



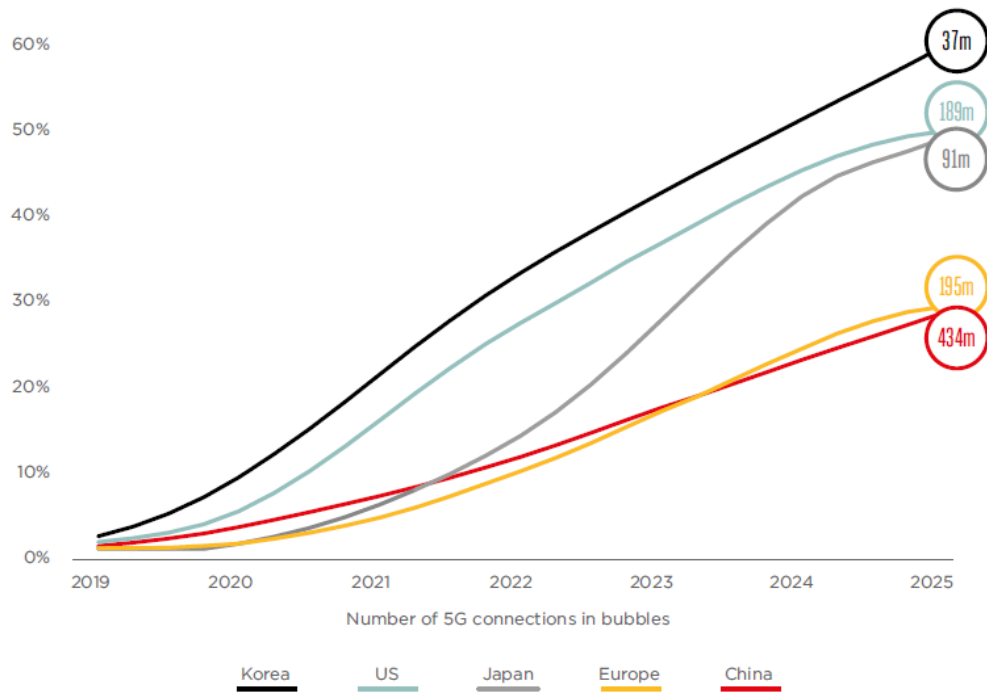
The 5G enterprise story

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Recapping...5G will take time with consumers

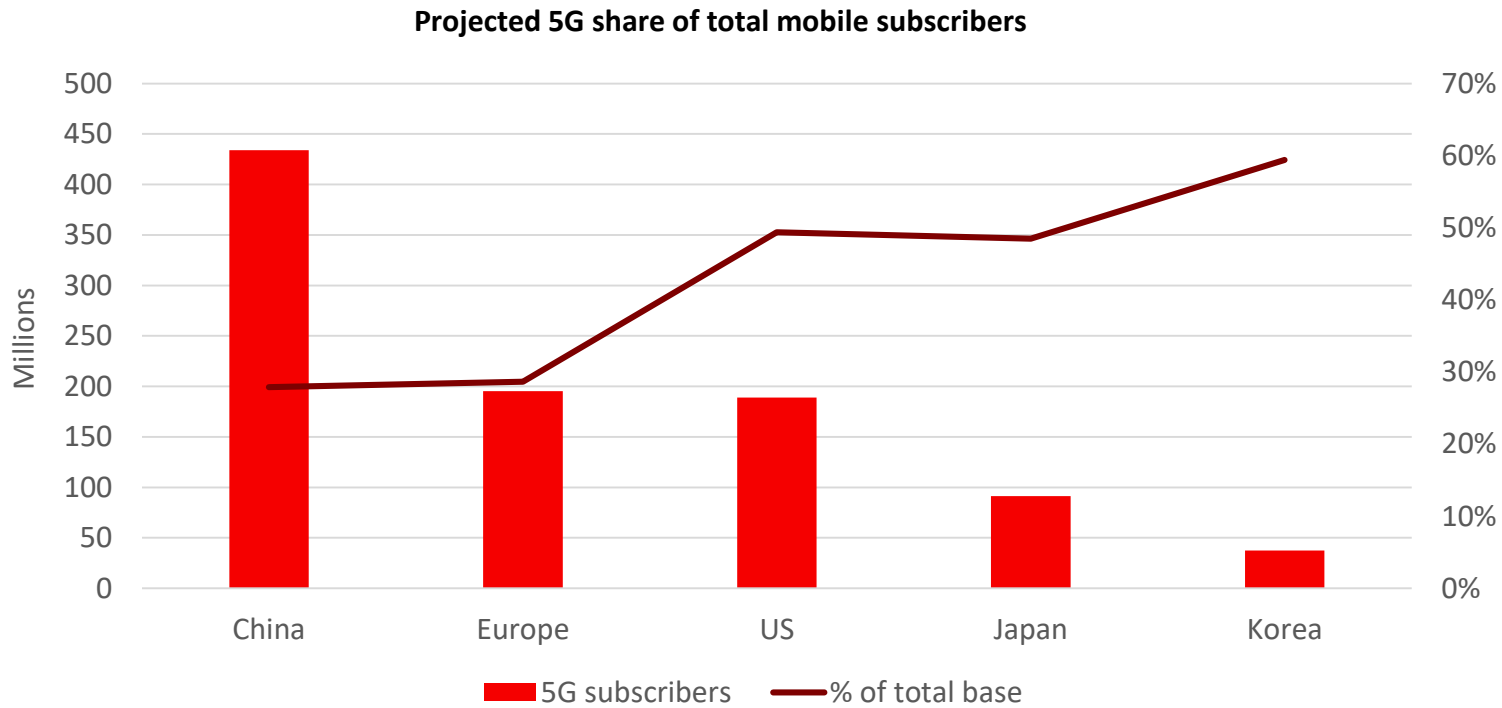
Projected 5G share of total mobile subscribers



Source: GSMA Intelligence



China will be the global #1, although J/K more penetrated

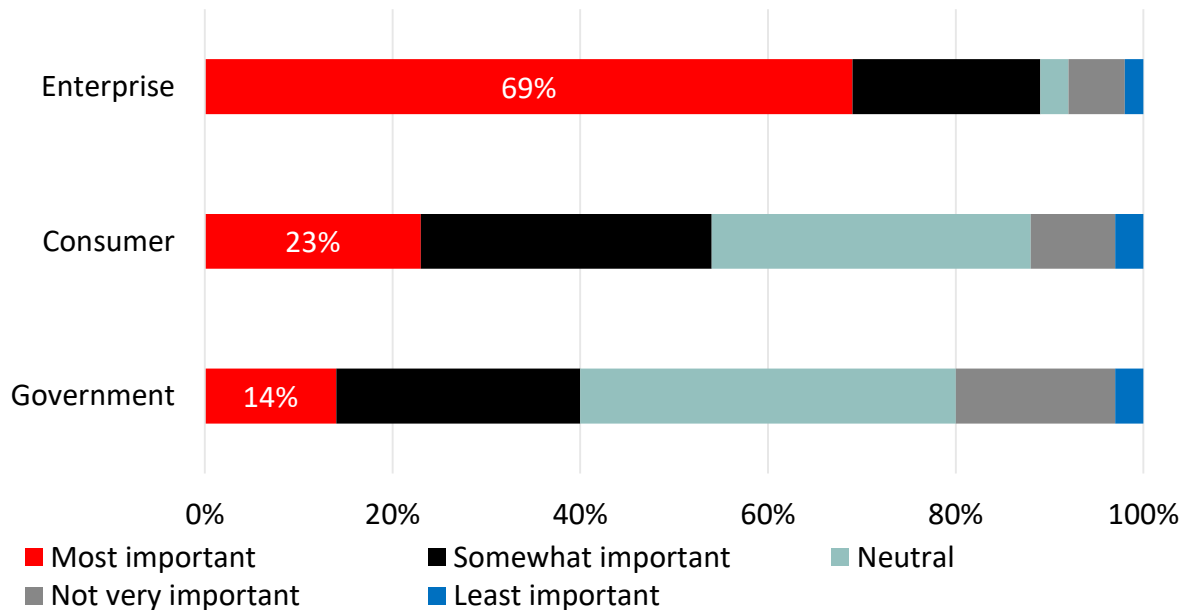


Source: GSMA Intelligence



Enterprise seen by management as the incremental 5G revenue opportunity

Incremental revenue potential from 5G? Survey of MNOs...



Deep dive on 5G in vertical sectors

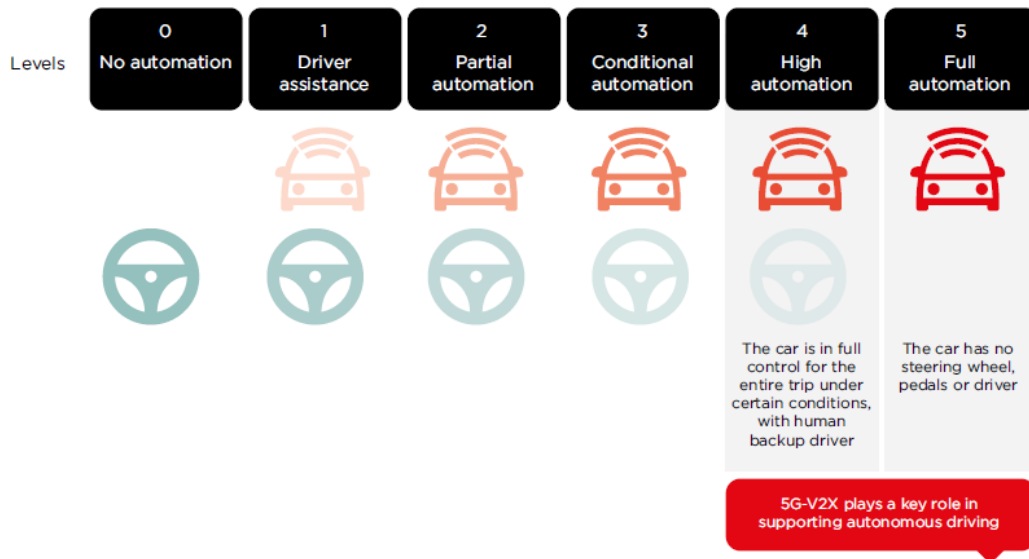
- Automotive
- Drones
- Manufacturing

Source: GSMA Intelligence – The 5G era: Age of boundless connectivity and intelligent automation (February 2017)
Based on global survey of operator CEOs (N=281; 1/3 US, 1/3 Asia, 1/3 rest of world)



Automotive: build on V2X trials, early partnerships key

- Case for 5G centres on low latencies demanded by autonomous control systems (stage 4 and 5)
- Trials underway with cellular V2X...
- ...but also with host of internet majors (Tencent, Baidu, Google)
- Platform model higher value for operators than straight connectivity...but needs partnerships...early

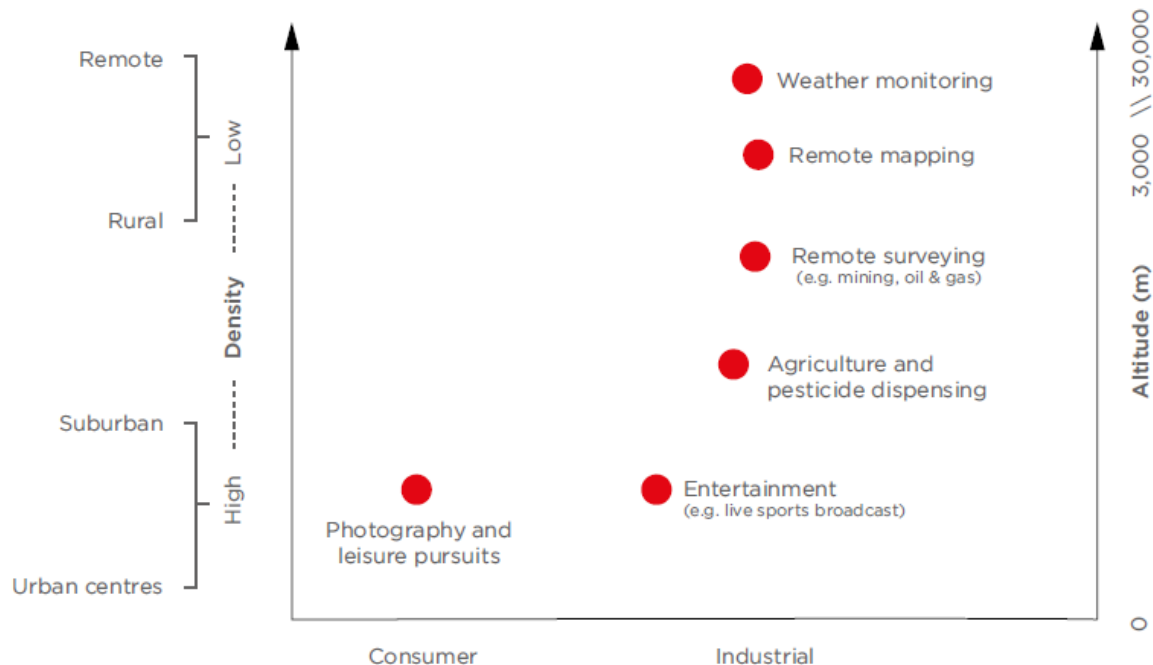


Source: GSMA Intelligence



Drones (UAVs): still open to shape direction of travel

- Industrial use cases fast evolving
- Hybrid model
 - LTE – connectivity (flight guidance, video transmission)
 - 5G – real time analytics
- Challenges
 - Revenue model
 - Common standards



Source: GSMA Intelligence



Manufacturing and Industry 4.0: watch out for AWS, MSFT, GE and co

- High volume play – especially in China and other manufacturing intensive economies
- 5G (again) built on the latency demand from robotics
- Industrial transformation will be 10-20 year process but...
- Window is short for supplier agreements and competition high with cloud majors

ROBOTS AND ROBOTICS

- 5G will increasingly replace Wi-Fi-based connectivity in factories
- Real-time robot collaboration and integration throughout the production line
- Cloud-based wireless robotics

REMOTE REAL-TIME OR NEAR-REAL-TIME MANUFACTURING

- Live remote monitoring and reconfiguration of robots and processes
- Remote quality inspection

LABOUR AUGMENTATION

- 5G coupled with industrial AR enables workforce training and augments human skills
- High precision simulations of human-machine interaction in various manufacturing situations

CONNECTED OPERATIONAL INTELLIGENCE AND ANALYTICS

- 5G coupled with AI enables real-time data gathering to inform immediate manufacturing decisions
- 5G based, large-scale data analytics in various areas (i.e. processes, inefficiencies, predictive maintenance for robots)

Source: GSMA Intelligence



Public Policy implications in China

General

- Spectrum harmonisation
 - Speeds deployment
 - Scale economies
- Cross sector regulation
 - Joined up regulations for 5G between central telecom ministries and sectoral regulatory bodies

Vertical specific

- Automotive
 - Standards for stage 4 and 5 (genuine autonomous driving vs. partial human oversight)
 - Tech agnostic
- Drones
 - Common standards – connectivity management and flight parameters
 - Air traffic control agreement
 - Tech agnostic
- Manufacturing
 - Common standards
 - Security thresholds



Read it!

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<https://www.gsmaintelligence.com/research/2018/06/5g-in-china-the-enterprise-story/678/>