



Korea submission of IMT-2020 Candidate Technology



Ministry of Science and ICT

The world's first 5G commercialization



Apr. 2019

**Achieving smart
phone - based 5G
commercialization**

Dec. 2019

Feb. 2018

Jun. 2018

Sep. 2018

Dec. 2018

Challenging goal



Trial service at 2018
Winter Olympics,
Pyeongchang



Finished auction for
5G Spectrum



Certified 5G base
station equipment



Launched 5G
service using mobile
routers first

Trial Service at 2018 PyeongChang Winter Olympics



Provided **the world's first 5G trial service**
including immersive service, 5G autonomous buses, etc. (Feb. 2018)



Time Slice



Omni View



Autonomous 5G Bus



Sync View






360° VR Live

5G Frequency Auction and System Maintenance



- Established the basic plan for **frequency allocation** more than **one-year earlier than the initial plan** (~Apr. 2018) and put it up for auction (Jun. 2018).
- Revised **the standard for radio equipment** tech (~Aug. 2018), revised the conformity assessment notification (Jul. 2018) → Appointed a **5G equipment certification** testing institution (Sep. 2018)

⇒ The result of 5G frequency auction ⇐

| | 3.5GHz | 28GHz |
|---|--------|--------|
|  | 100MHz | 800MHz |
|  | 100MHz | 800MHz |
|  | 80MHz | 800MHz |

First 5G Emission Release



Promoted the frequency auction (Jun. 2018), base station equipment certification (Oct. 2018) and started **Mobile router-based B2B 5G commercial service** (Dec. 1st 2018)

First member of 5G commercial service of each mobile service company

Dec. 2018



SK telecom

Myunghwa
(smart factory)

kt

5G robot, 'Rota'

LG U+

LS Mtron
(remote control tractor)

Current 5G service since commercialization



Galaxy S10 5G



Galaxy Fold



Galaxy Note10+



LG V50 thinQ

Apr. 3

Now

Coverage

Installed on a **national scale** at **densely populated areas**, of major cities including Seoul, the capital area, some metropolitan cities, etc.

Number of members exceeding **3 million people** (as of Sep. 9)

Stations

45,622 (as of Apr.5)

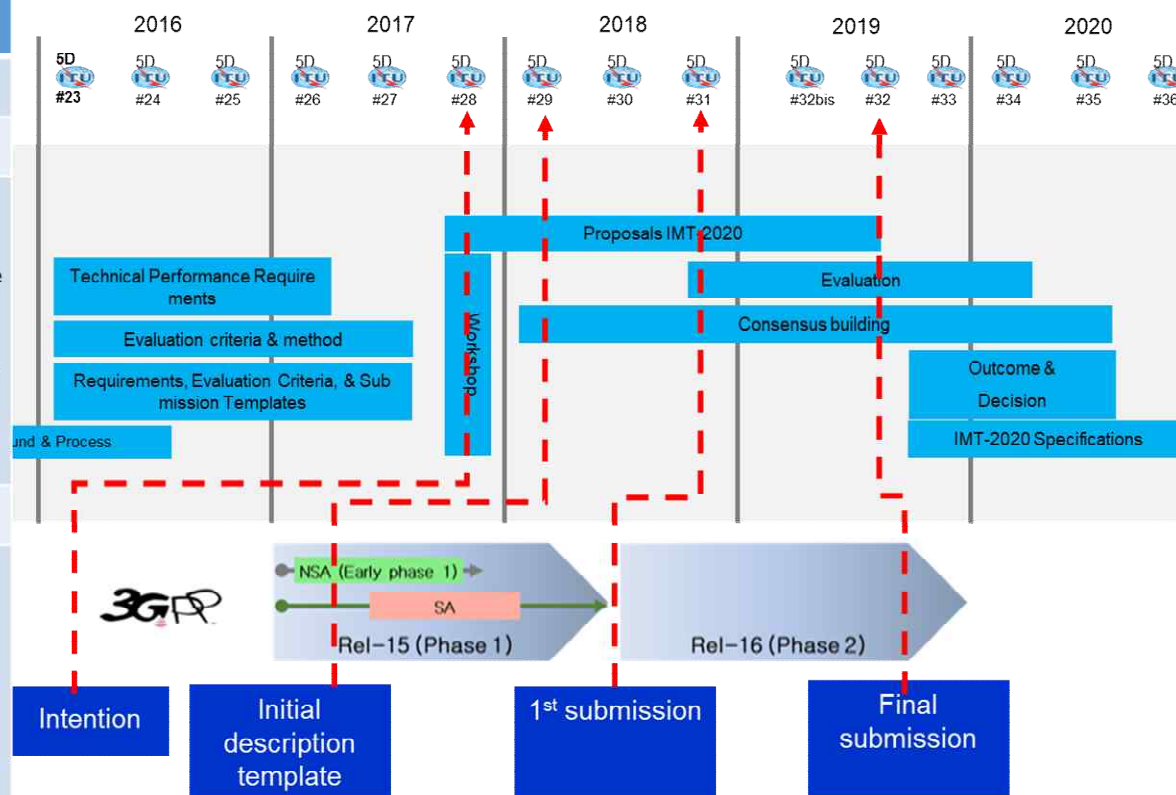
90,161 (as of Sep.13)

ITU 5G(IMT-2020) Technology / Spectrum Std. Plan



As a member of the ITU, Korea proposed a candidate IMT-2020 technology in accordance with the relevant ITU process.

| No. | Input contributions | Remarks |
|--------------|--|--|
| WP 5D #29 | 5D/819 | Initial description template |
| WP 5D #30 | - | No update information in this meeting |
| WP 5D #31 | 5D/1077 (Attachment Part 1: 5D/1077!P1; Attachment Part 2: 5D/1077!P2; Attachment Part 3: 5D/1077!P3; Attachment Part 4: 5D/1077!P4) | <ul style="list-style-type: none"> • IPR Policy compliance • Updated characteristics template • Initial link budget template • Initial compliance template • Endorsement of preliminary self-evaluation report 3GPP TR37.910v1.0.0 |
| WP 5D #31bis | - | No update information in this meeting |
| WP 5D #32 | 5D/1233 (Attachment Part 2: 5D/1233!P1; Attachment Part 3: 5D/1233!P2; Attachment Part 4: 5D/1233!P3) | Final submission <ul style="list-style-type: none"> • IPR Policy compliance • Declaration of versions • Final characteristics template • Final link budget template • Final compliance template • Endorsement of self-evaluation report 3GPP TR37.910v16.0.0 |



Overview : Korea IMT-2020 candidate technology



The Republic of Korea provides the final submission of a candidate RIT of IMT-2020 in accordance with the latest 3GPP New Radio (NR) Technical Specifications (Release 15 and 16).

| Items | | Contents |
|---------------------------------------|---------------------------|--|
| Compliance with the ITU policy on IPR | | Regarding the matters of IPR policy compliance, the Republic of Korea delegates authority to TTA. |
| Description Template | Characteristics Template | 27 items for 5G characteristics provided based on TTA Technical Specifications (3GPP 5G NR Rel-15 & Rel-16). |
| | Link budget template | Link budget for 3GPP 5G NR RIT (Channel Model A & B) provided. |
| Compliance Template | for service | The NR RIT can support eMBB, URLLC and mMTC usage scenarios. |
| | for spectrum | The RIT will be capable of supporting IMT identified bands including frequency bands (n77: 3.3-4.2GHz / n78: 3.3-3.8GHz) of 3GPP. |
| | | The RIT will be capable of supporting higher frequency range/band(s) (n257: 26.5-29.5GHz / n258: 24.25-27.5GHz) of 3GPP. |
| | for technical performance | For NR RIT, all minimum technical performance requirements items are met with required value. |
| Self Evaluation | | The Republic of Korea endorses 3GPP self-evaluation (3GPP TR 37.910 V16.0.0). |

Observation : Korea IMT-2020 candidate technology



- ❖ WP5D has so far identified at WP 5D Meeting #32, in its review of the Korea Proponent submissions in Document 5D/1233 no submission deficiencies and technology issues which impact the submission and the ability of WP5D to have the submission move forward in the IMT-2020 process
- ❖ Regarding the Document 5D/1233 from the Republic of Korea, this candidate technology submission is technically the same as the candidate technology submission provided in Document 5D/1217 (3GPP NR RIT).
- ❖ WP 5D has concluded that because Documents 5D/1233 and 5D/1217 are technically identical submissions a single evaluation is applicable for both.

Next Steps for Step 7 & 8



- ❖ As indicated before, the Republic of Korea provided the final submission of a candidate RIT of IMT-2020 in accordance with the latest 3GPP New Radio (NR) Technical Specifications (Release 15 and 16).
- ❖ For consensus building and decision (Step 7), Korea Proponent submissions in Document 5D/1233 can be considered as technically identical one to the candidate technology proposal of Document 5D/1217 (3GPP NR RIT).
- ❖ As provided for in IMT-2020/20(**Process and the use of Global Core Specification...**), the GCS Proponent for the “NR RIT” in Step 8 will be “ARIB, ATIS, CCSA, ETSI, TDSDI, TTA, and TTC on behalf of 3GPP”. For the development of M.[IMT-2020.SPECS], TTA, on behalf of 3GPP and Korea, will contribute it as one of the GSC proponent and Transposing organization of 3GPP technology. (See next slide for detailed timeline)

Next Steps for Step 7 & 8 (Cont'd)



- ❖ In accordance with Document IMT-2020/21, the Republic of Korea will proceed future works to contribute finalization of Recommendation ITU-R M.[IMT-2020.SPEC]
 - ❖ RIT Proponent: Republic of Korea (Form A)
 - ❖ GCS proponent: TTA/3GPP (Certification B)
 - ❖ Transposing Organization: TTA (Certification C)

| WP5D # | WP 5D #33 (Feb 2020) | WP 5D #34 (Jun 2020) | WP 5D #36 (Oct 2020) | WP 5D #36bis (Nov 2020) |
|-------------------------------------|-------------------------|---|--|----------------------------|
| Deadline | 12 February 2020 | 17 June 2020 | 8 October 2020 | 10 November 2020 |
| IMT-2020 Process Step | Complete Step 4 | Start Step 8 | | Complete Step 8 |
| Key Deliverable and Action by | Form A (by KOR) | GCS and Certification B (by 3GPP/TTA) Overview Section (by 3GPP) | Transposition References and Certification C (by TTA) | |

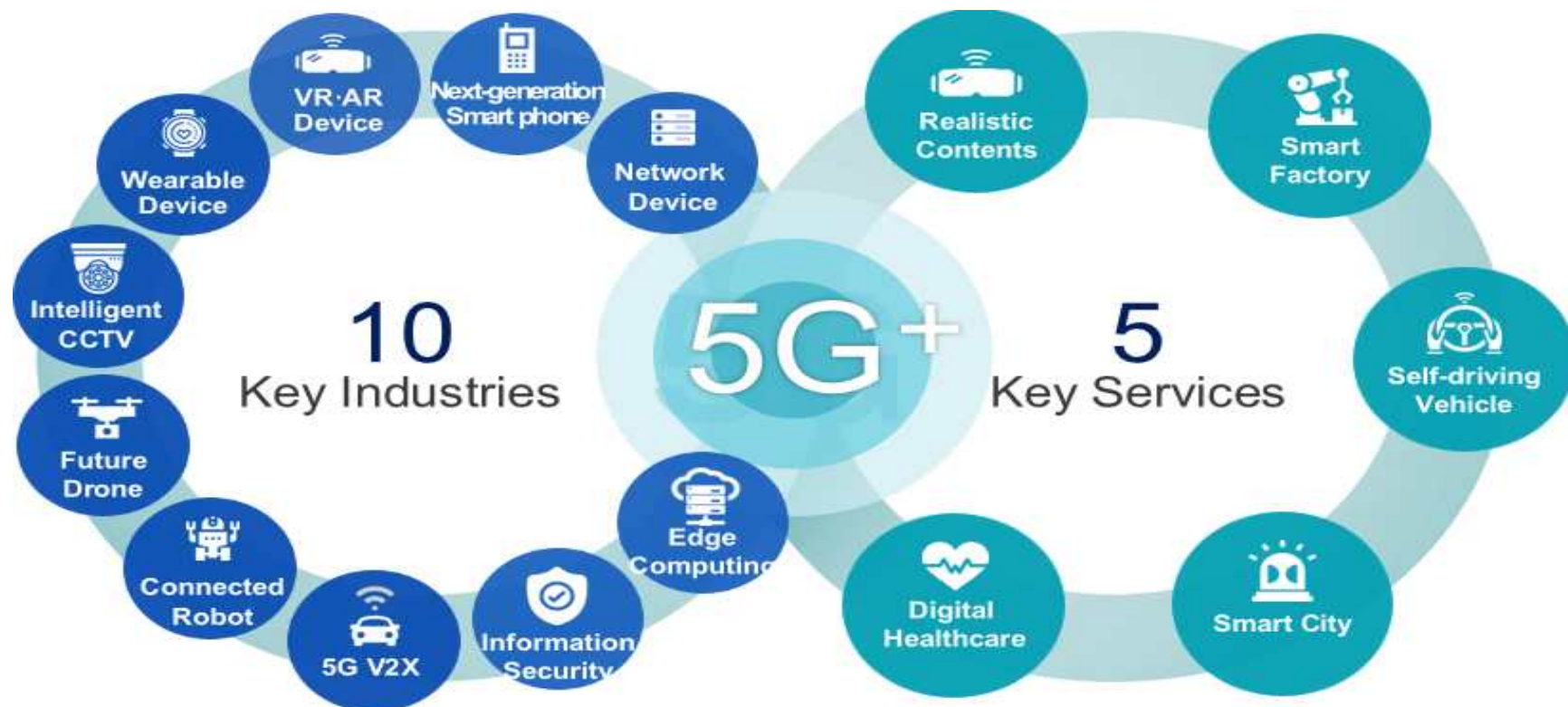
Views on 5G(IMT-2020) Technology and Spectrum



● Harmonization is essential for 5G IMT-2020 :

- 3GPP (Rel. 15/16/17) standard technology
- 26 /39 GHz spectrum global identification in RR for value creation

● 5G vertical is essential for 4th Industry Revolution





Thank you.