

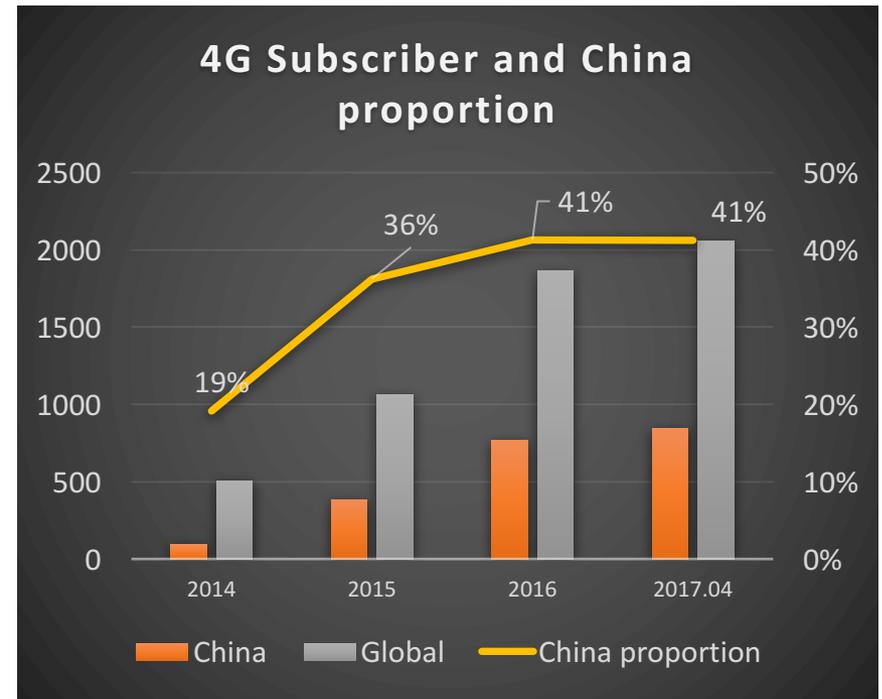
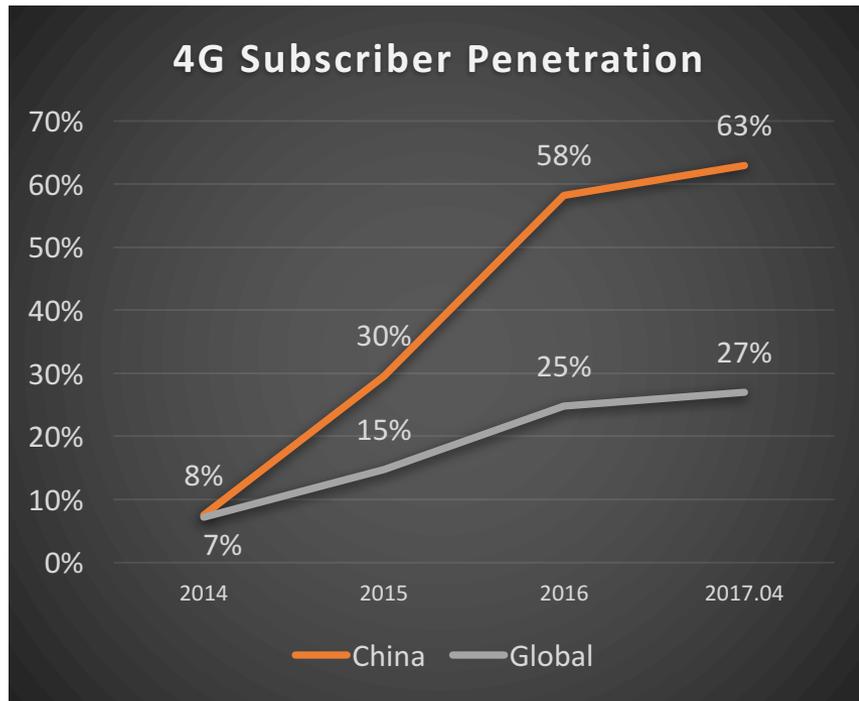
Work Together for 5G

WANG Zhiqin

June.2017



Mobile Broadband Market in China is Booming



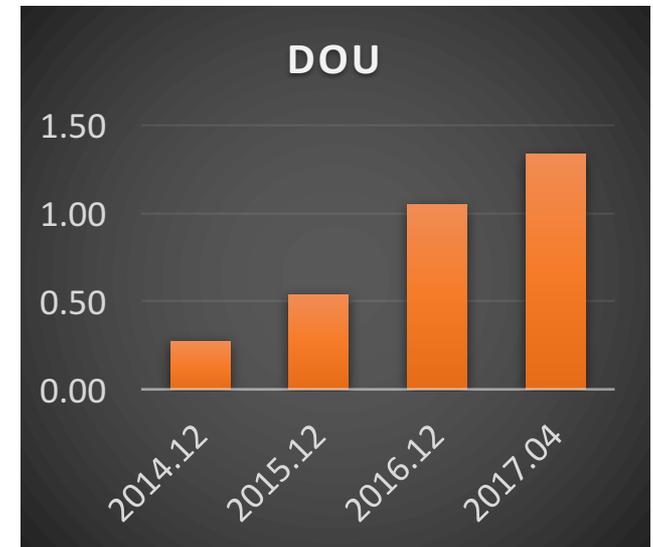
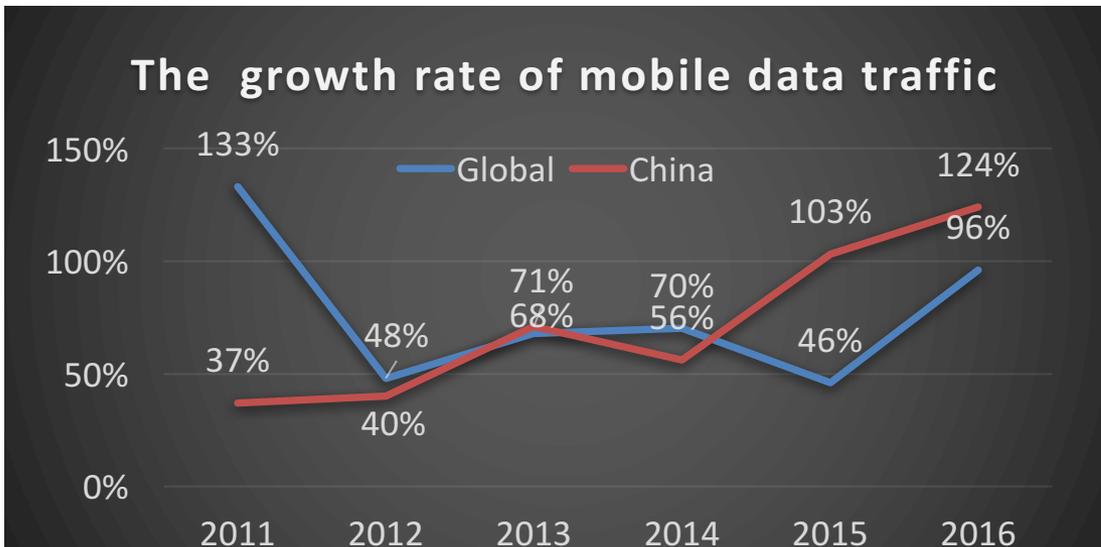
Source : GSMA,MIIT

- By the end of April 2017, 4G users in China had reached 849 million.

- The market share of Chinese users in the global 4G market rise to 41%.

The Growth of Mobile Data Traffic Reaches a New Level

- Mobile data traffic CAGR reached 92% in China from 2013 to 2016.
- The year-on-year growth rate was up to 124% in 2016. The growth rate will keep the speed in 2017.



Source : Cisco , MIIT

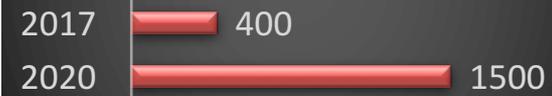
- By the end of April 2017, DOU reached 1.34GB, over two times than the same period of last year in China.

2017 , The First Year of NB-IoT to Launch

Government

- June 2017, MIIT issued a notice to promote mobile Internet (NB-IoT) construction, The goal of the NB-IoT in 2020 is to achieve national coverage.
- Chinese local governments actively promote the construction of the IoT

NB-IoT Base Station (thousand)



M2M connections (million)



Operators

- On May 17, China Telecom announced will Complete the upgrade of 310,000 base stations in June.
- China Mobile has launched NB-IoT field test in four cities in Shanghai, Guangzhou, Hangzhou and Fuzhou.
- China Unicom has been opened the NB-IoT pilot in Shanghai, Beijing, Guangzhou, Shenzhen and other 10 cities. Shanghai Unicom has the largest provincial NB-IoT commercial network in China.

5G Economic and Social Impact in China

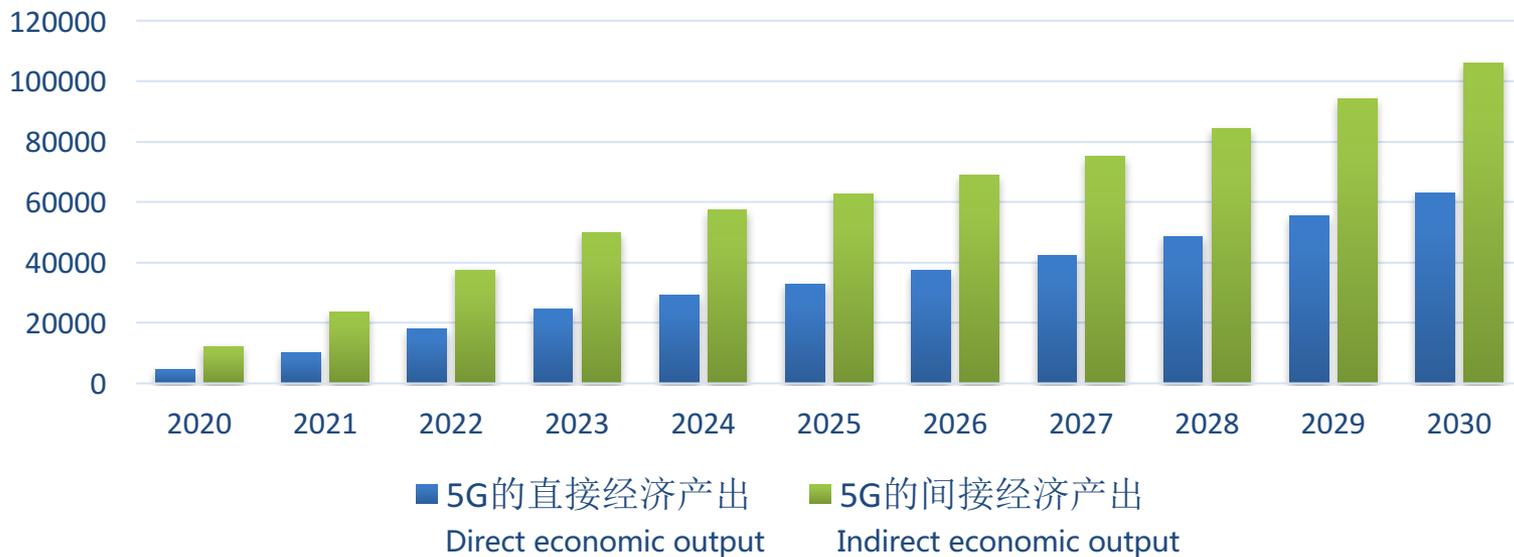
Y2030

**Direct Economic
Output
6.3 trillion**

**Indirect Economic
Output
10.6 trillion**

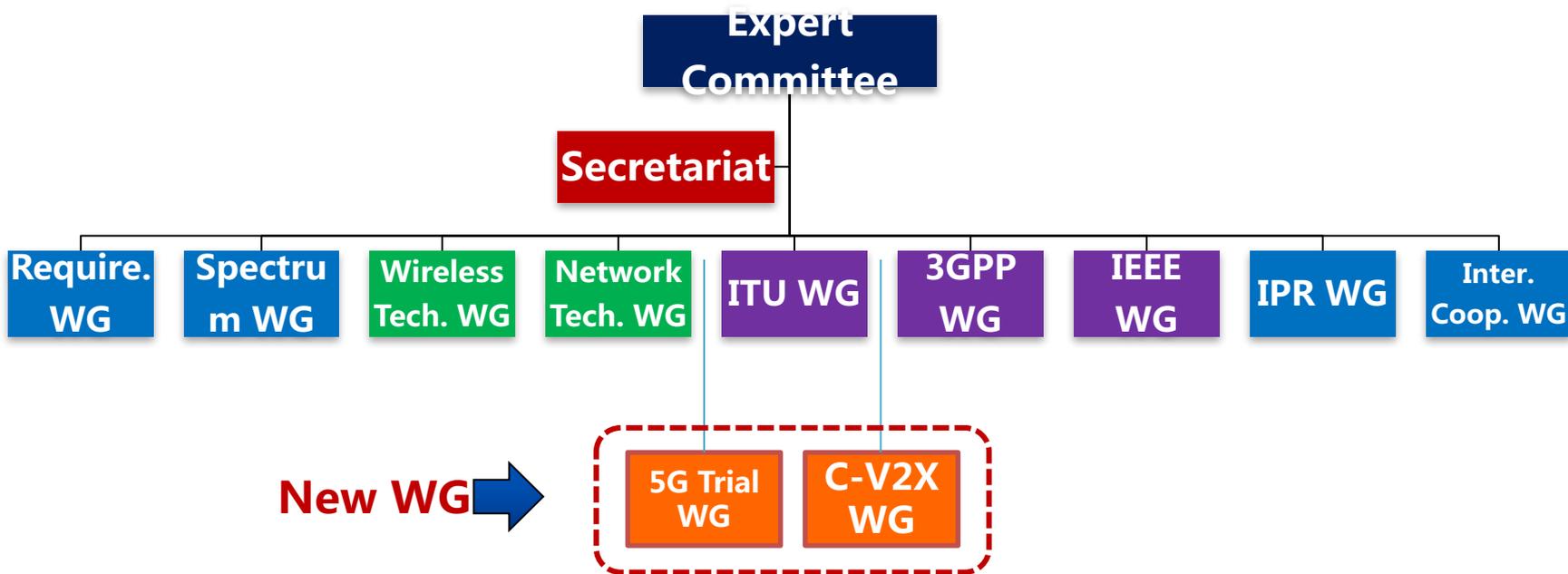
**Employment
opportunities
8 million**

5G Economic Output in China

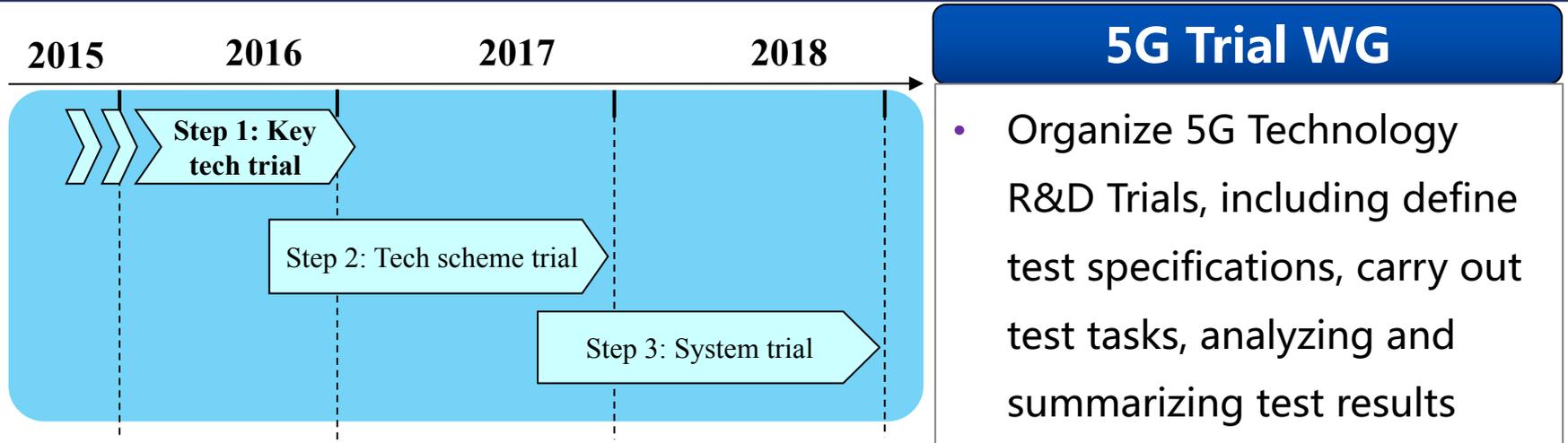


Source : *White paper on 5G Economic and Social Impact, CAICT, 2017.6*

IMT-2020 (5G) PG Structure Update

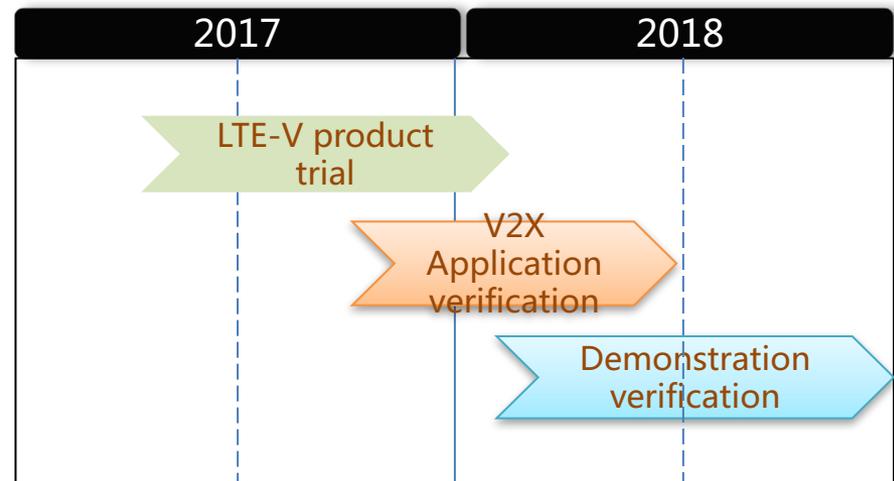


Responsibilities of the New WGs



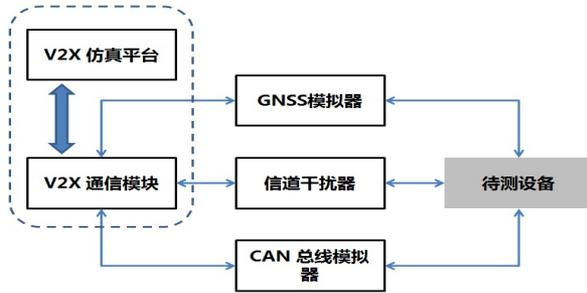
C-V2X WG

- Study cellular V2X solutions
- Accelerate C-V2X R&D via trials
- Promote C-V2X industrialization and application

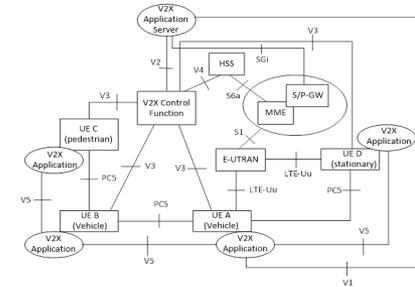


C-V2X WG : Main Tasks

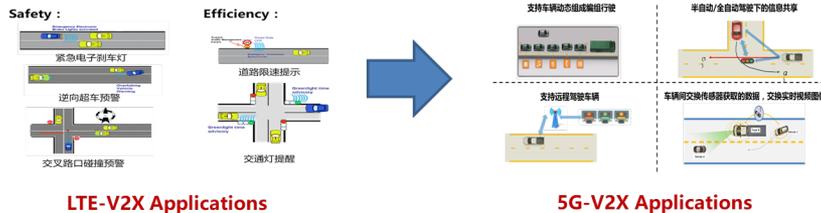
- Test the function, performance, interconnection and interoperation of LTE-V2X under lab, in-loop simulation and testing field.



- Research on the traffic modeling between C-V2X terminal and network, and the networking and implementation according to PC5、LTE-Uu interfaces



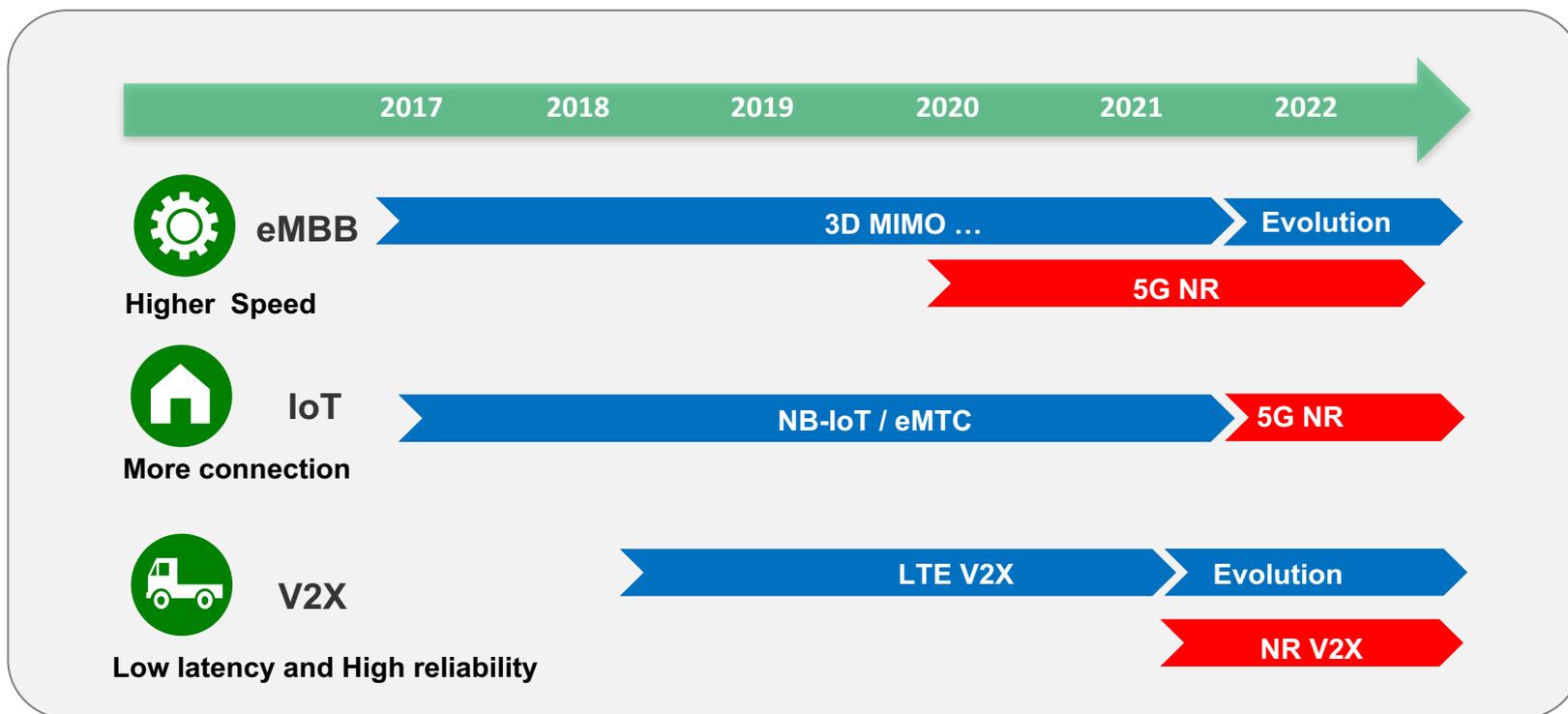
- Research on the strategy for LTE-V2X evolution and 5G-V2X, expedite the technical scheme design and standalization of IMT-2020



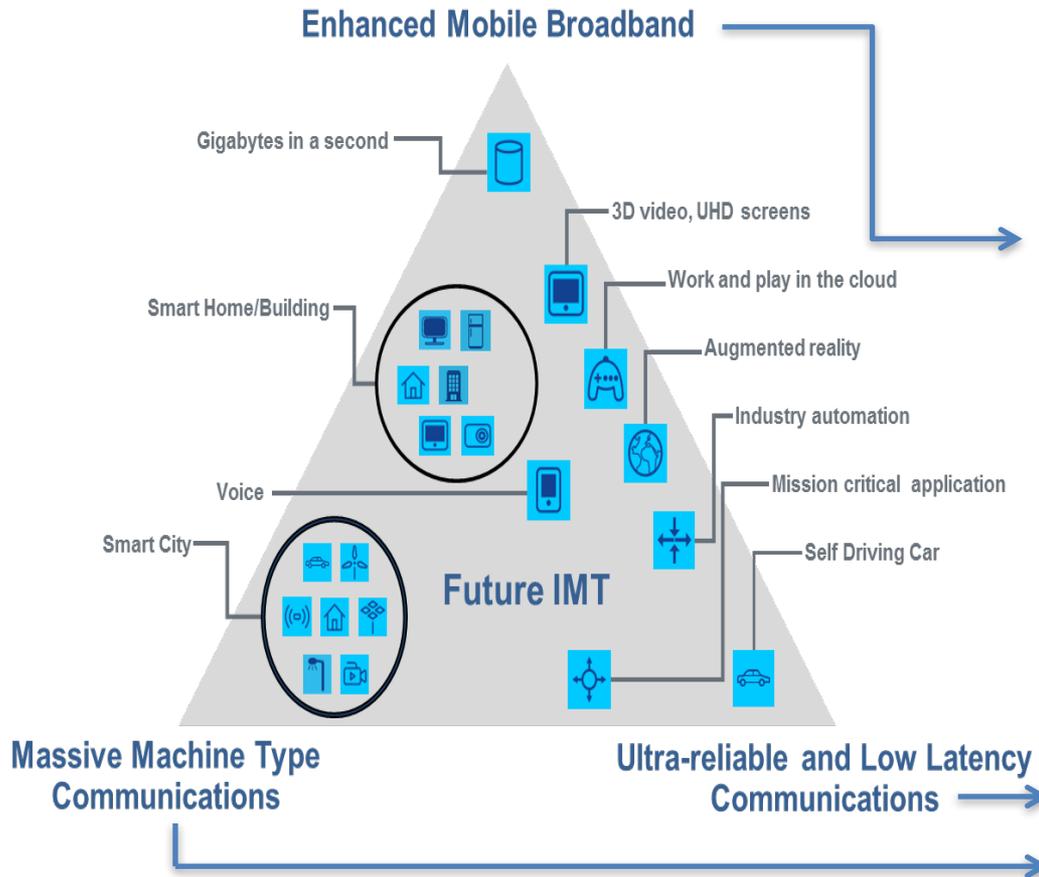
- Research on the new business model for C-V2X development



5G plans to commercialize in 2020



5G Spectrum vs. Scenarios



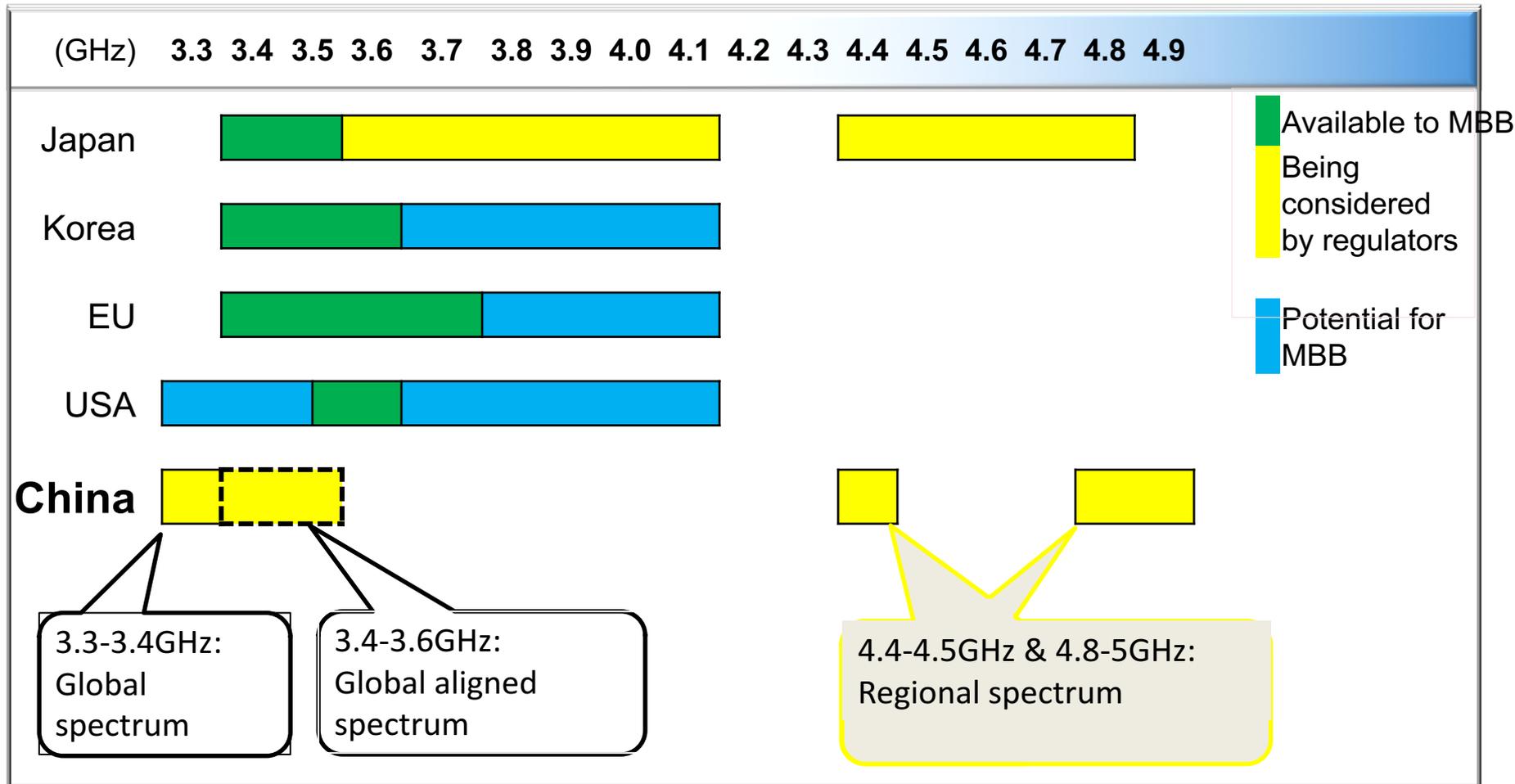
Test environment and suitable band

eMBB			
Indoor hotspot	Dense urban	Rural coverage	High speed
LF and/or HF	LF and/or HF	LF	LF

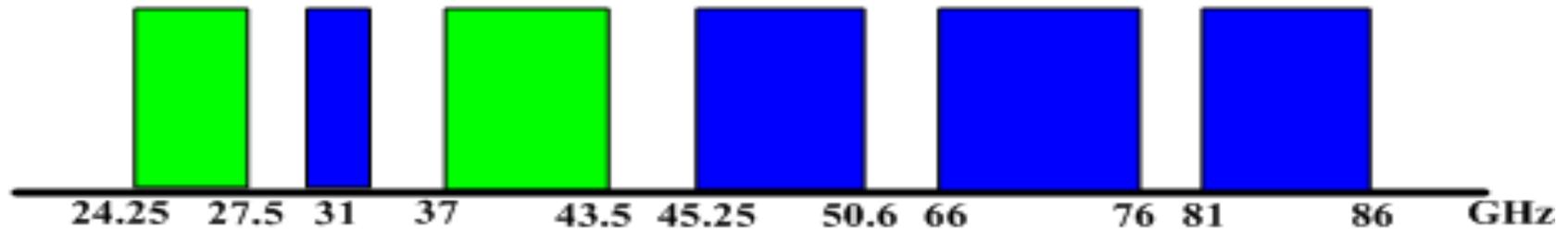
M-MTC	URLLC
Urban coverage	Urban coverage
LF	LF

- **LF (below 6GHz) could cover all the test environments.**
- **HF (above 6GHz) only covers indoor hotspot and dense urban test environments.**

Global C-Band Status



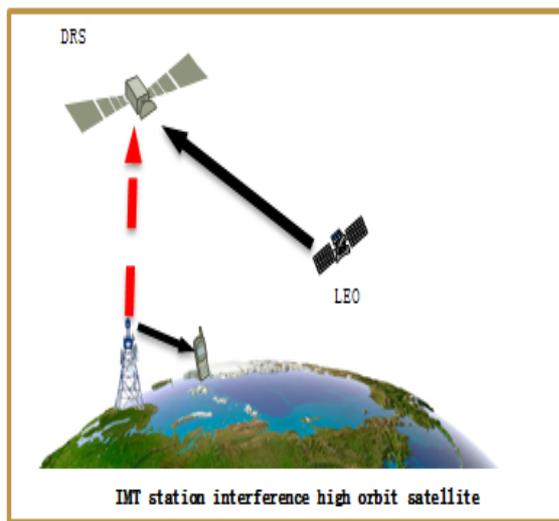
Spectrum Development on 5G in China-HF



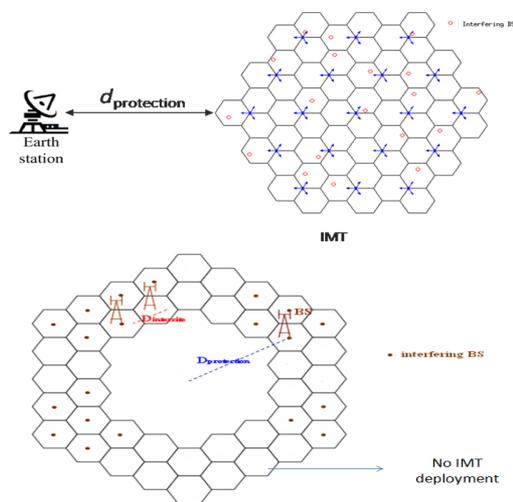
- ✓ High frequency bands are complementary 5G spectrum, focus on capacity boosting & self-backhaul.
- ✓ High priority for 20~40GHz for outdoor deployment.
- ✓ 26GHz and 40GHz are the key compatibility studying bands in IMT-2020(5G) Promotion Group

Compatibility Studies@26GHz &40GHz

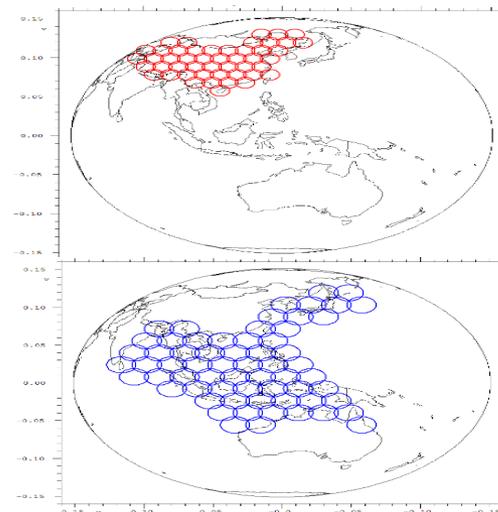
- Several compatibility studies are carrying out in IMT-2020(5G) Promotion Group based on the inputs from contributing WPs of WRC-19 Agenda Item 1.13.
 - ✓ IMT vs. Inter-Satellite Service (ISS), Earth Exploration-Satellite Service(EESS) and Fix Satellite Service(FSS) @26GHz band
 - ✓ IMT vs. FSS @40GHz band



IMT vs. ISS



IMT vs. EESS/FSS ↓ @
26&40GHz



IMT vs. FSS ↑ @
26GHz

About CAICT and Cooperation with GSMA

- CAICT is a professional think-tank for the government and an innovation & development platform for the industry.

Cooperation between CAICT and GSMA

✓ Joint report last year:

—*Mobile operators: the digital transformation opportunity*

✓ **Joint report this year:**

—***5G in China: outlook and regional comparisons***



CAICT and GSMA Joint Report—5G in China

- *the outlook for 5G in China,*
- *potential use cases in the consumer and enterprise segments,*
- *making comparisons with other leading markets,*
- *presenting forecasts and key future challenges*

Highlight

Use case

- Consumer: early deployments on eMBB
- Enterprise: the largest incremental opportunity

Deployment

- Different approaches (Standalone vs Non-standalone) to be adopted by different operators

Outlook

- New business models and near-term revenue outlook

Forecast

- From launch in 2020, we forecast that Chinese 5G connections will scale rapidly over time, to **reach 428 million** by 2025.
- The further growth will be determined by incremental network rollout and the price of 5G devices

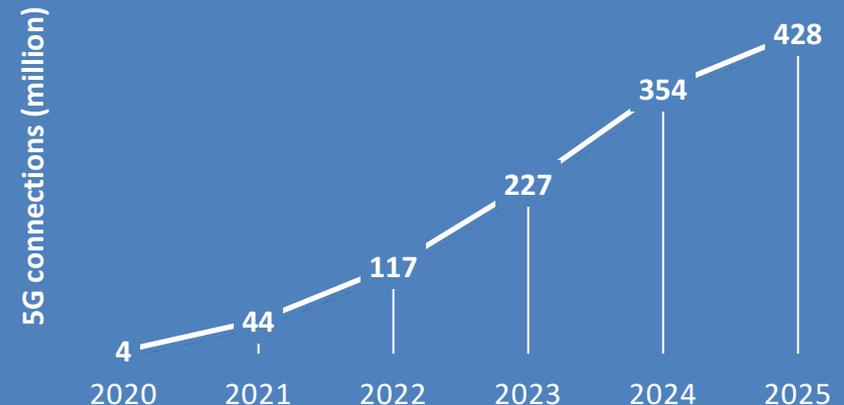


Figure: China – forecast for 5G connections