5G Forum: Status Quo

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Rome

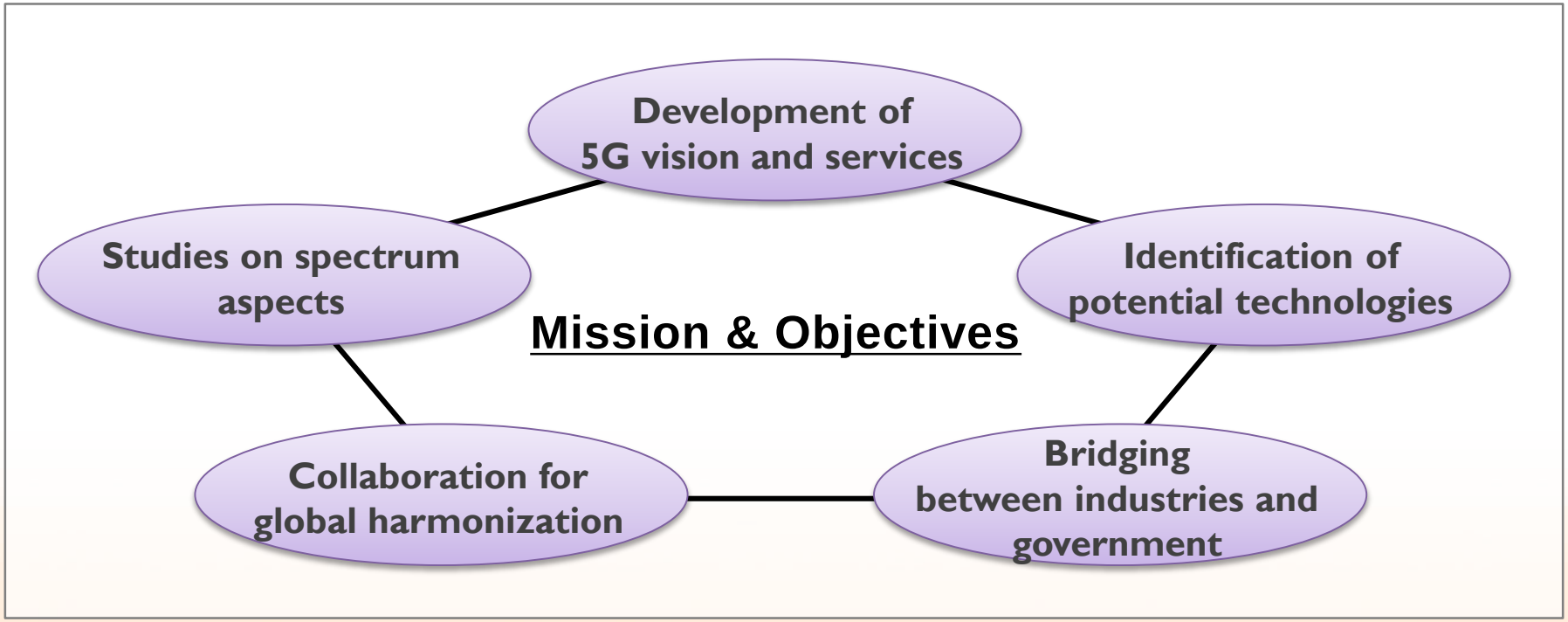
5G Forum

5G Forum:Vision & Mission

Global Leadership and Promotion

in 5G Mobile Communications towards 2020s

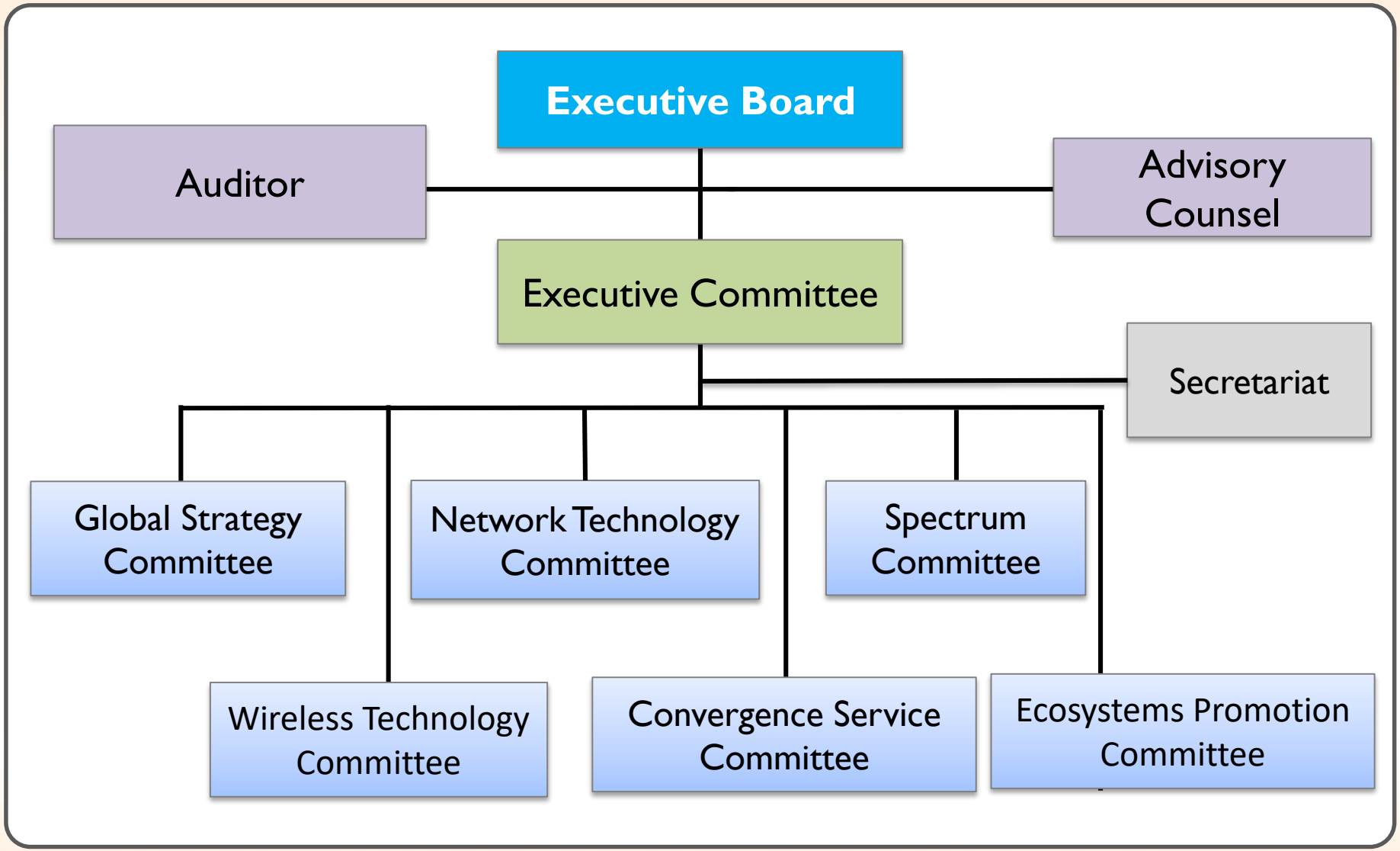
Vision



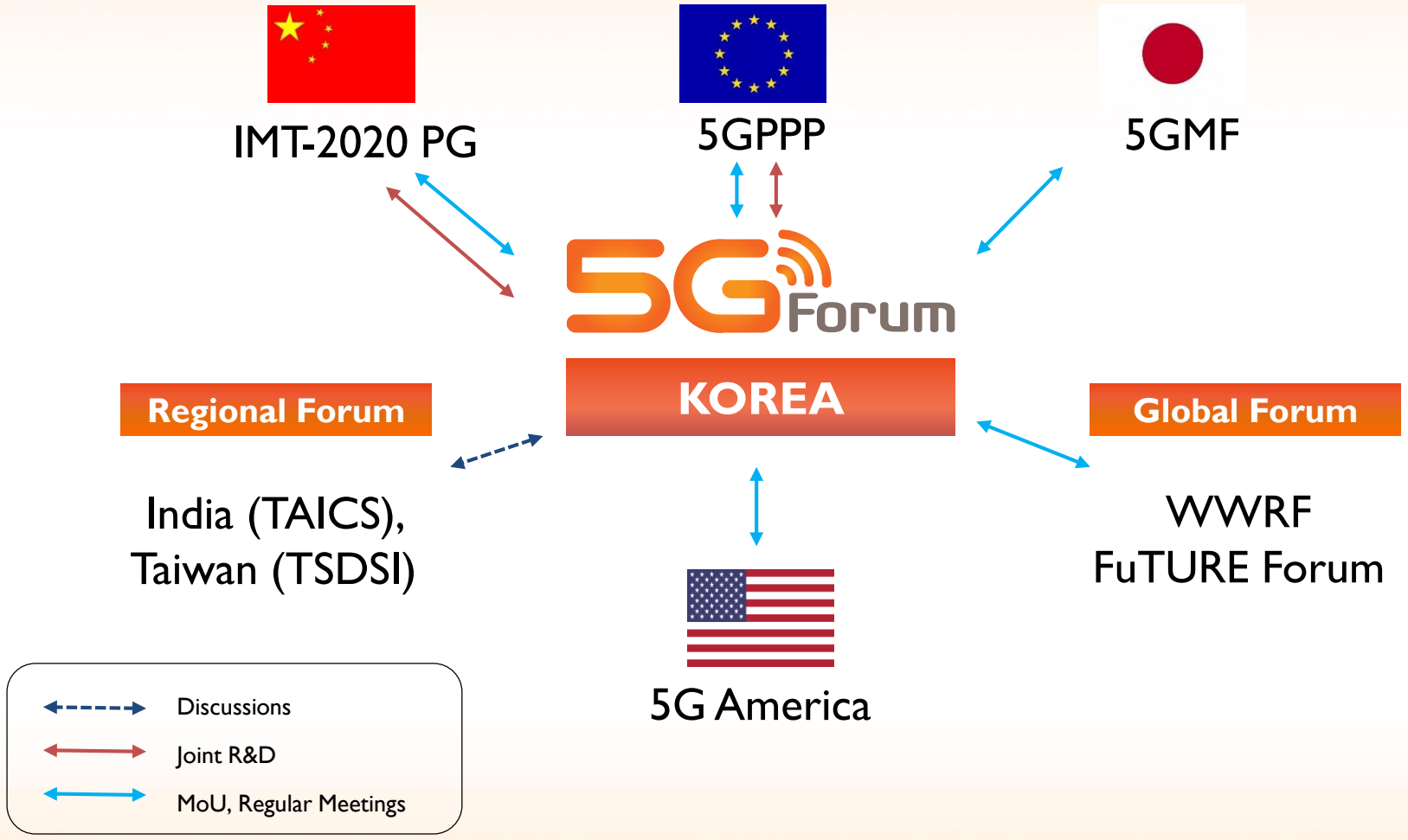
5G Forum: Organization (I)

- **Public private partnership for the promotion of 5G Mobile communications**
  - Established May 30, 2013, Seoul
- **Members (31 organizations/companies, as of September 2016)**
  - Private sector: Operators, Equipment (Handset, network) vendors,
  - Research institutes: ETRI, IITP, GiGa Korea
  - Universities: KAIST, Yonsei, Korea, etc.

5G Forum: Organization (II)



5G Forum: Collaborations



5G Forum: Major Activities

2016	**March**	5G Open Symposium 2016 hosted
		Publish 5G White Paper Version 2
	April	3rd Korea-China joint 5G R&D Meeting
	May	2nd 5G Forum-FuTURE Forum 5G Technical Exchange Meeting
		The 1st Global 5G Event-China
	June	5G Forum Internal Workshop hosted
		5G Forum Ecosystem Promotion Committee Established
	August	5G Forum-TTA PG906 5G Network workshop hosted
	October	5G Global Summit 2016 hosted (Asia-Pacific Vision toward 5G & 5G Vertical Markets)

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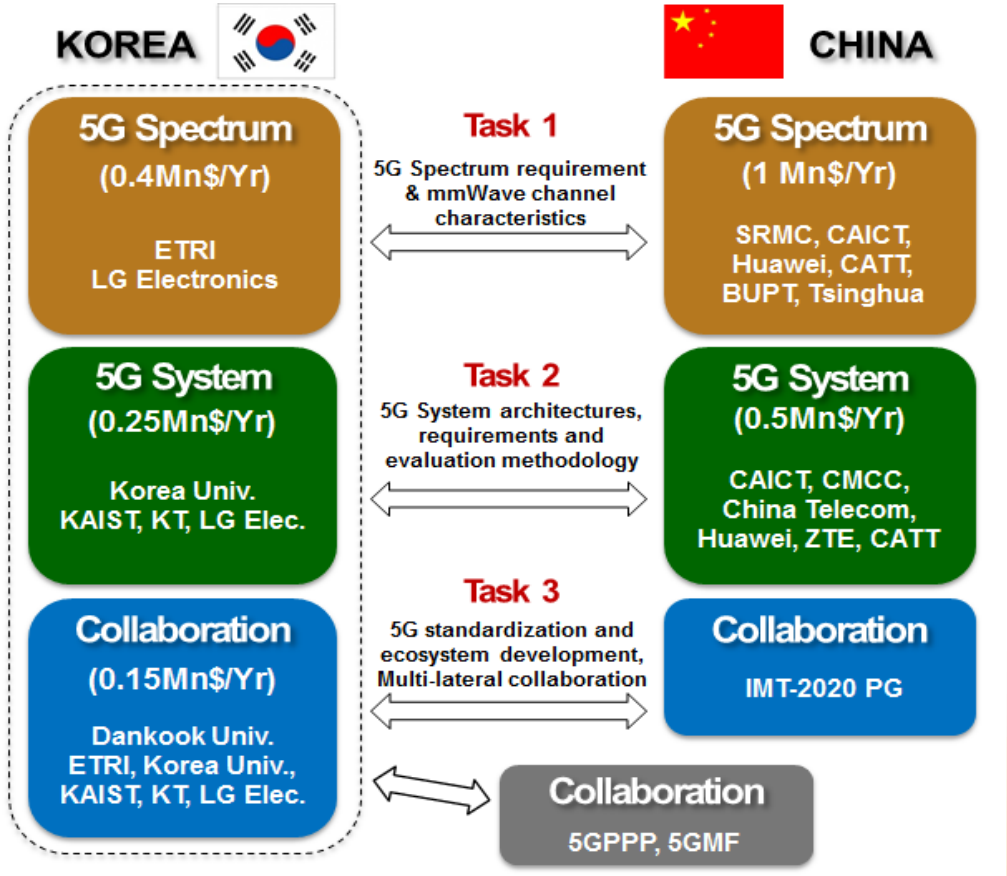
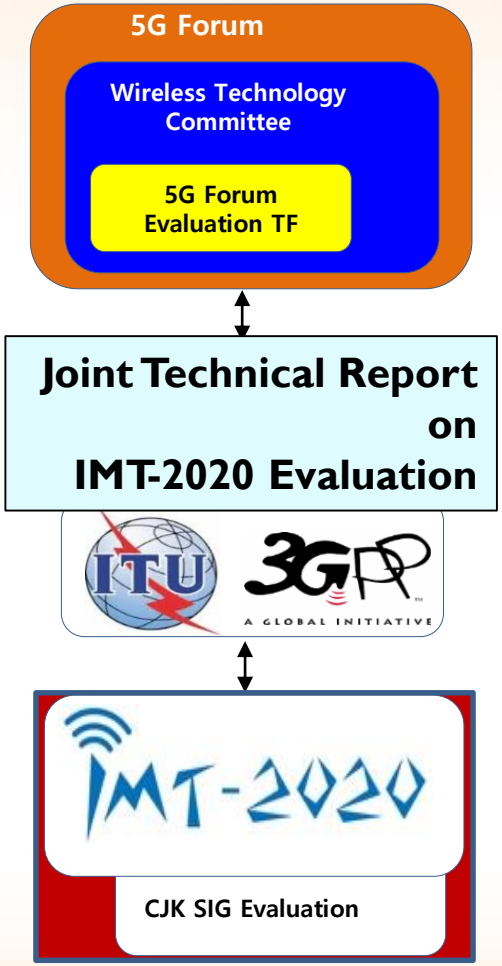
Korea-China Joint 5G R&D

- **Korea-China Cooperative Research**
  - Project launched in June 2015
  - 1.6 M$/2 years [2015-2016]
  - Principal Investigator: ETRI





Korea-China Joint 5G R&D

Activities and discussions

- Kick-off meeting in Harbin, July 2015
  - CJK meeting in Sept. 2015 Chengdu
- 2nd Joint research meeting, Dec. 2015 Chongqing
  - CJK meeting in Jan. 2016 Jeju
  - ITU-R WP-5D meeting in Feb. 2016 Beijing
- 3rd Joint research meeting, April 2016 Jeju
- 4th Joint research meeting, Nov. 2016 Shanghai

Korea-China Joint 5G R&D

Major Achievements

- Joint Contribution
  - ITU-R WP5D Contribution Document 5D/23-E : "Proposal on skeleton of new report M.[IMT-2020.eval]"
- Joint Report
  - Joint Technical Report in IMT-2020 Evaluation
- Activities in WP-5D
  - Several contributions from two countries
  - Chairpersonships from two countries

Korea-EU Joint 5G R&D

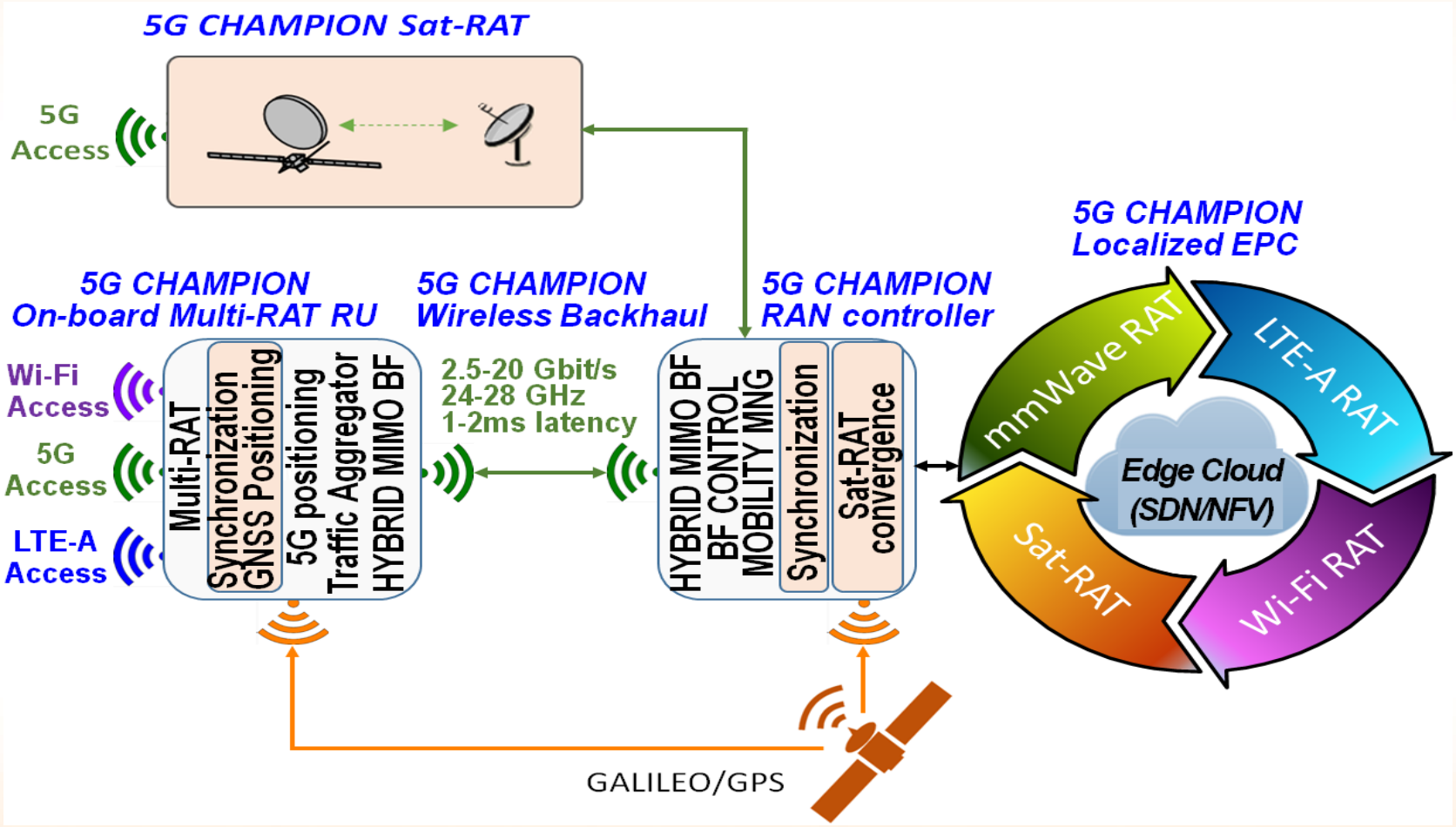
5G CHAMPION

5G Communication with a Heterogeneous, Agile Mobile network in the Pyeongchang wInter Olympic competitioN

Phase I launched Oct. 2015 (2016~2017),
Korean PI: ETRI

Korea-EU Joint 5G R&D

5GCHAMPION Concept



Korea-EU Joint 5G R&D

5GCHAMPION System Objectives

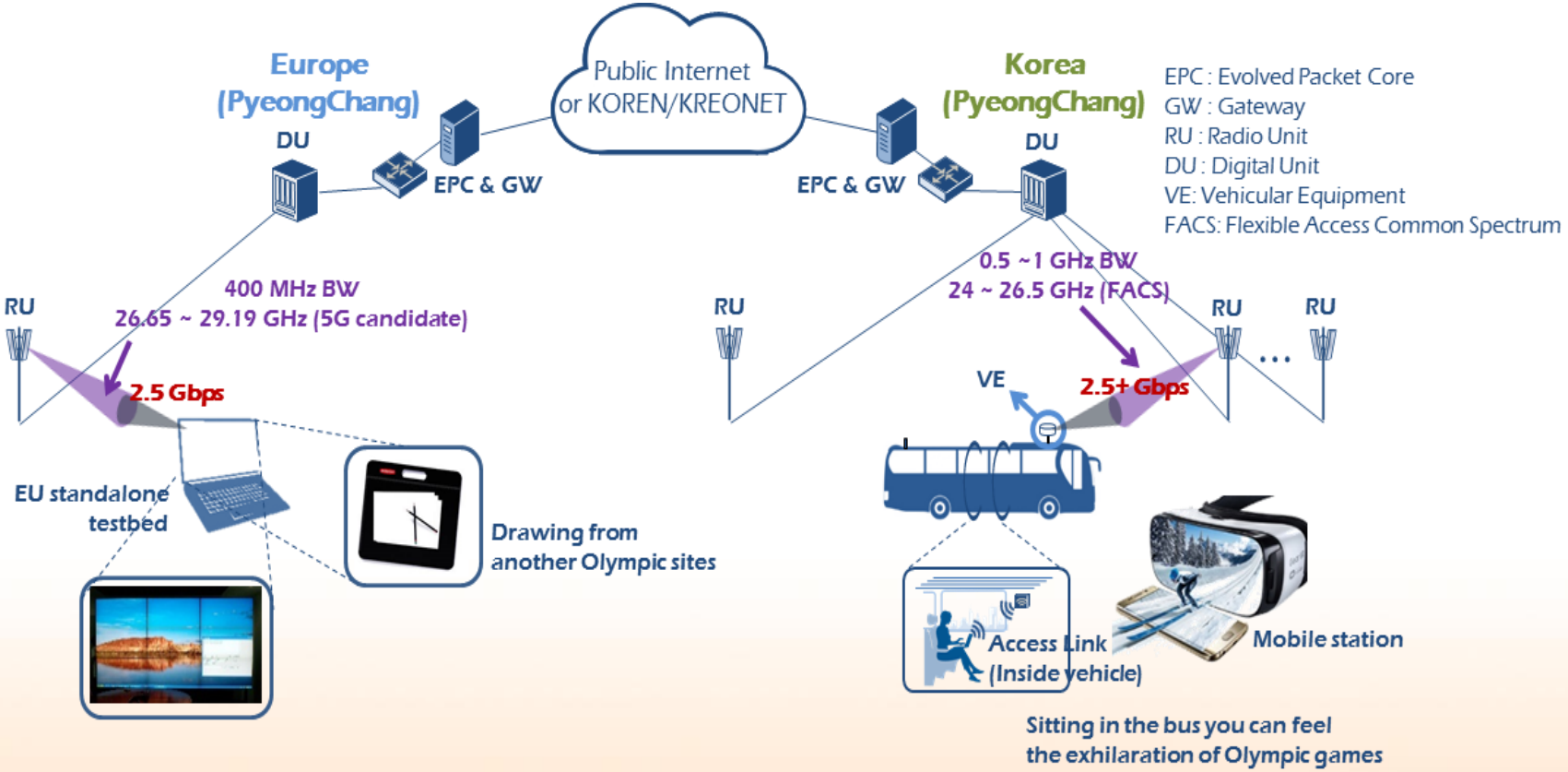
- Developing the first 5G system PoC in 2018 Winter Olympics
- Contribution to 5G global standardization
- Contribution to regulations within ITU study Groups, ETSI RRS, TCAM
- Synergy for 5G research, Innovation and Commercialization

Item	Goal
Maximum data rate over mmWave link	**20 Gbps**
Data rate over a wireless mmWave backhaul link	**2.5 Gbps**
User-experience in moving hot-spots	**100 Mbps**
Seamless access to satellite communications for 5G devices	**support**
latency over the 5G wireless backhaul link	**1~2 msec**
Agile management of core network functionality and services	**support**
Ubiquitous (indoor-outdoor) location accuracy	**< 1 m**

Korea-EU Joint 5G R&D

PoC and Service Scenario

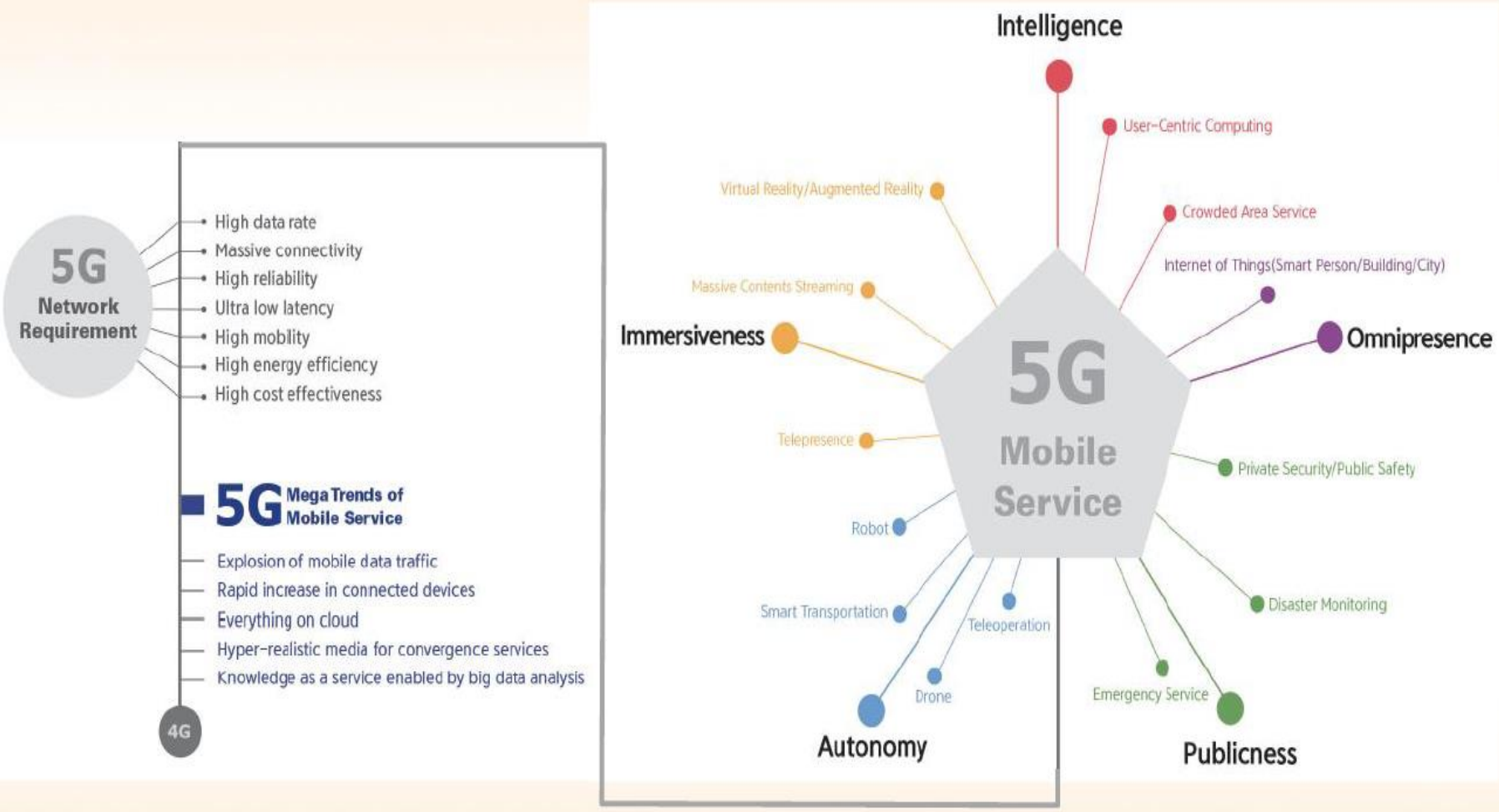
- PoC will be deployed in IoT Street (nearby Olympic venue)
- VR/AR service on the move
- Real-time gaming service



Global Strategy Committee

- On April, 17 in Jeju, Korea, 3rd C-K collaboration meeting
- Shared 5G KPI, service and technology requirements
- Agreed to prepare joint R&D for 5G

Convergence Service Committee



- **Key Performance Indicators (KPI's) in 5G Forum**

	Key Performance indicators		Values	Note
Wireless Network	(R1) Spectral efficiency	bps/Hz	3 x 4G	≈ 10 bps/Hz
	(R2) Peak data rate	bps	20Gbps	
	(R3) User experienced data rate	bps	100Mbps (outdoor) 1Gbps (indoor)	
	(R4) Latency	ms	1 ms	Latency over radio interface
	(R5) Mobility	km/h	500 km/h	
	(R6) Handover interruption time	ms	10 ms	
	(R7) Areal capacity	bps/m^2	10 Mbps/m^2	
	(R8) Energy efficiency	Joules/bit	100 x 4G	
	(R9) Connectivity	connections	10^6 connections/km^2	
	(R10) Positioning	cm	[TBD]	
Core Network	Reliability	[TBD]	[TBD]	- Radio link failure (RLF) - Service availability - Recovery time

Network Technology Committee

Enhanced User Experience

- Provides higher data rate and lower latency communication services
- Utilizes the context information with ABC (always best connected)

Connecting Various Types of Devices to Network

- Flexible so that variety of 5G mobile devices with divergent network requirements can be served by a single network infrastructure

Flexible & Programmable Network for New Services

- Provides virtualization environment and support reconfiguration and upgrade at low cost without changes in physical network infrastructure.
- Programmable to enable innovative services/contents/applications

Spectrum Committee

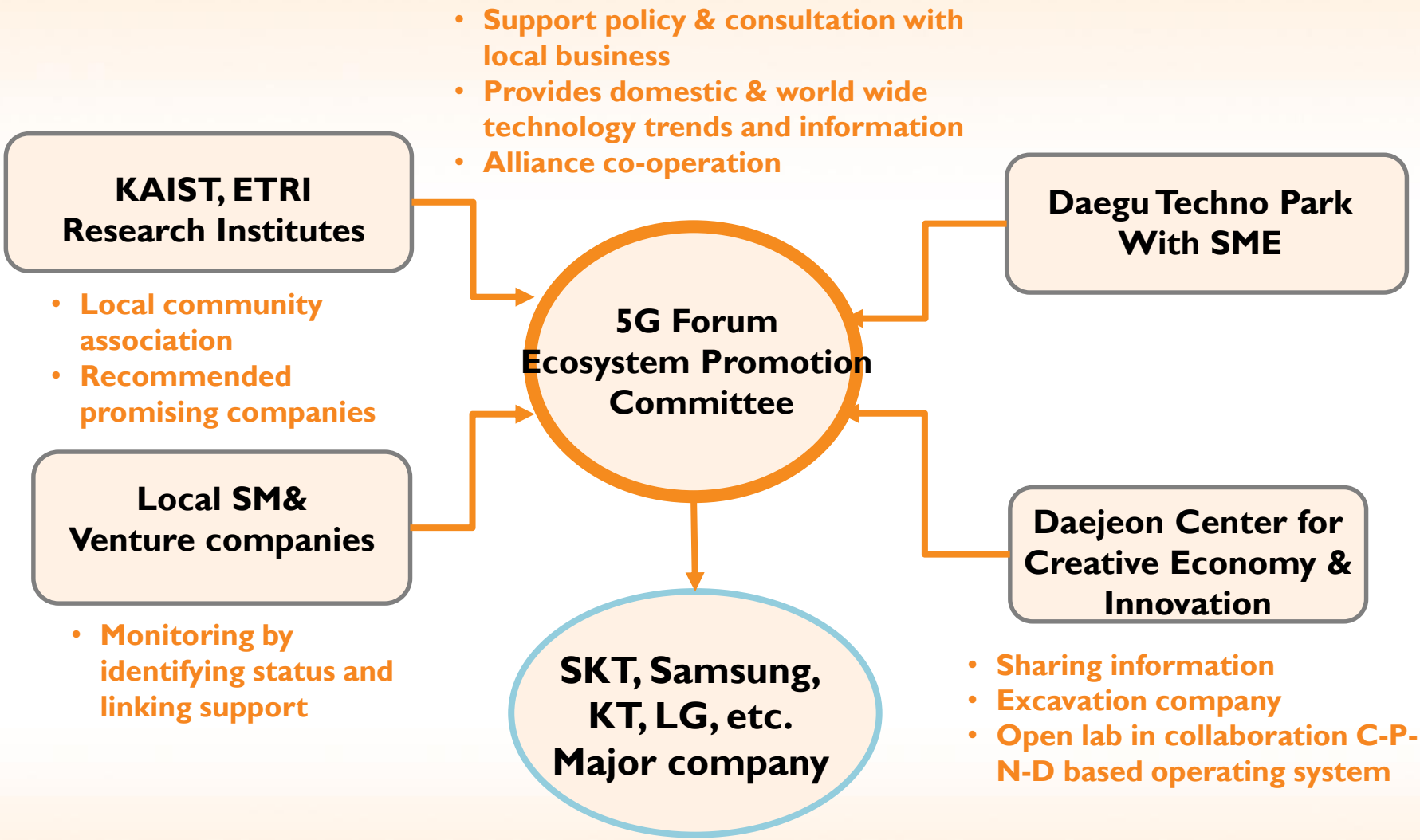
Joint Work between China and Korea

- Develop Common Calculation Methodology of Spectrum Requirements
- Propose the Methodology to ITU

- Calculate Spectrum Requirements for China and Korea
- Compare (and Adjust)

- Find Common SFR (eg. Several hundreds MHz in xx GHz)
- Propose the SFR to WRC

Ecosystem Promotion Committee



Thank you.