

Public Safety Network

SAFENET, KOREA

at PSCE Conference, May 23-24 2018, Brussels, Belgium,

Changho RYOO (chang@tta.or.kr)

Chair, Global Outreach Committee, SAFE-Net Forum

Republic of Korea

23th May 2018

Content

I. Overview

II. Korean MOIS presentation

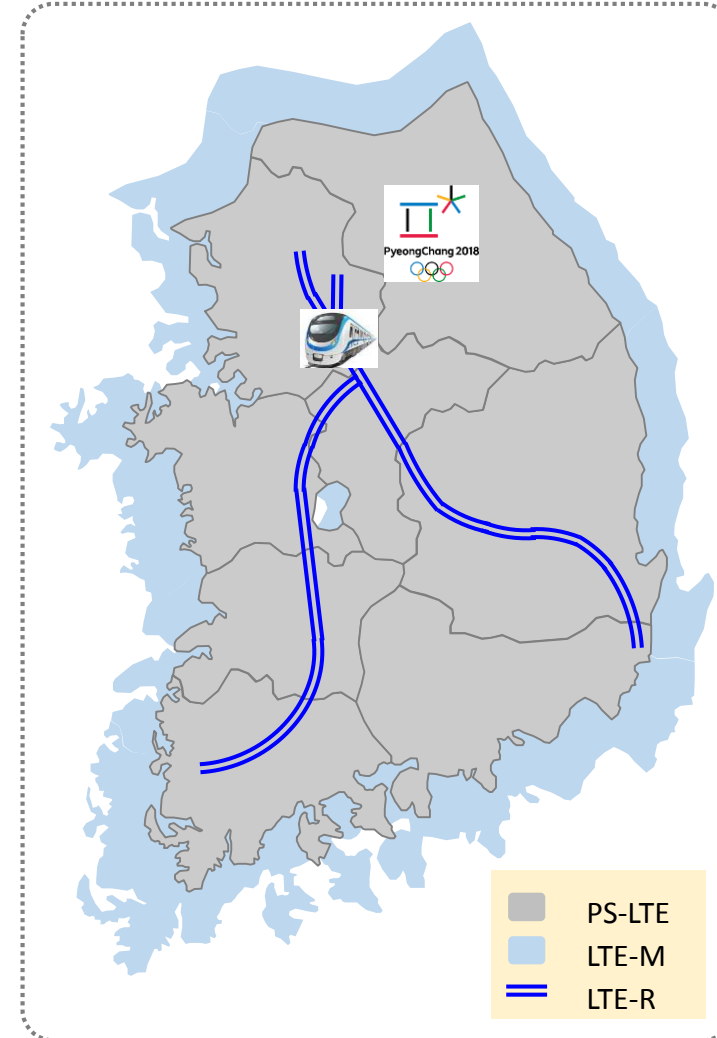
Prepared and presented by JIN-HONG, SIM
Korea SafeNet project Division, MOIS
Republic of Korea

Appendix: Safe-Net Forum

I. Overview

LTE-based public safety networks in Korea

- 700MHz frequency bands
 - UL : 718 MHz ~ 728 MHz
 - DL : 773 MHz ~ 783 MHz
- 3 public safety networks over LTE
 - PS-LTE (Public Safety LTE)
 - LTE-R (LTE-Railway)
 - LTE-M (LTE-Maritime)



II. Korean MOIS presentation

Prepared and presented by JIN-HONG, SIM, Korea SafeNet project Division, MOIS, Republic of Korea

Korean MOIS presentation (1/18)



The slide features a blue background with a circular pattern of overlapping circles and lines. In the top left corner, there is a logo consisting of a red and blue swirl, followed by the text "Ministry of the Interior and Safety". The main title "KOREA SAFENET" is written in large, bold, dark blue capital letters, with "(P S - L T E)" underneath it in smaller, bold, dark blue capital letters. Below the title, the date "4th Apr. 2018" is displayed in a smaller font. The name "JIN-HONG, SIM" is written in bold, dark blue capital letters. At the bottom, the text "Director, Korea SafeNet project Division, MoIS" is written in dark blue, with "SafeNet" and "MoIS" underlined.

 Ministry of the Interior
and Safety

KOREA SAFENET


(P S - L T E)

4th Apr. 2018

JIN-HONG, SIM

Director, Korea SafeNet project Division, MoIS

Korean MOIS presentation (2/18)



Contents

- I. Korea Safe-Net Status**
 1. Concept of Korea Safe-Net
 2. Milestone
 3. Deployment Plan
 4. Coverage Expansion Solutions
- II. Pilot Project**
 1. 1st Pilot Project
 2. 2nd Pilot Project
 - Goal
 - Strategy
 - Main Works
- III. Future Plan**
 1. Main Project Deployment
 2. Safe-Net Evolution Scenario

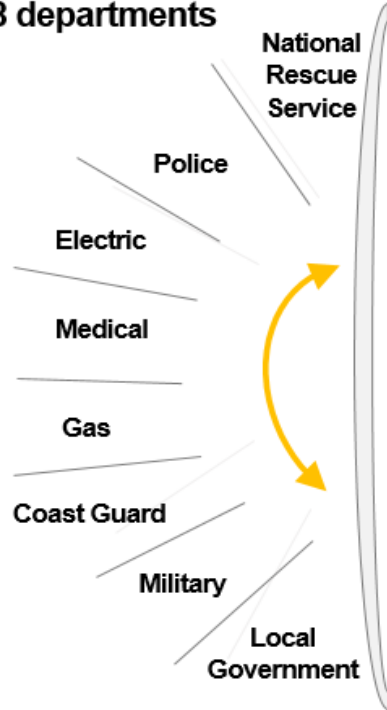
Korean MOIS presentation (3/18)

I. Korea Safe-Net Status

Korean MOIS presentation (4/18)

01 Concept of Korea Safe-Net

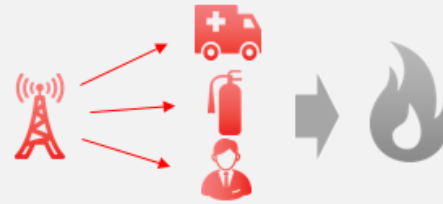
8 departments



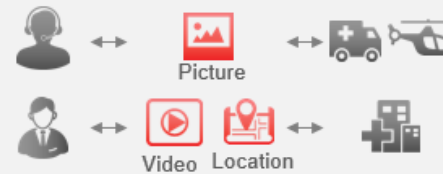
Nationwide
Unified PS-LTE Network

Integrated
Command & Control

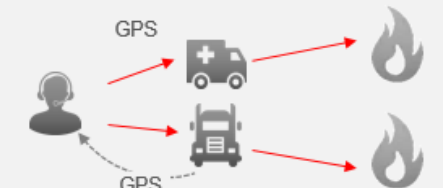
Unified Broadcast Call & Quick Response



PS-LTE based Multiple Media Communication



GPS based Optimized Resource Allocation



※ PS-LTE(Public Safety – Long Term Evolution)

Korean MOIS presentation (5/18)

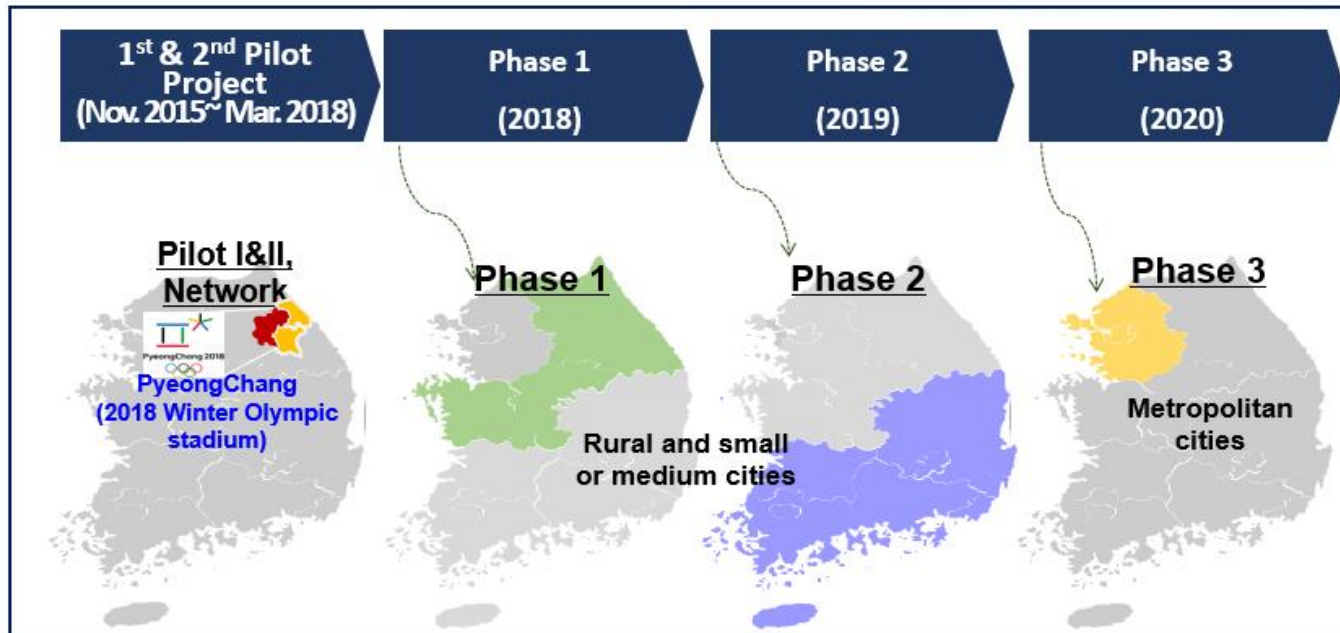
02 Milestone : Progress and Planning



Korean MOIS presentation (6/18)

03 Deployment plan (by phase)

- ▣ Pilot I&II : Verifying & coverage solutions of PS-LTE technologies
- ▣ Phase 1~3 : National Area Network, 3GPP Rel.13 implementation



Korean MOIS presentation (7/18)

04 Coverage Expansion Solutions

All - 4 - One

National Coverage Strategy with the Purpose and Economy of Disaster Safety Network

⊙ Main means ○ Sub means

Index	National infrastructure	Road	Densely populated area	mountain	Rural region	Indoor/ underground	Marine	Railroad
① Fixed BS	⊙	⊙	⊙	○	○	○		
② Commercial networks		○		○	⊙	⊙		
③ Mobile BS				⊙	○	○	⊙	
④ Other networks				○ (LTE-M)	○ (LTE-R)	○ (U/VHF, TRS, LTE-R, SAT)	○ (LTE-M)	⊙ (LTE-R, TRS)

Detailed explanation

- Fixed Base Station : Macro RAN (DU, RU)
- Commercial Network : LTE Network of Telecommunication Operator
- Mobile Base Station : Installed in vehicles or ships
- Other Networks : Interworking of LTE-Railway and LTE-Maritime, Using TETRA, UHF, VHF, etc.

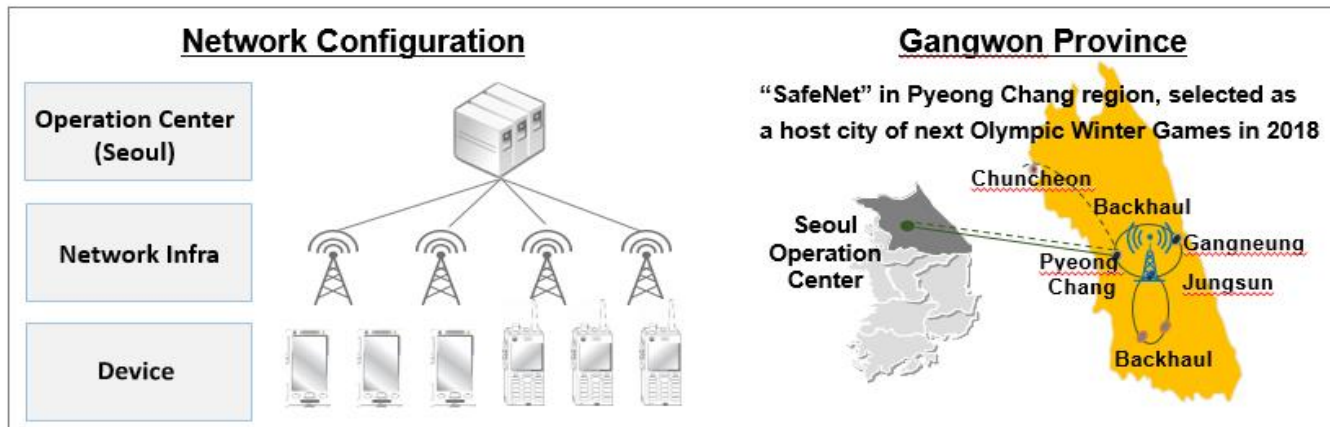
Korean MOIS presentation (8/18)

II. Pilot Project (1st & 2nd)

Korean MOIS presentation (9/18)

01 1st Pilot Project

- **Period:** Nov.2015 - Jun. 2016 (7 months)
- **Area:** PyeongChang, GangNeung, JeongSeon
- **Budget :** 34.5Bil.KRW (32Mil.US\$)
- **Working scope**
 - Operation Center(1), Fixed Base Station(220), Mobile Base station(1), Wireless Phone(2,496)



Korean MOIS presentation (10/18)

02 2nd Pilot Project

- **Period:** OCT. 2017 - Mar. 2018 (6 months)
- **Area:** PyeongChang Olympic regions, etc.
- **Budget :** 5.2Bil.KRW (4.8Mil.US\$)
- **Working scope**
 - 1st Pilot Coverage Expansion
 - Olympic & Paralympic Support

2018 PyeongChang Olympic & Paralympic

- **Games Period**
 - Olympic : 9 - 25 February (17 days)
 - Paralympic : 9 - 18 March (10 days)
- **Location**
 - Pyeongchang / Gangneung / Jeongseon



Korean MOIS presentation (11/18)

03 2nd Pilot Project Goal

Reinforce 1st Pilot and interwork with commercial network

Successful Olympic & Paralympic support

Establish national consensus on disaster safety network project



Establishing the foundation for the nationwide project

Seamless service in Olympic area (Stadium, Main transport Route)



High quality commercial LTE interworking (Minimize shaded areas)



Build optimized Infrastructure (Operational system, terminal)



Advanced application services



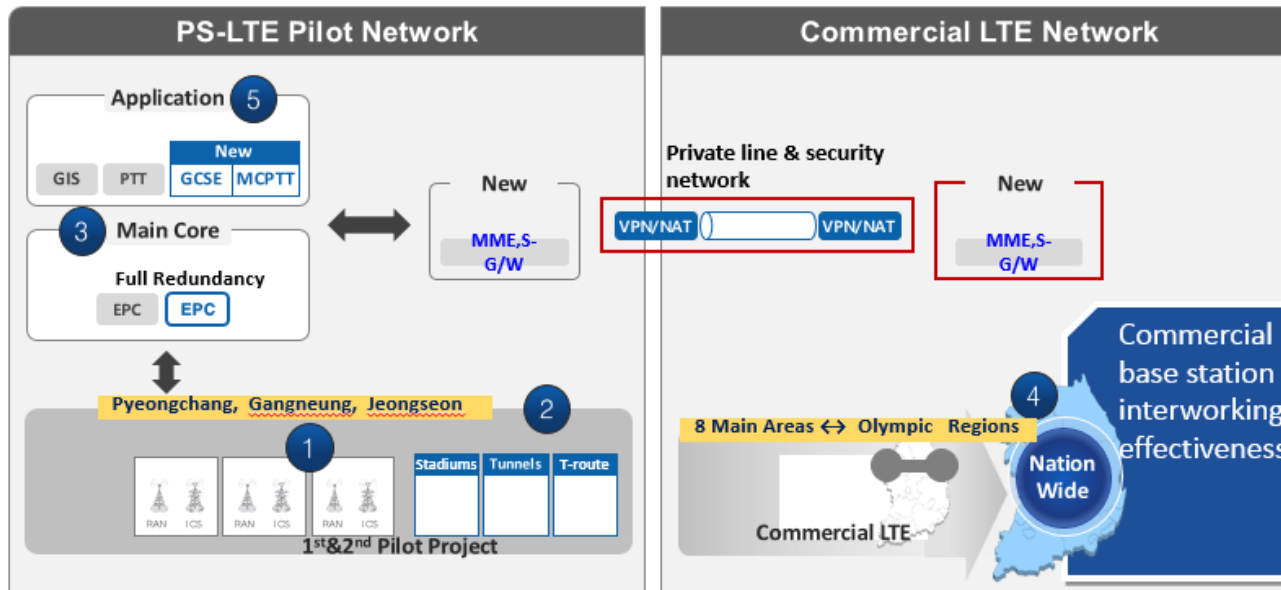
2018 Successful Olympic support



Korean MOIS presentation (12/18)

04 2nd Pilot Project Strategy

- 1 Pilot Network Vulnerability Analysis
- 2 Coverage expansion in core areas
- 3 Full redundancy through multiplexing of main control equip.
- 4 Provide the highest quality commercial LTE network
- 5 Implement differentiated application services



Korean MOIS presentation (13/18)

05 2nd Pilot Project Main Works(1)

1st Pilot Coverage Expansion (Oct. 2017 ~ Dec.)

Radio facilities Reinforcement

Additional Installations

	<u>Pyeongchang</u>	<u>Gangneung</u>	<u>Jeongseon</u>	Etc.	Total
RU	24	9	8	2	43
ICS	2	2	2	-	6
RF	3	3	-	-	6
Total	29	14	10	2	55

Key spots Quality Improvement



< RU Installed >

- Skating Stadium(I/O)

< RF Installed >

- Olympic Organizing Committee
- Gangwon Situation Room

Interworking with commercial networks in major transportation routes



- Using 'RAN Sharing' Technology

Korean MOIS presentation (14/18)

05 2nd Pilot Project Main Works(2)

Olympic & Paralympic Support (Jan. 2018 ~ Mar.)

Supplied and re-arranged PS-LTE device to organizations

Organizations	devices
Total	2,496
Gangwon(L.G.)	449
O.O.C.	274
National Rescue Service	544
Police	607
Coast Guard	424
Military	100
Electric	68
Gas	4
Medical	26

Trained organizations in how to use PS-LTE system

PTT Group System	
Main Group	Every organization
Sub Group	Each organization

Type of devices	
	
Walky-Talky	Smart Phone

Supported organizations to operate PS-LTE Communication System

- Communication System Support
- Run Field Operation Center and vehicle B.S., etc.
 - Each organization used PS-LTE system to do their duties.



Korean MOIS presentation (15/18)

III. Future Plan

Korean MOIS presentation (16/18)

01 Main Project Deployment

Phase 1 ('18)

Phase 2 ('19)

Phase 3 ('20)

Middle Area
(5 Provinces)

- 2 Operation Center Location Selection and Construction
- Fixed Based Station 3,299 Sites Deployment
- Terminals 1,000 units

Southern Area
(9 Provinces)

- 2 Operation Center Core-Network Deployment
- Fixed Based Station 6,936 Sites Deployment
- Terminals 37,000 Units

Seoul, GyeongGi & Incheon
(Metropolitan cites)

- 1,2 Operation Center inter – backup
- Fixed Based Station 4,992 Sites Deployment
- Terminals 81,000 Units

Korean MOIS presentation (17/18)

02 Safe-Net Evolution Scenario

Short term (~ 2020)

Mid term (~ 2022)

Long term (~ 2026)

Public Safety Network Completion

- Terrestrial Coverage
- Coastal ~ 20km

- LBS
- Device Remote Control

Expansion (Military, Organization)

- LTE-R/LTE-M Interworking
- Coastal ~ 100km

- IoT
- u-Health,
- Drone/UAV

Expansion (Mobile Government)

- Expansion to Aeronautic Area

- m-Workspace,
- Robotics,
- Wearable devices

Korean MOIS presentation (18/18)



THANK YOU

Appendix: Safe-Net Forum

Introduction to Korea Safe-Net Forum



1 Introduction to Korea Safe-Net Forum



SafeNet Forum is

the organization established to **reflect the opinions of disaster management and telecommunications experts, industries and operating agencies** to the implementation and operation of PS-LTE, LTE-R and LTE-M. The forum is operated for the purpose of **maintaining the fairness and transparency of the government's policies** related to the nationwide construction of Public Safety Network.

Steering Committee >

Steering Committee deliberates, votes and executes the matters necessary for the operation of the forum.



Expert Committee >

Expert Committee suggests the strategy and study relevant technology / standardization required for the implementation and operation of Public Safety Network.



Industry Committee >

Industry Committee nurtures the relevant industry and increases the global competitiveness of domestic companies to promote overseas ventures.

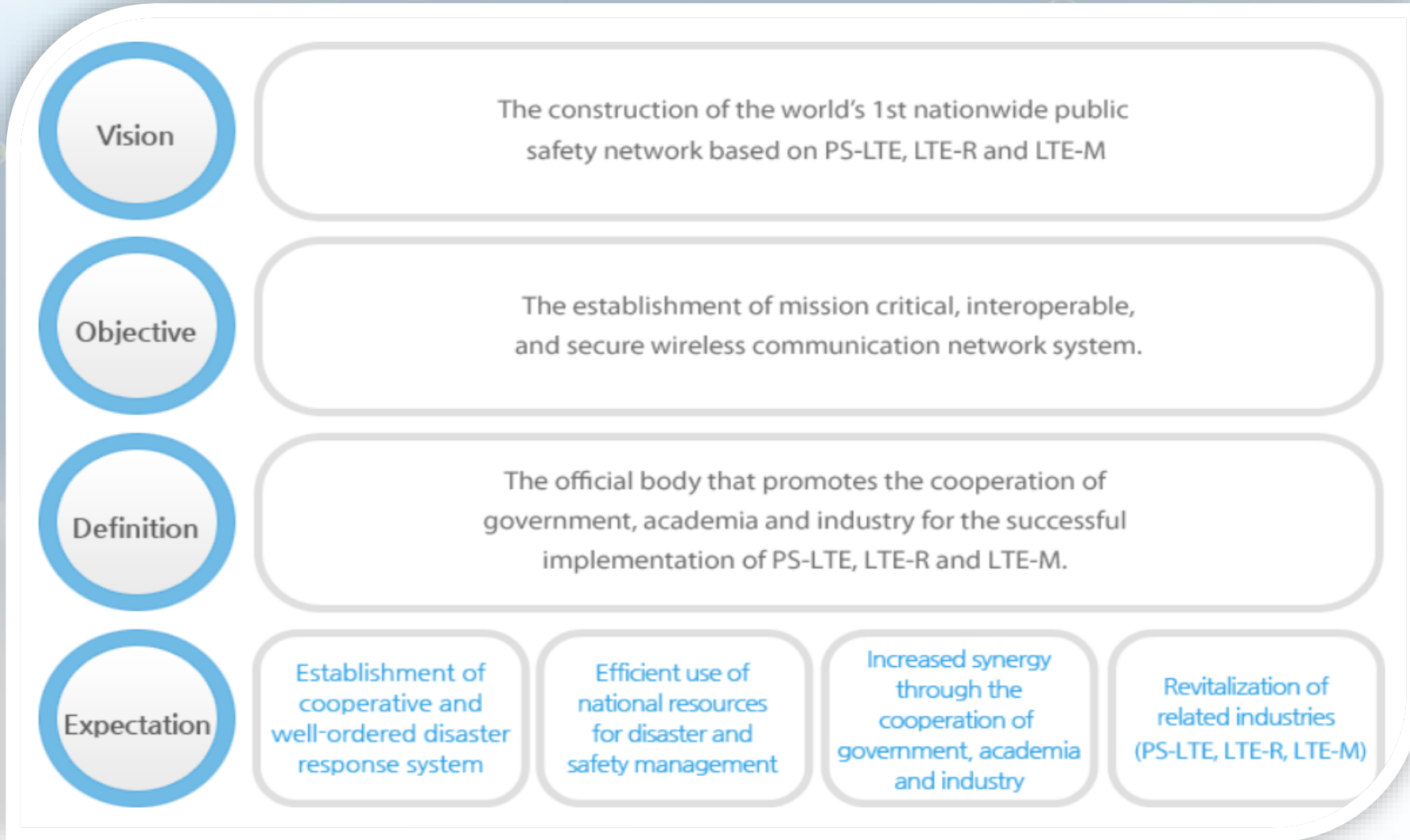


Operating Agency Committee >

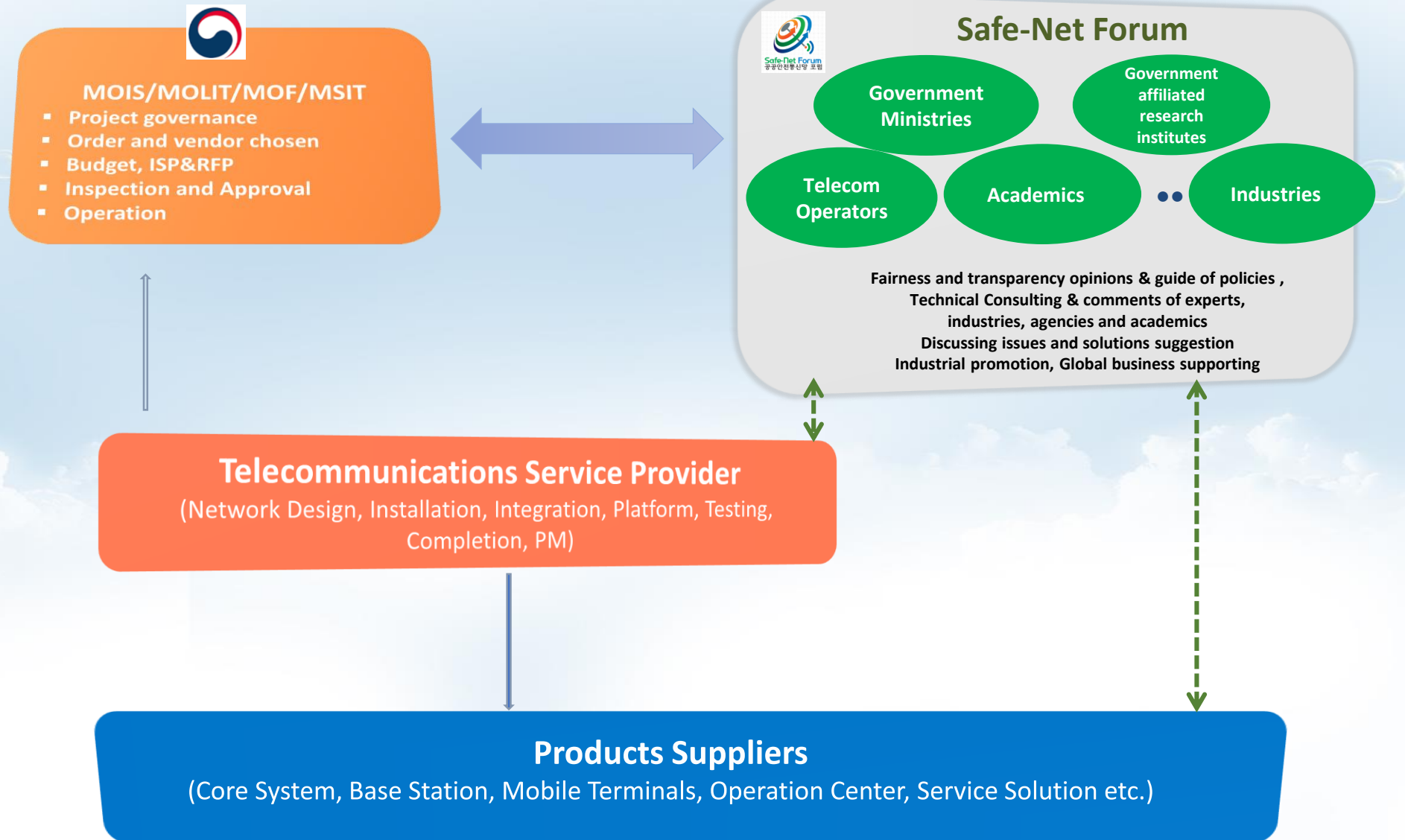
Industry Committee nurtures the relevant industry and increases the global competitiveness of domestic companies to promote overseas ventures.



2 Vision & Objective of Safe-Net Forum



3 Relations of Korean gov. & Safe-Net Forum Stakeholders



4 Safe-Net Forum Members

Government

Telecommunication
Provider

Industries



4 Ministries
(MOIS, MOLIT
MOF, MSIT)