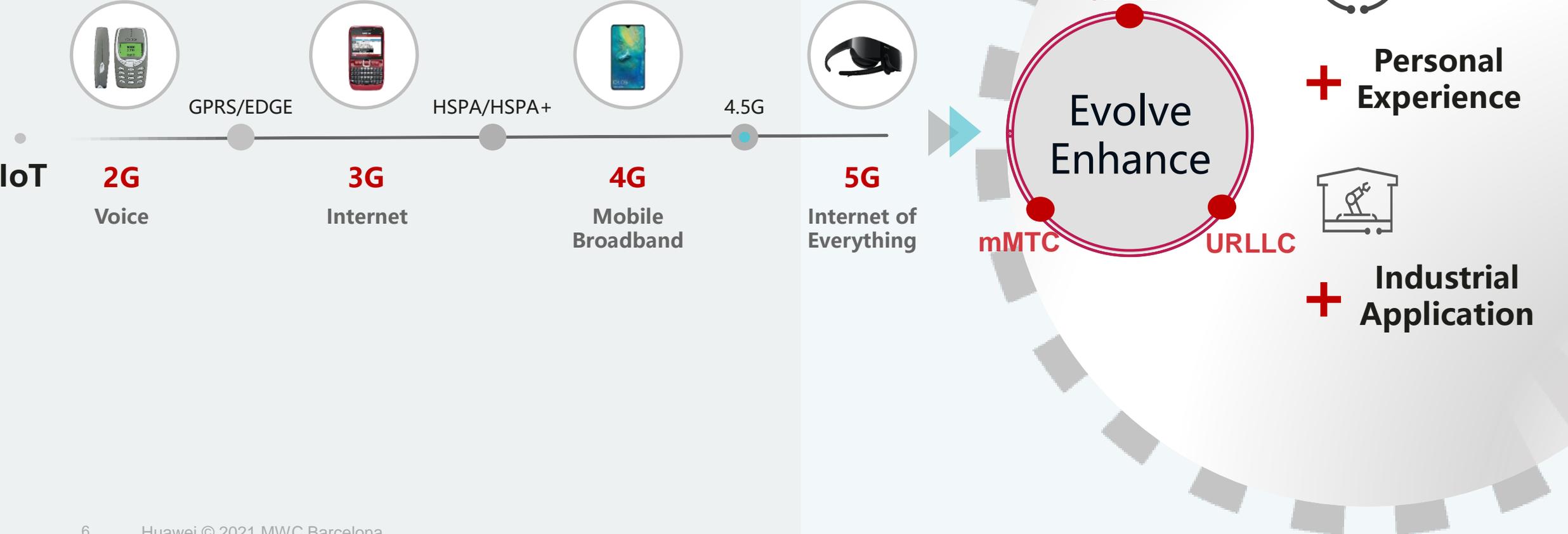


Evolution

1G
2G
3G
4G
5G
6G



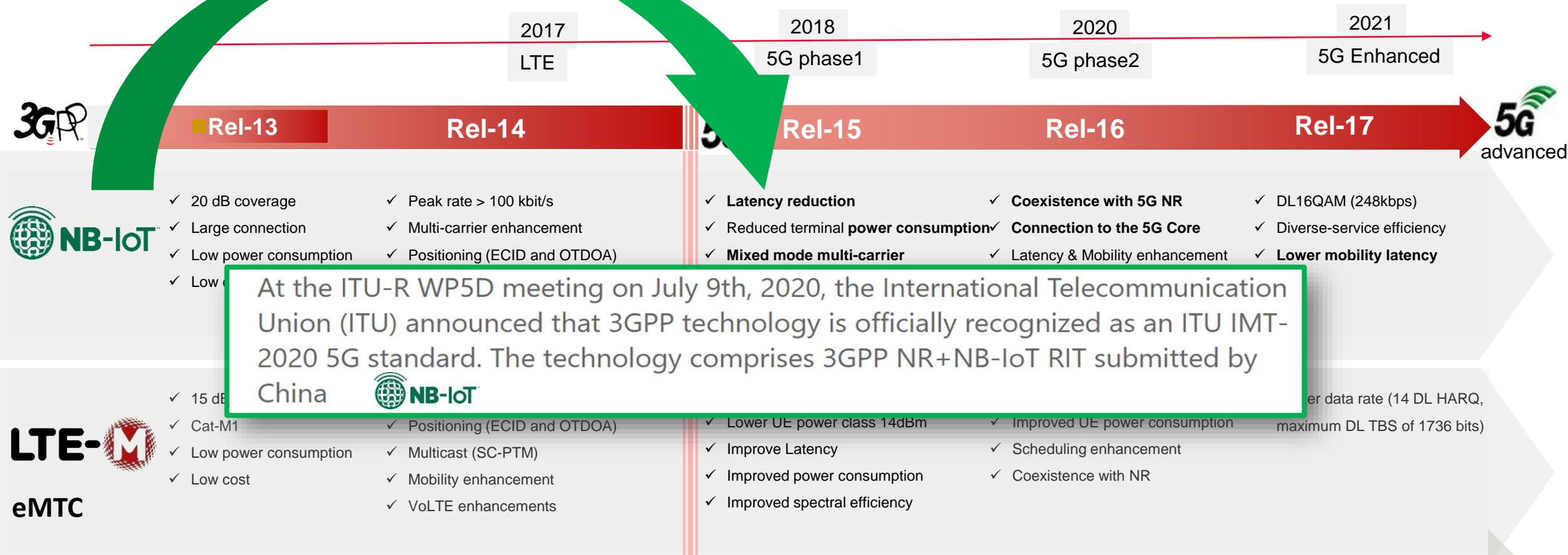
Evolution into 5G Era



Evolution of Mobile IoT LTE



Evolution of Mobile IoT From LTE to 5G



Huawei RAN underscores Mobile IoT Evolution into 5G



- CIoT 12.1(eRAN13.1)
- CIoT 13.1(eRAN13.1)
- CIoT 15.1(eRAN15.1)
- CIoT 16.1(eRAN16.1)
- CIoT 17.1(eRAN17.1)
- Future Releases



Selective global case studies



Electric meter

- > Sweden: 2~3mln
- > Saudi Arabia: 5mln+



Water meter

- > UK
- > Australia



Gas meter

- > Italy: 1mln



VF Global Supply Chain



VF UK Tree Monitoring



Thailand AIS Street Light



Thailand AIS NB-IoT Shared AC



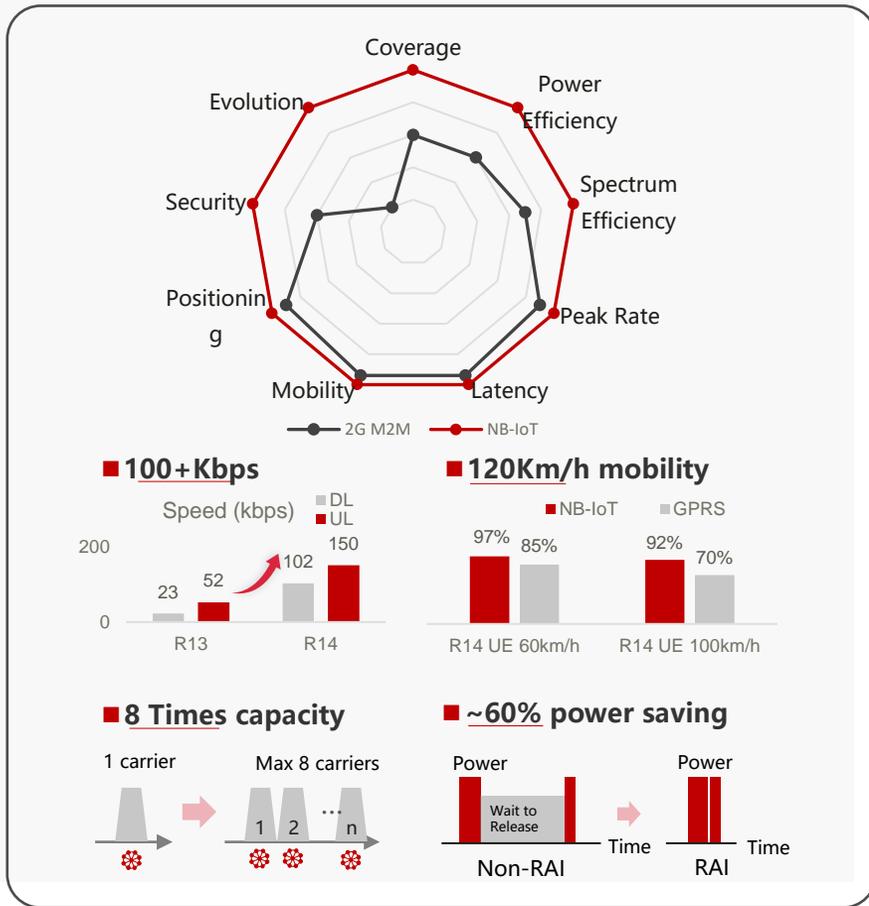
VF Hungary Smart Parking



Russia MTC Smart Trash Can

NB-IoT set to replace 2G M2M

NB-IoT R14 Exceeds 2G M2M



Upgrade to R14 and Above to Enable More Services

| | | | | | | | |
|-----------------|----------------------|--------------|----------------|-------------|------------------------|-----------------|------------|
| Smart Meter | Water | Gas | Electricity | Heat | Industrial | | |
| Public Safety | Smoke Detector | Fire Hydrant | Water Pressure | Water Gauge | Infrared Fire Detector | Inflammable Gas | Fire Alarm |
| Smart City | Parking | Street Light | Traffic Light | Garbage Bin | Manhole Cover | Postbox | POS |
| Sharing Economy | Bike | Scooter | AC | Laundry | | | |
| Anti-Covid | Infrared Thermometer | Door Sensor | | | | | |
| Tracking | Bike/Motorcycle | Cart | Vehicle | Cargo | Logistics | Cold Chain | |
| Wearable | Elderly Care | Child Care | ID Card | Pet Tracker | Connected Cow | | |
| Monitoring | Land Slide | Air Quality | | | | | |

Summary of Evolution

- NB-IoT and eMTC baseline **5G mMTC**
- NB-IoT can connect up to **1 million devices per square kilometer**
- NB-IoT, now officially a member of the 5G family, will have a life cycle just like other 5G technologies and serve **5G massive IoT access** in the coming decades
- For mobile network operators (MNO), investments in NB-IoT networks constitute a proportion of investment in 5G for future long-term operations, which **protect the ROI**
- **long-term roadmaps** can be planned for products, systems, and solutions
- As 2G phases out, M2M and IoT users face risks of discontinuation. NB-IoT networks, **guarantee operation life cycle** of over 10 years, ensuring long-term connectivity of IoT terminals.
- From Release 16, NB-IoT can coexist with 5G NR, and NB-IoT new terminals can access the 5G core network.
- NB-IoT further improves the energy and spectral efficiencies and **enhances interoperability**.

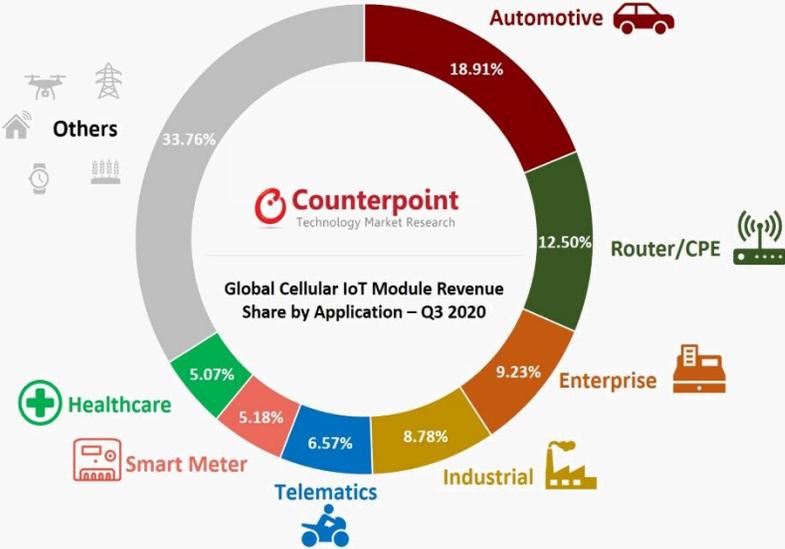


Current affairs

Mobile IoT current affairs

Follow the Money

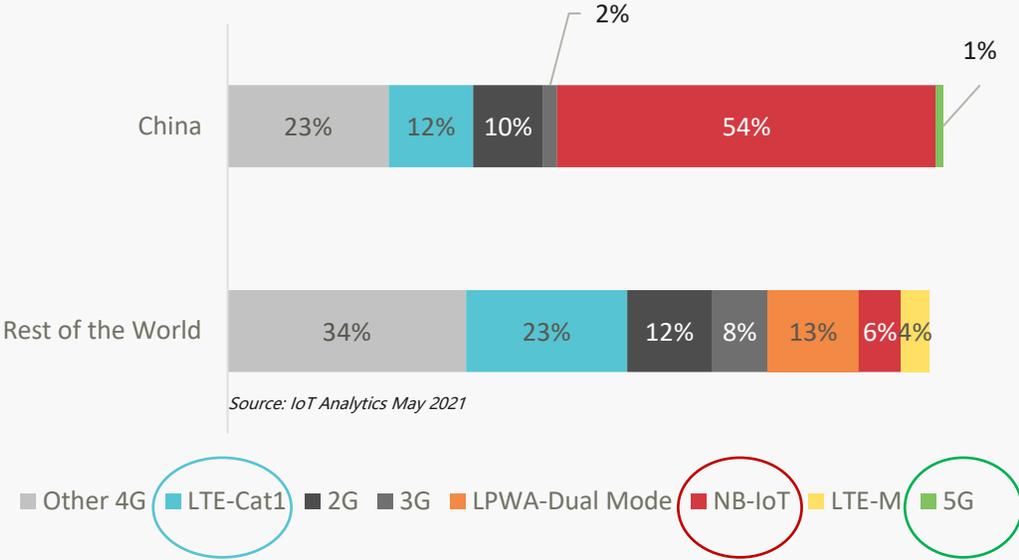
Global cellular IoT module Revenue



Source: Global Cellular IoT Module by Brand by Tech by Application Tracker, Q3 2020

Follow the Shipments

2020 Module Shipment by Tech Share %



Source: IoT Analytics May 2021

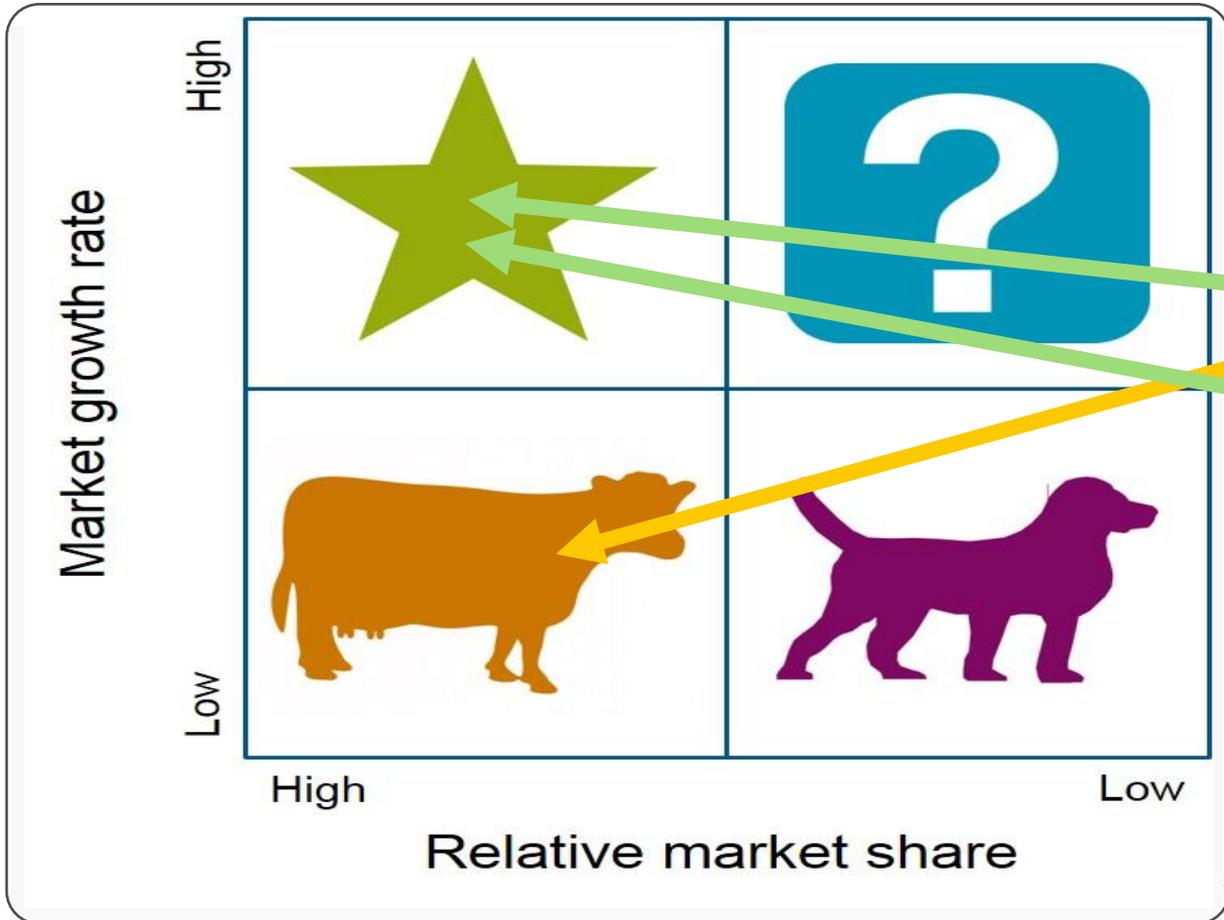
- Global cellular IoT module **shipments increased by 50% YoY** and 11% QoQ during Q1 2021

- NB-IoT Module Share in Cellular **IoT Module Shipments at Record 30%** in Q3 2020

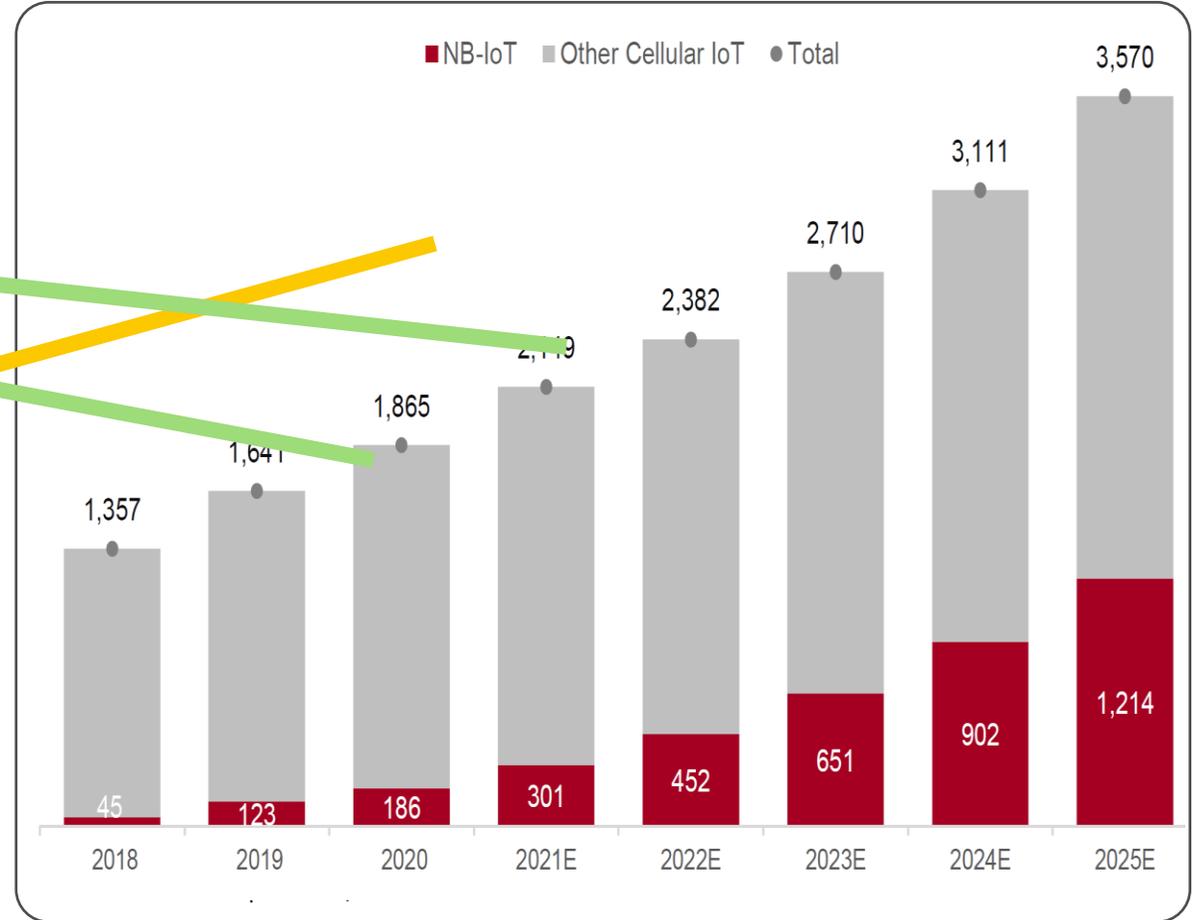
Source: Counterpoint Q1/2021

Focus on NB-IoT

China



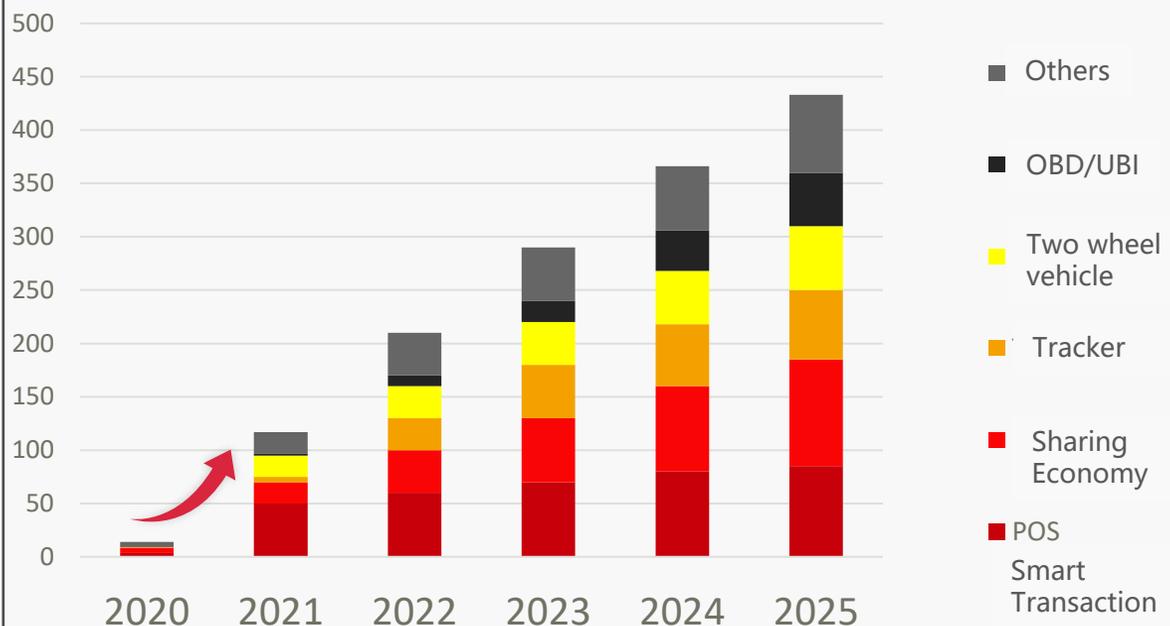
Global



LTE-Cat1 is Growing at a Fast Pace

Strong Growth Seen & Anticipated

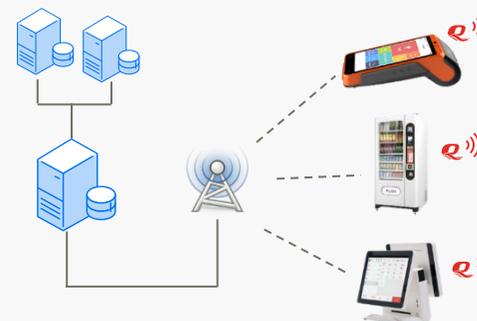
Cat 1 Global Connection (M pcs)



Source: Quectel 2021

Signature Cases

Smart Payment



Third Party Payment Platform



- 2G/3G->LTE Cat1
- \$30B Vending Machine @ 2024
- \$80B POS@ 2026

Sharing Economy



Scooter



E-Bikes



Charger



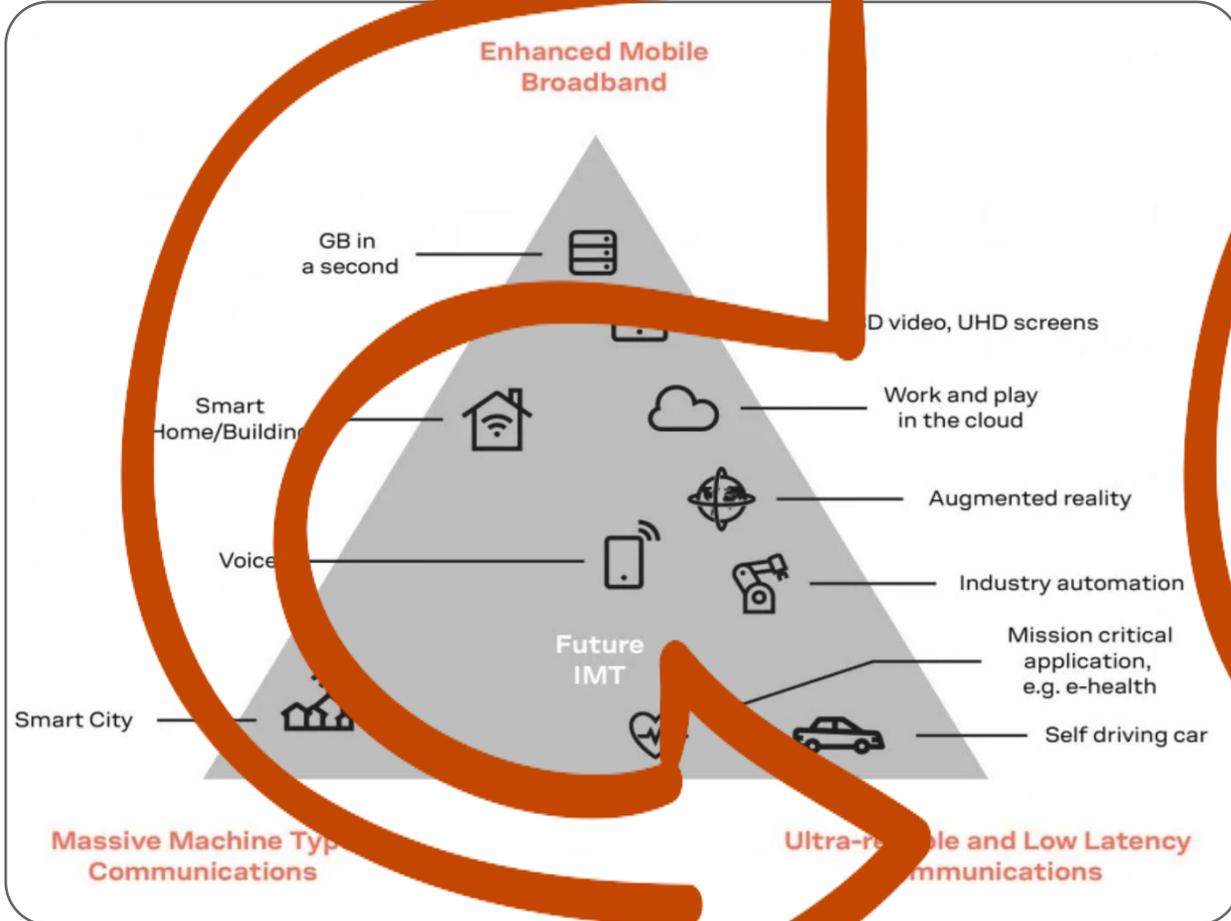
A hand is shown holding a glowing, spherical orb. The background is a dark, futuristic space filled with streams of binary code (0s and 1s) and glowing lines, suggesting a digital or data environment. The text "5G Era" is prominently displayed in the center of the image.

5G Era

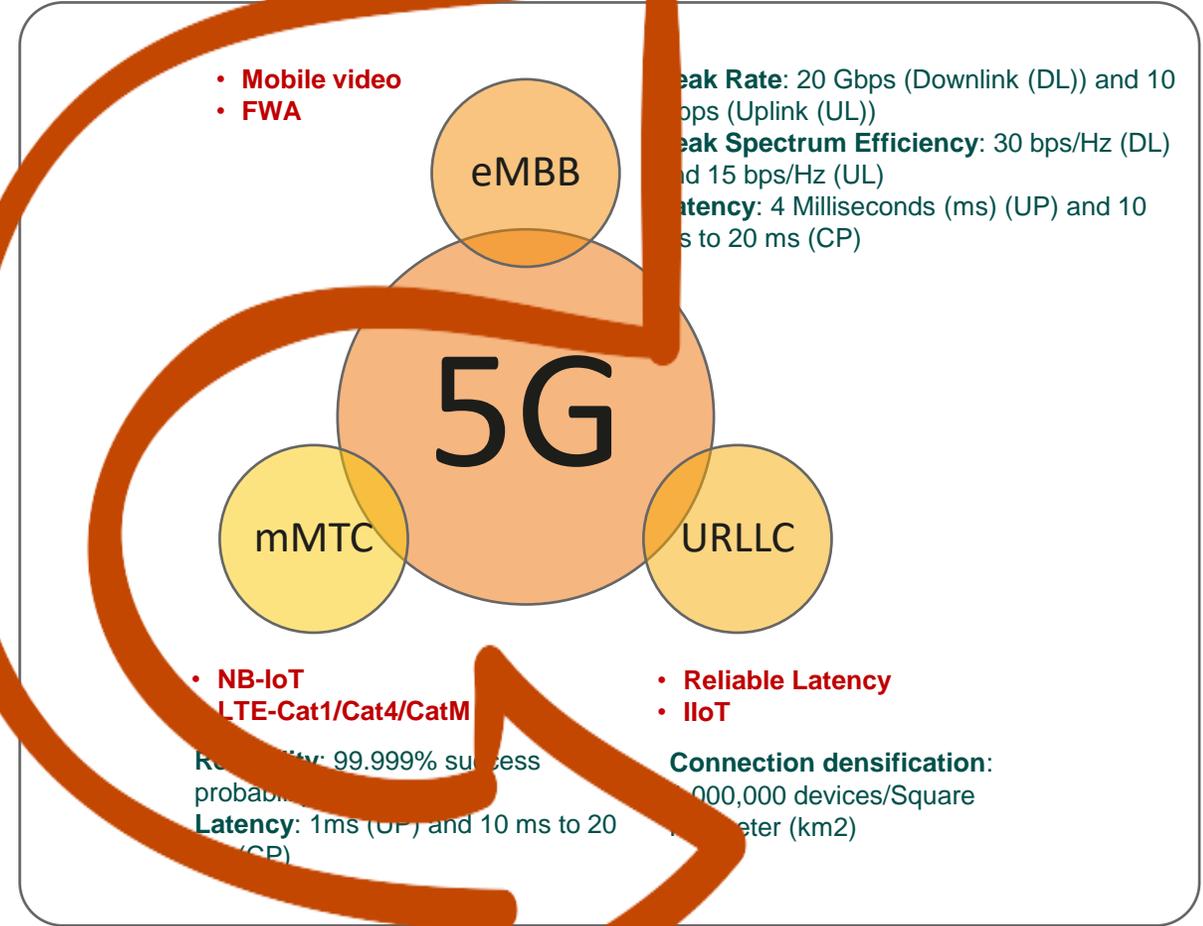
Current State: Early 5G Era

The 5G era shifts priorities to Industry 4.0

Use Cases



Technology



Industry adoption of 5G makes Solid Progress

5G is Growing at An Unprecedented Fast Pace

| | 2019 | 2021.4 | |
|---|-----------|-------------|---------------|
|  Network | 8 | 162 | 20x |
|  Terminal | 33 | 700+ | 21x |
|  User | 1 million | 350 million | 350x ↑ |

toB is Booming: Mature Ecosystem & Applications

50+

CPE, Routers,
Gateways

90+

Industrial
Modules

<\$100

Price of Entry Level
module



TD TECH
5G CPE Ins 2.0



Microview
Industry Camera



HIK
Industry Robot

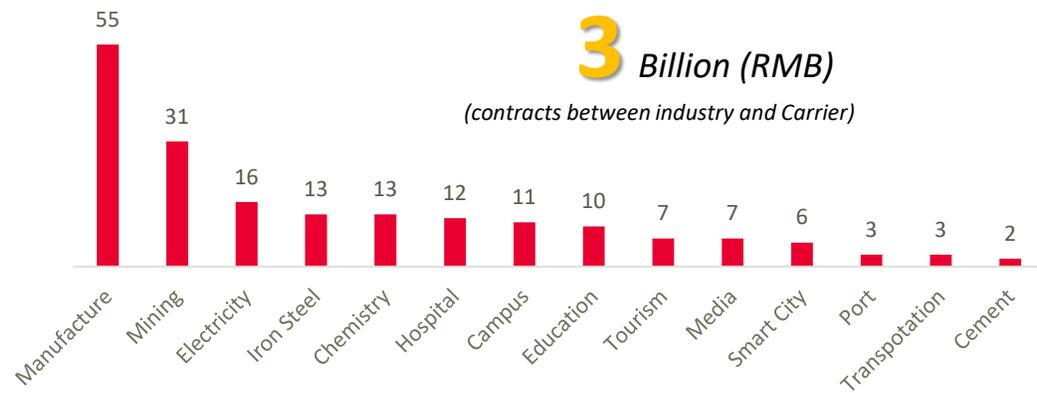


Cogent
Backpack



TVU One
Backpack

China is Exploring Vertical Industry @ 5G



5G Telemedicine



5G Smart Port



5G Smart Farm



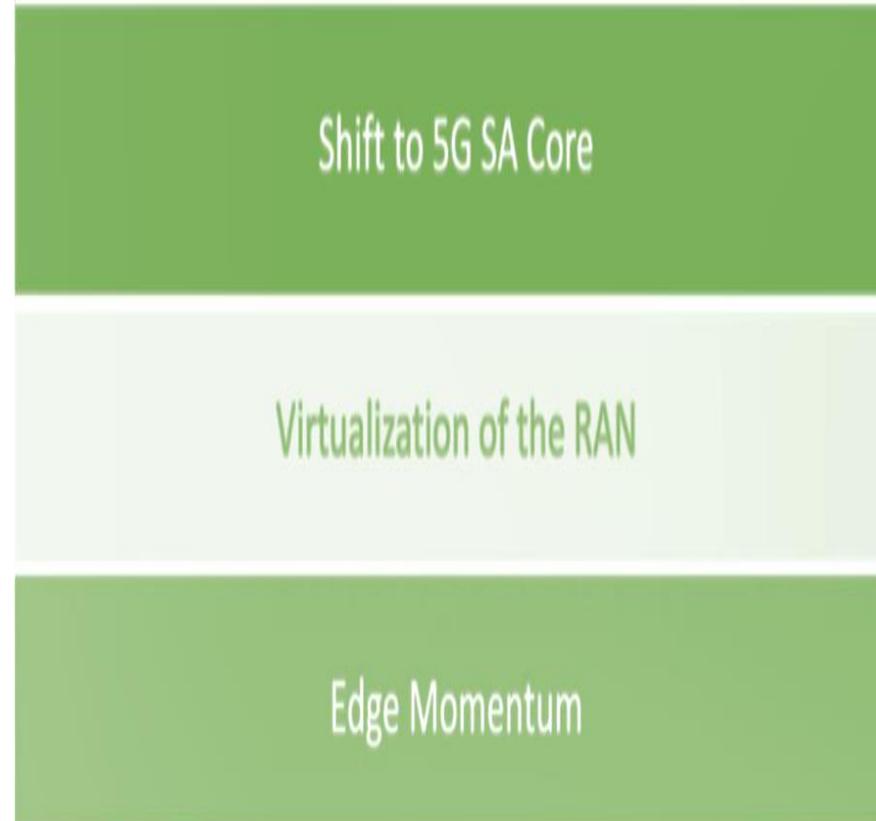
5G Smart Mine



5G Smart Steelmaking

Current 5G Momentum

- ① **Shift from NSA to SA core:** Most carriers start to deploy SA in 2021; by 2024, 80% carriers will implement core network virtualization.
- ② **Cloudification at the core :** technology is the basis.
- ③ **Edge momentum:** edge cloud in a multi-cloud environment

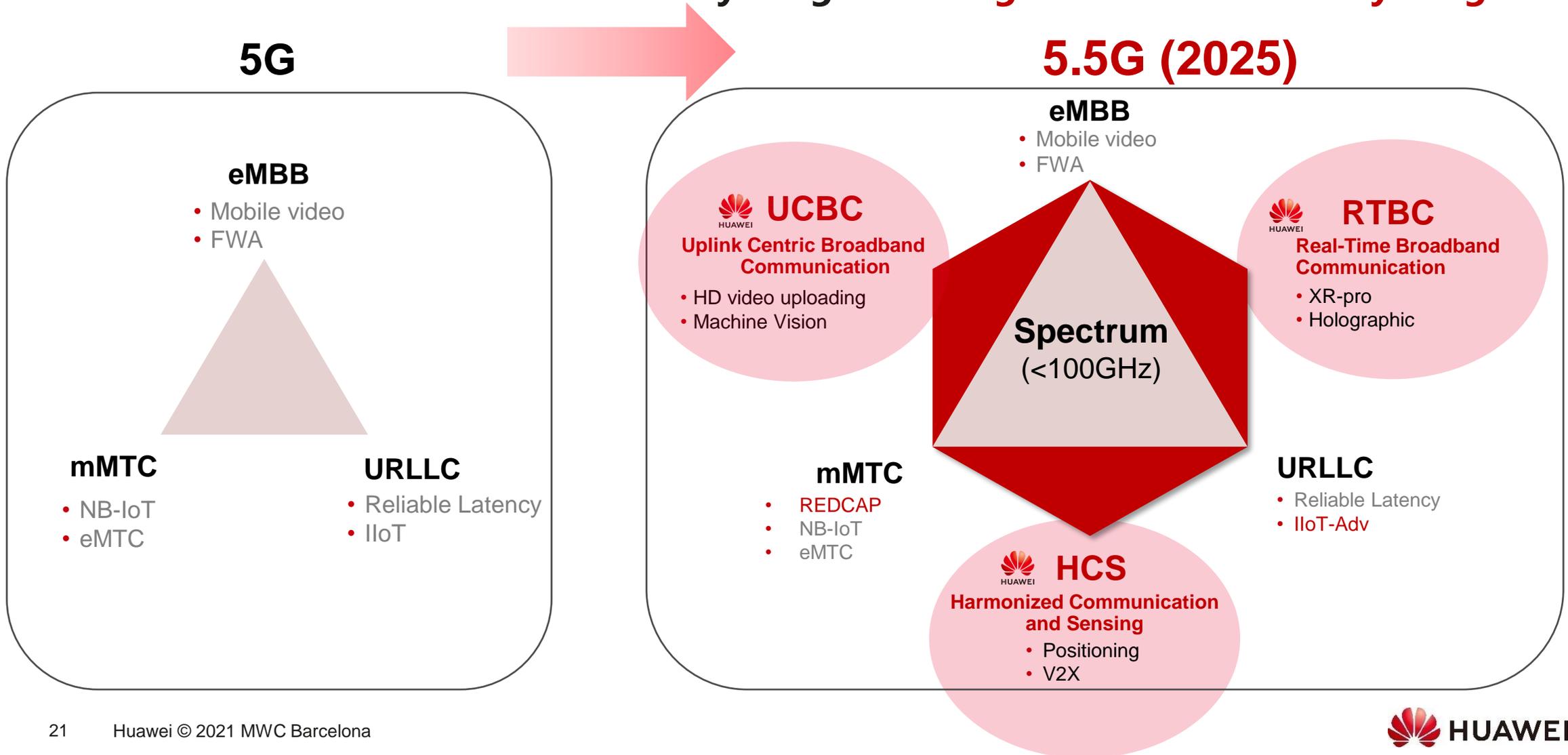


A grayscale photograph of a person in a suit holding a crystal ball. The person's hands are positioned around the crystal ball, which is held in front of their chest. The background is a soft-focus landscape. The overall tone is professional and contemplative.

A Decade Outlook

Huawei vision for 5G expansion

5.5G : from the **Internet of Everything** to **Intelligent Internet of Everything**



Outlook on the decade (2020–2030)

IMT Spectrum 2020-2030



- 5G launches well underway (licensing & roll outs)
- Planning underway in some countries on expansion spectrum in 2023/5-2030 timeframe
- 6G early discussions commencing targeting 2030+ timeframe

SUMMARY

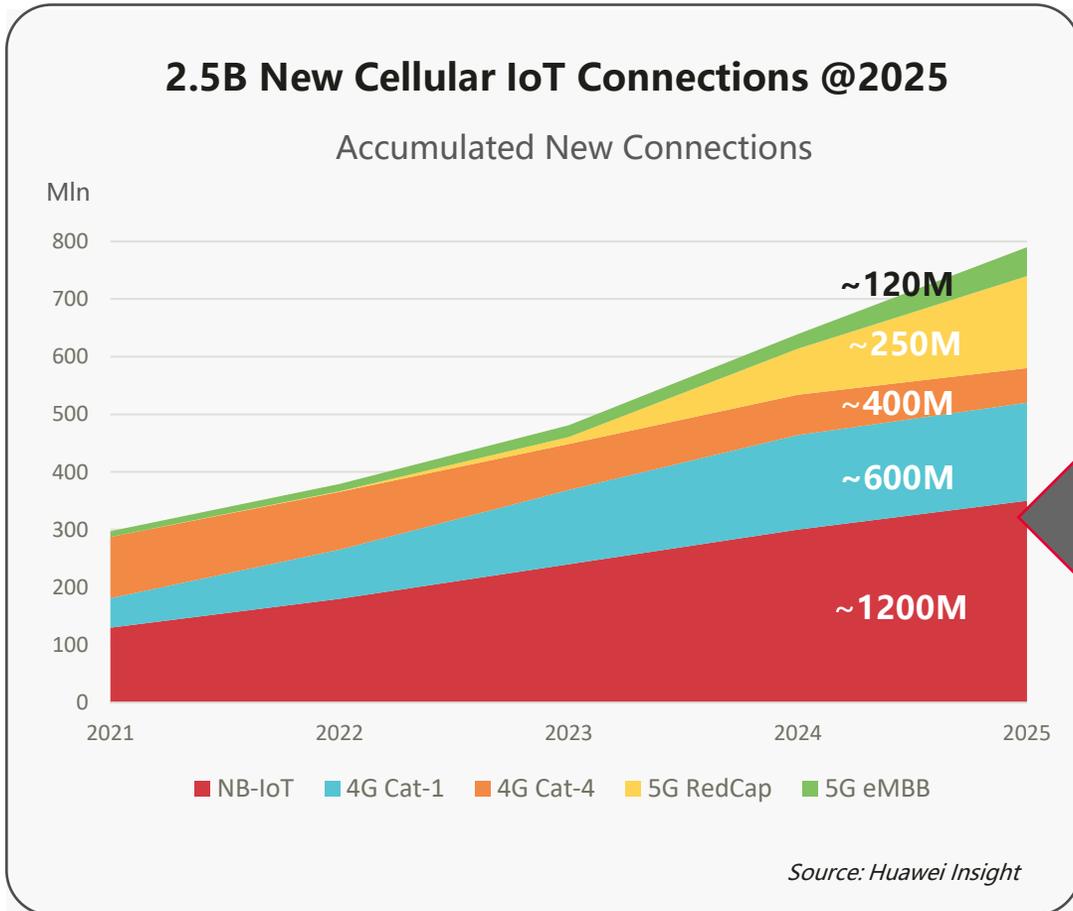


Mobile IoT Technology Adoption prediction

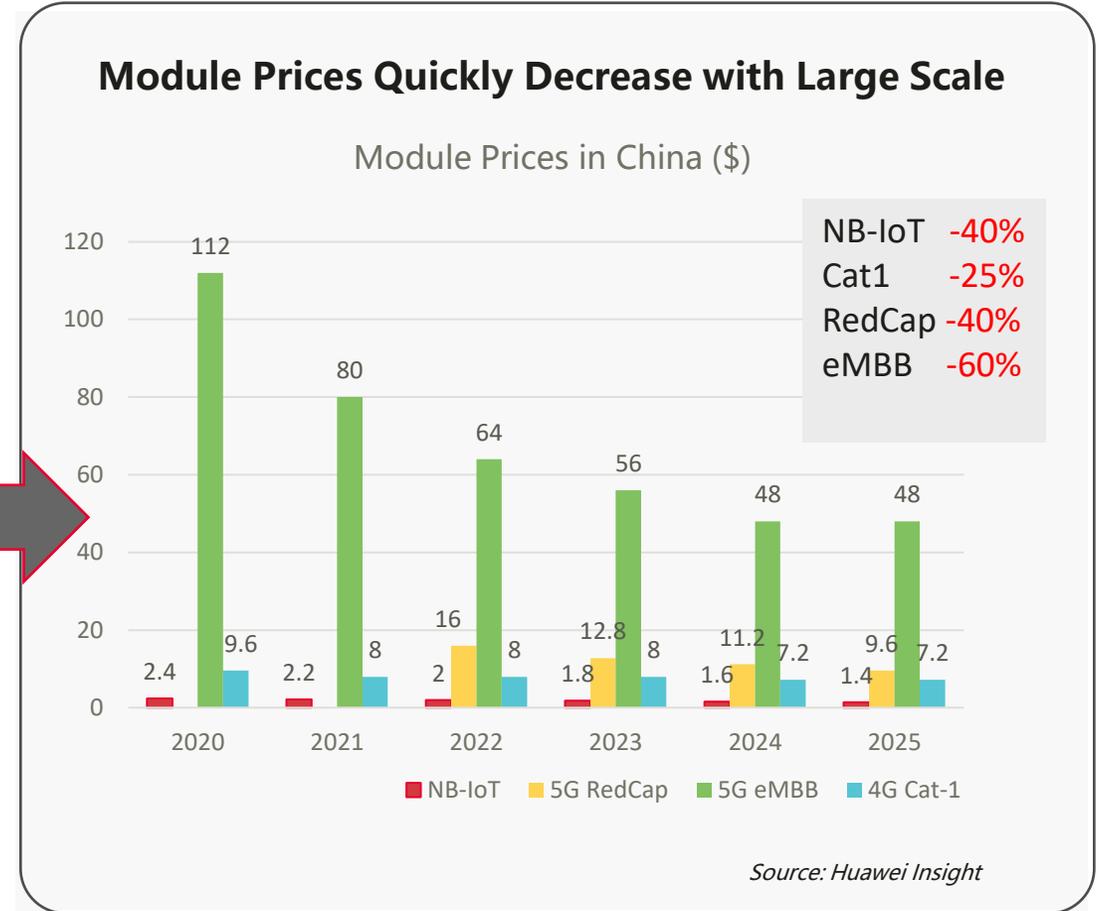
| Speed | Cases | Benefits |
|--------|--|---|
| High | Telemedicine Industrial Connected cars 5GtoB... | ✓ High speed ✓ Low latency ✓ High reliability |
| Medium | E-scooters/bikes POS machine Tracker Vehicle devices... | ✓ Strong capability (5~10x speed vs LTE-M) ✓ Competitive price (~LTE-M) ✓ Network coverage (>LTE-M) |
| Low | Smart metering Smart city Agriculture Logistics Tracker Sensor... | ✓ Low power (>10yrs metering) ✓ Low price (2\$ module in China) ✓ Global coverage (106 networks) ✓ Mass connections (~200M@2021) |

Consumer IoT - Five Years Prediction by Huawei

Volumes

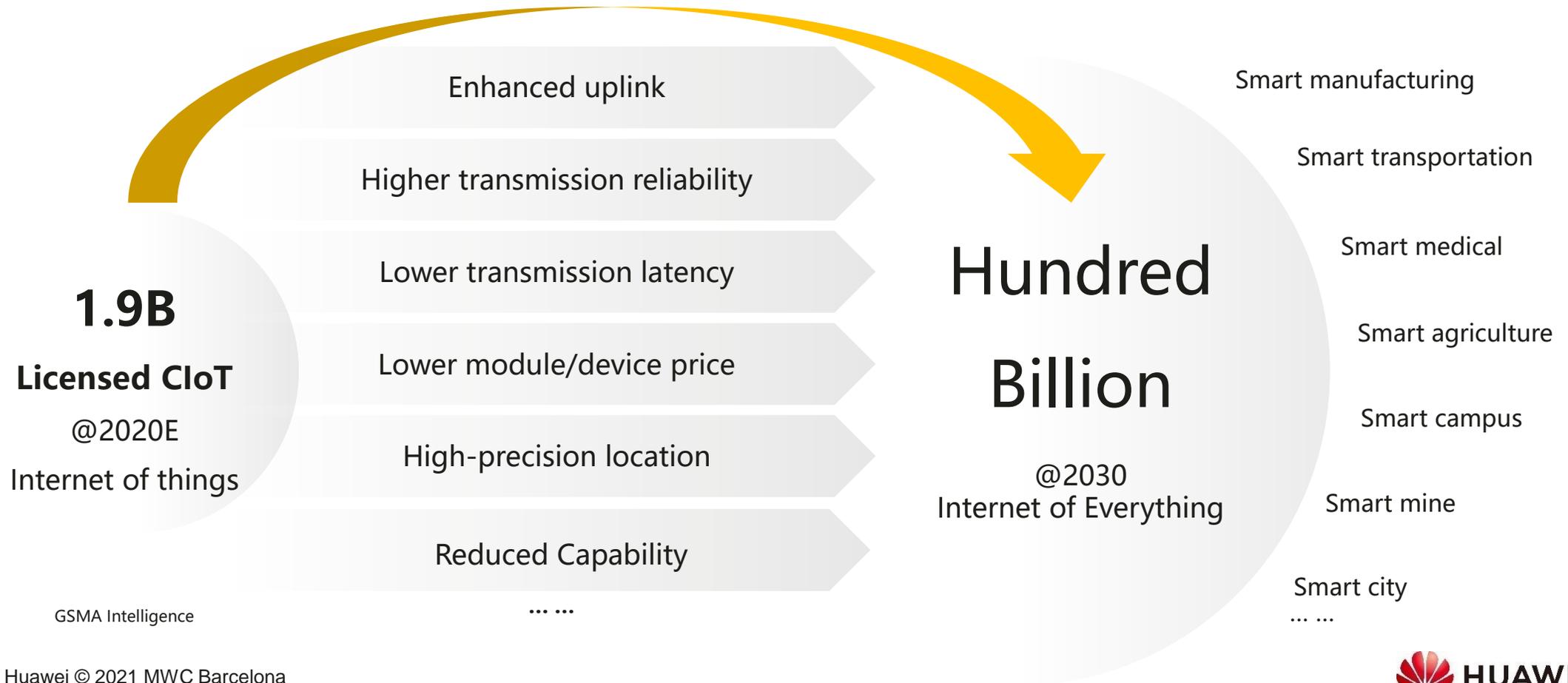


Prices



Summary:

the 5G Era is here , a decade of massive IoT driven by innovation and Viable business cases, with growing focus on Smart Industry 4.0
100 Billion IoT Connections by 2030



Thank you.

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**Passionate about Intelligent Communications
and IoT**

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

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