



Ministry of Science and ICT

Korea's 6G R&D Promotion Strategy

November 2023





Contents

I ▶ Background

II ▶ R&D Direction

III ▶ Focus Areas

IV ▶ Pre-6G Demonstration

V ▶ Expected Effects

I Background: The Importance of Network

Network: Imperative for Economy and Society

Key Infra for Digital Innovation

Foundation for creating new industries, including innovative devices and services



Bastion of Digital Sovereignty

Linchpin of national economic security that determines national economic and communications sovereignty



High-Impact National Strategic Industry

Huge Market

Global Equipment Market (USD 1b)

High Growth Potential

[2020]
1,430

[2025]
1,688

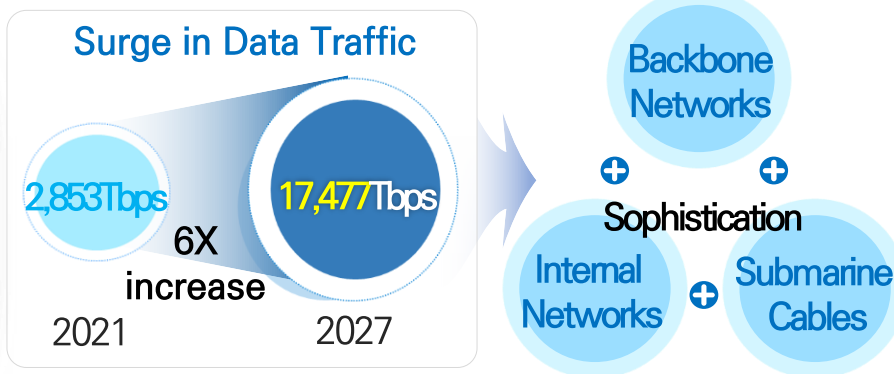
* Gartner, 21.9

Amplification of the Network's Role in Backing Digital Innovation

Advent of Innovative Services and Devices

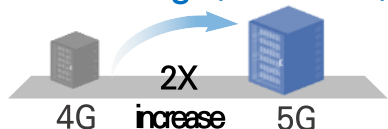


Enhancement of Network Sophistication



Emergence of Energy and Security Concerns

Power Usage (for same area)



✓ Rise in Energy Consumption of Network Equipment

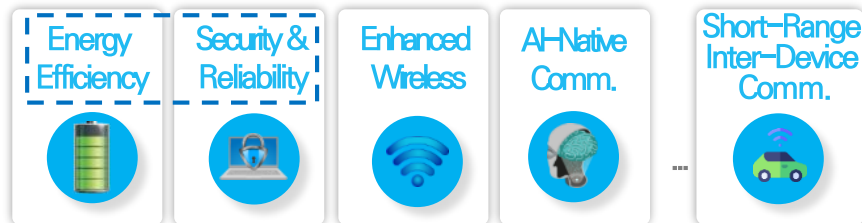


✓ Sophistication of Security Threats

Demand for Advanced Network Technologies

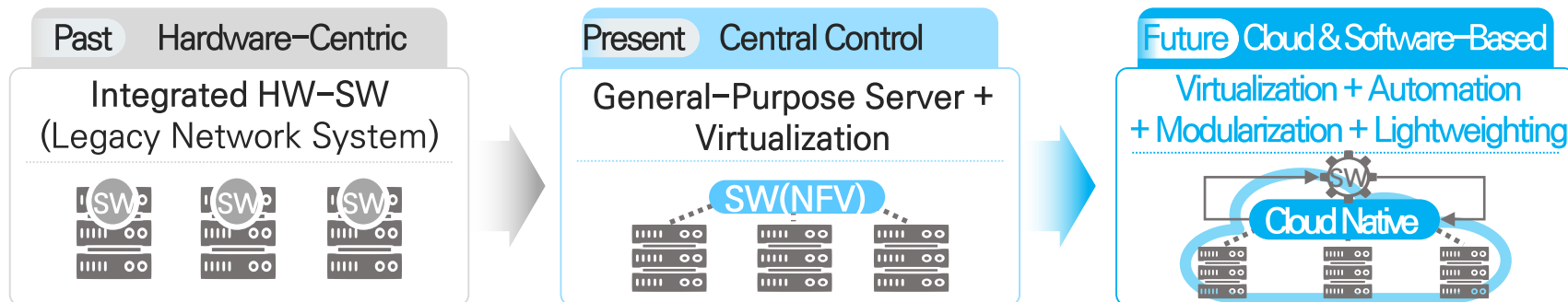


Top 10 Future Tech Areas

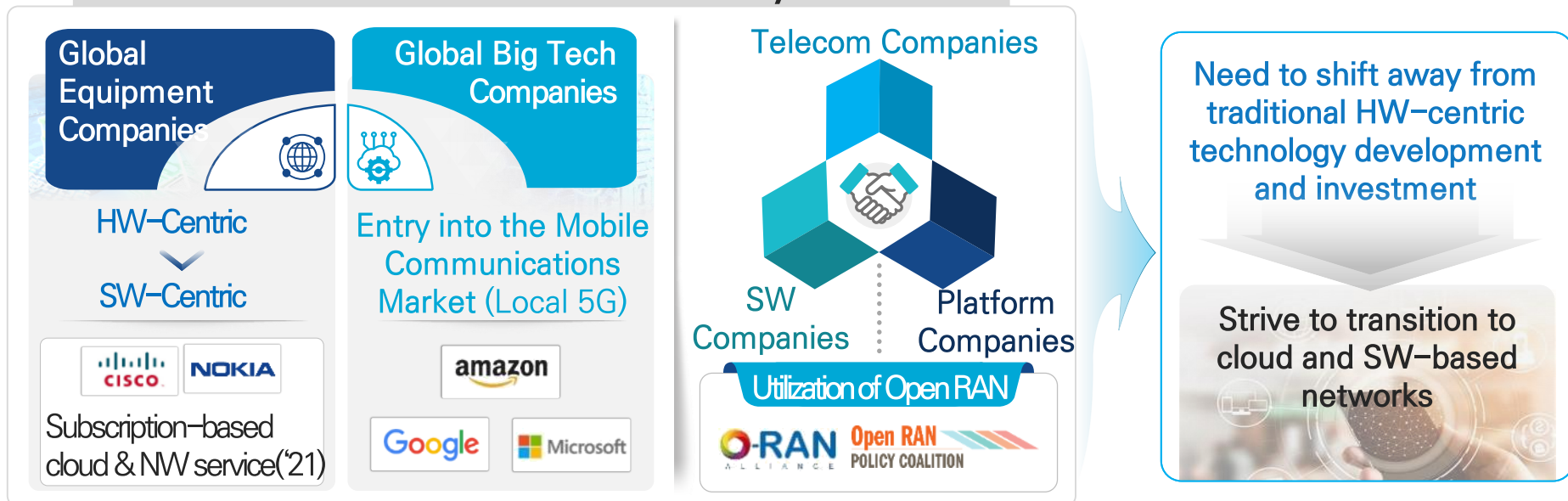


Rapid Paradigm Shift to Cloud & Software-Centric Networks

→ Urgent Preparation Required in the Industry



Arrival of a New Industrial Ecosystem



I Background: Evolving Landscape

“Securing cutting-edge network technology will determine the outcome of the competition.”

Struggle for Dominance Reshaping the Future Industrial Landscape

Securing Domestic Supply Chains



Establishment of Communications Sovereignty

More Prominent Technology Blocs

Cooperation on cutting-edge tech among allies



Expanding the scope of economic security cooperation



Intense Competition for Network Leadership

✓ Major countries are ramping up infra and R&D investments.



Endless Frontier Act (Jun. 2021)

Future Networks Act (Passed House in Dec. 2021)



New Infrastructure Investment Plan (Mar. 2020)

7 Infrastructure Tech Innovations (May 2020)



Digital Compass Strategy (Mar. 2021)

EU 6G SNS Program (Jan. 2022)



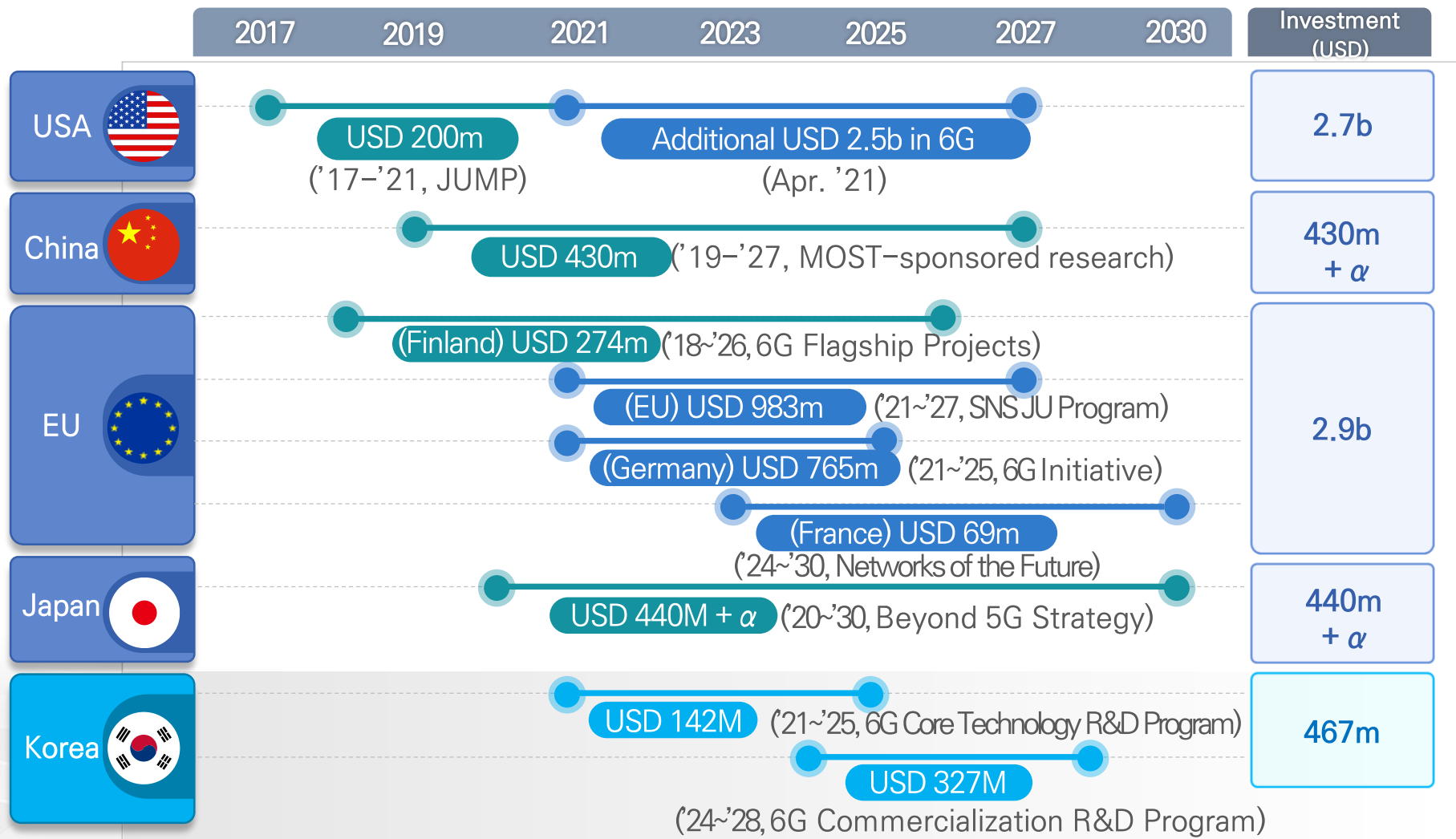
Promotion of international joint research (Apr. 2021)

Expansion of Beyond 5G R&D (Jun. 2021)

A national strategy will be established to respond to the network paradigm shift and global competition, as well as to support the requirements of the deepening digitalization era.

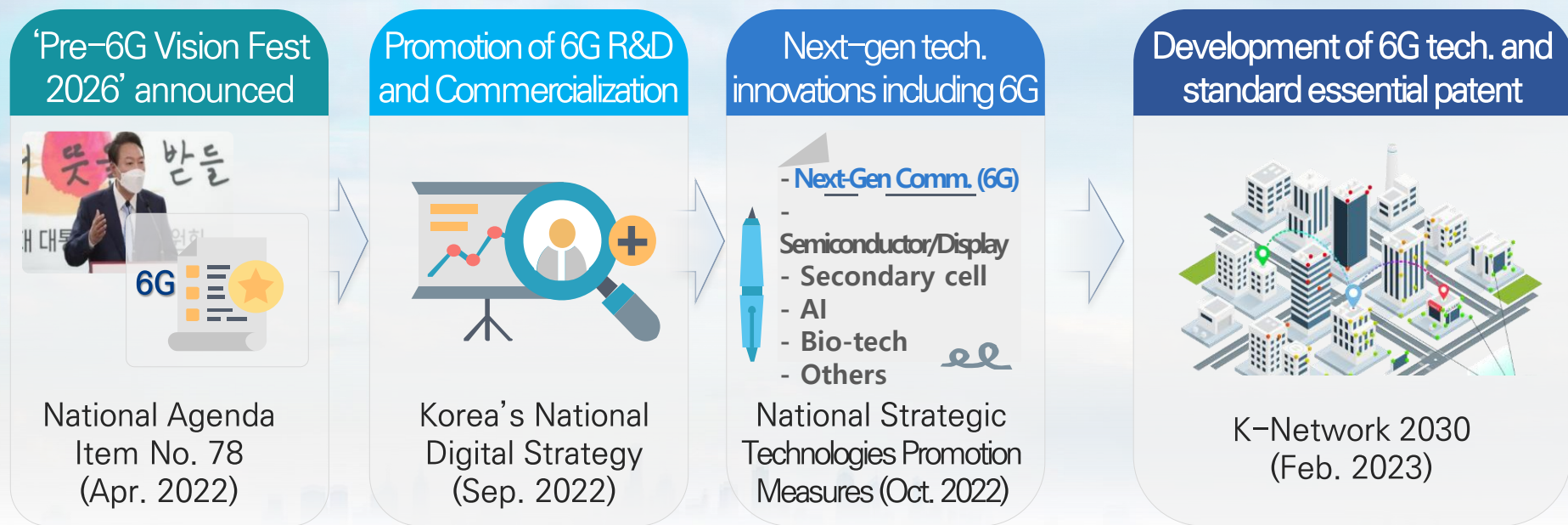
I Background: Global 6G Competition Intensifying

➤ Starting with the U.S.'s proactive investments, nations are competitively pushing for substantial R&D investments to secure pioneering 6G technologies.



I Background: Korea's 6G-Related Policy

➤ The “K-Network 2030” strategy highlights the importance of and support for 6G development for **securing future network leadership**.



6G Core Technology R&D Program('21~'25)

New Program for 6G Commercialization Technology R&D('24~'28)

Comprehensive network innovation from technology and infrastructure to ecosystem

World-Leading Technology

Securing 6G standards & patents
Pre-6G demonstration in 2026

SW-Based Networks Innovation

Fostering small giants in Open RAN & SW-based networks

Strengthened Supply Chain

Securing independent technology for key components of 6G, satellite, quantum, and backbone networks

✓ 6G

- ✓ Quantum Communication
- ✓ Satellite Communication

Innovating Next-Gen Network

Building Industrial Ecosystem

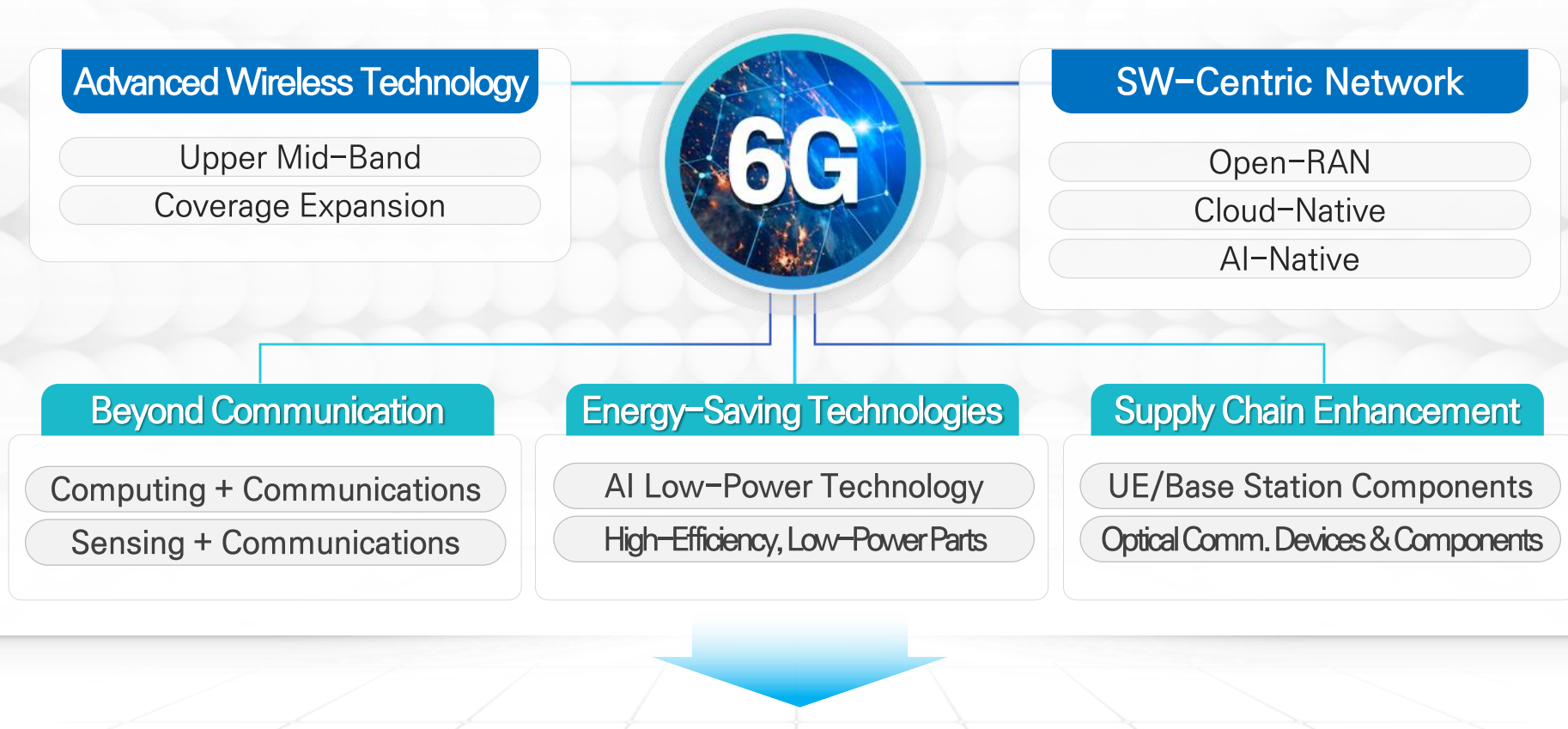
- ✓ Cloud/SW Transition
- ✓ Supply Chain Enhancement
- ✓ Talent Cultivation

Strengthening Network Infrastructure

- ✓ Security & Reliability
- ✓ Local Networks
- ✓ Advanced Core Networks
- ✓ Sustainability

II 6G R&D Direction

- Developing 6G innovative technologies that overcome the limitations of 5G and reflect the SW-centric future technology trends



6G Commercialization Technology R&D Program newly launched (USD 327m, 2024–2028)

II 6G R&D Direction

- Promoting the development and standardization of **13 strategic tech.** across **5 major sectors**, aiming to make **a pre-6G demonstration by 2026.**

Overview of 6G Commercialization Technology R&D Program

Duration 2024 – 2028 (5 years)

Budget KRW 440.7b
– Government: 373.2b
– Private Funding: 67.5b

'24

Standardi-
zation

'26

Pre-6G
Demonstration

'28-'30

Commercial-
ization

5 Major Sectors

01
6G Wireless

02
6G Mobile
Core Network

03
6G Wired
Network

04
6G System

05
6G
Standardization

13 Strategic Technologies

- ① E-MIMO systems
- ② E-MIMO base station component
- ③ 6G upper mid-band terminal component
- ④ 6G coverage expansion
- ⑤ mobile core network architecture and framework
- ⑥ AI-Native mobile core network automation/optimization
- ⑦ 6G fronthaul optical link and transmission system
- ⑧ Integrated wireless and wired optical system
- ⑨ 6G networking transmission component
- ⑩ end-to-end service performance assurance framework
- ⑪ 6G system technology supporting AI-Native application services
- ⑫ 6G open service verification platform
- ⑬ 6G standardization



Low power
consumption

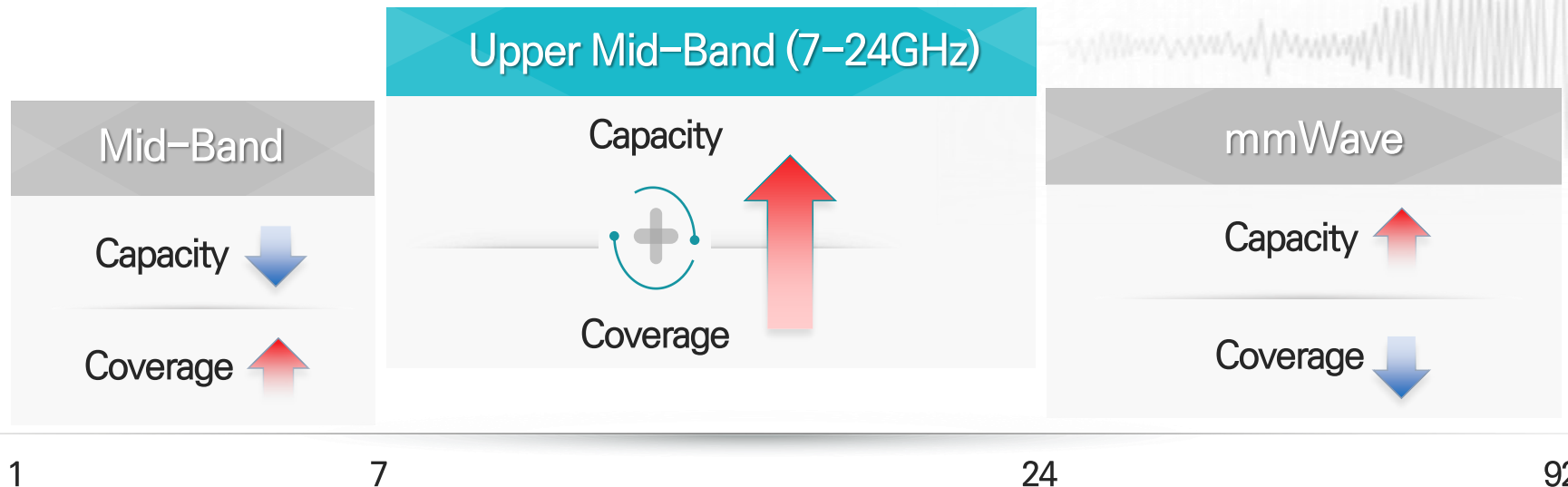


Security



Reliability

- Developing **high-capacity, high-coverage communication technology** based on the upper mid-band (7–24GHz).



Strategic Technologies

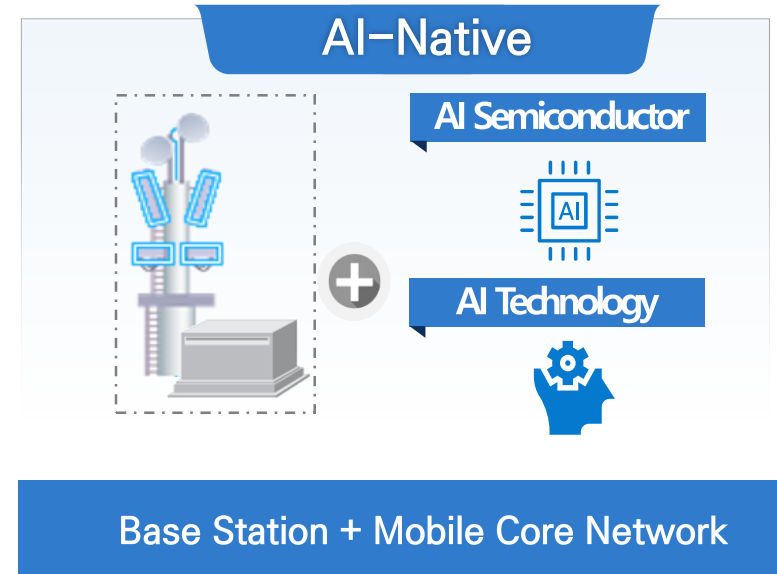
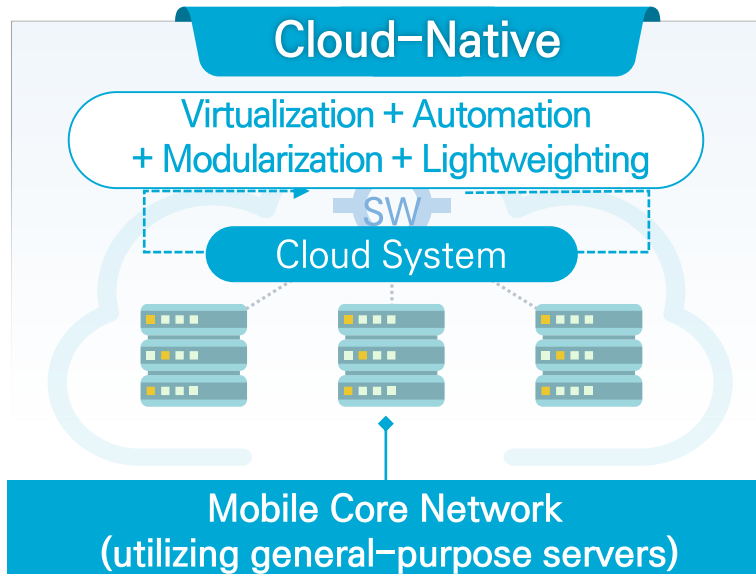
① E-MIMO Systems

② E-MIMO Base Station Components

③ Components for Terminals

④ Coverage Expansion Technology

- Developing **cloud-native core network** technology, along with **AI-native mobile networking technology** for **quality assurance of services**



Strategic Technologies

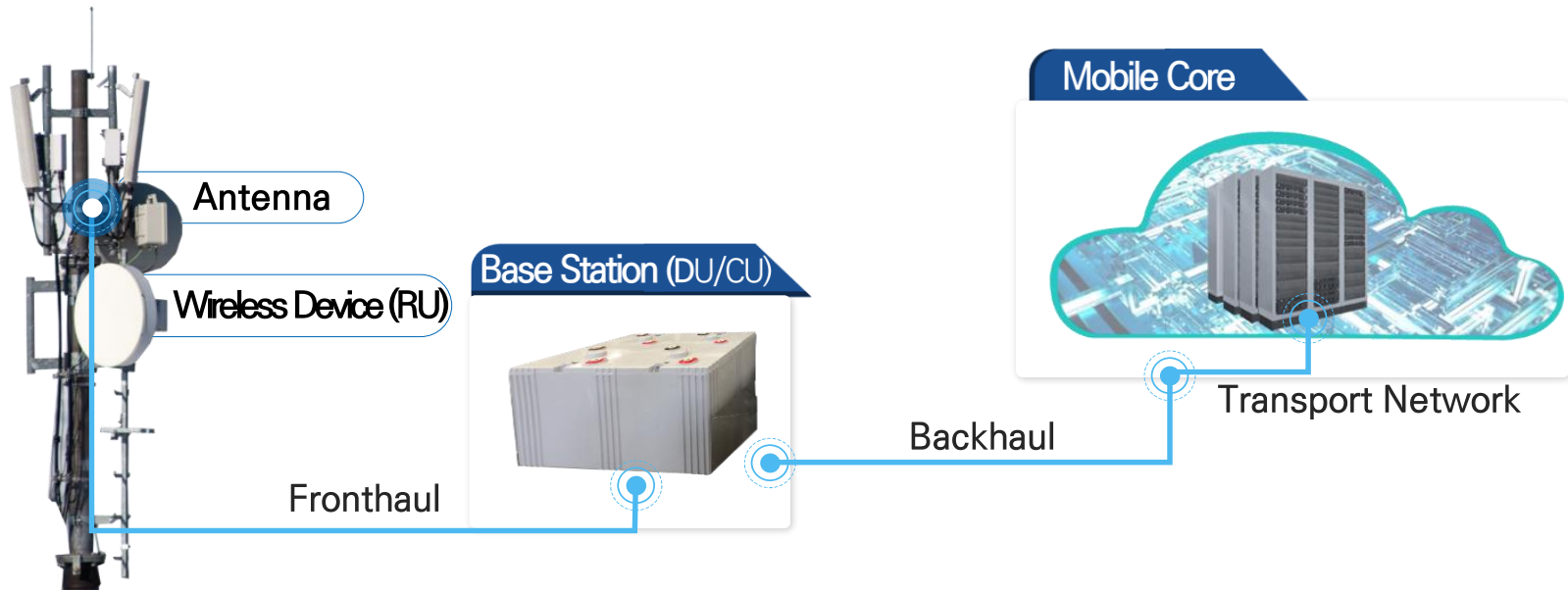


⑤ Mobile Core Network Architecture and Framework

⑥ AI-Native 6G Mobile Core Network Automation & Optimization



- Developing **ultra-high-speed, high-capacity optical transmission system and component technology** for the 6G fronthaul-backhaul



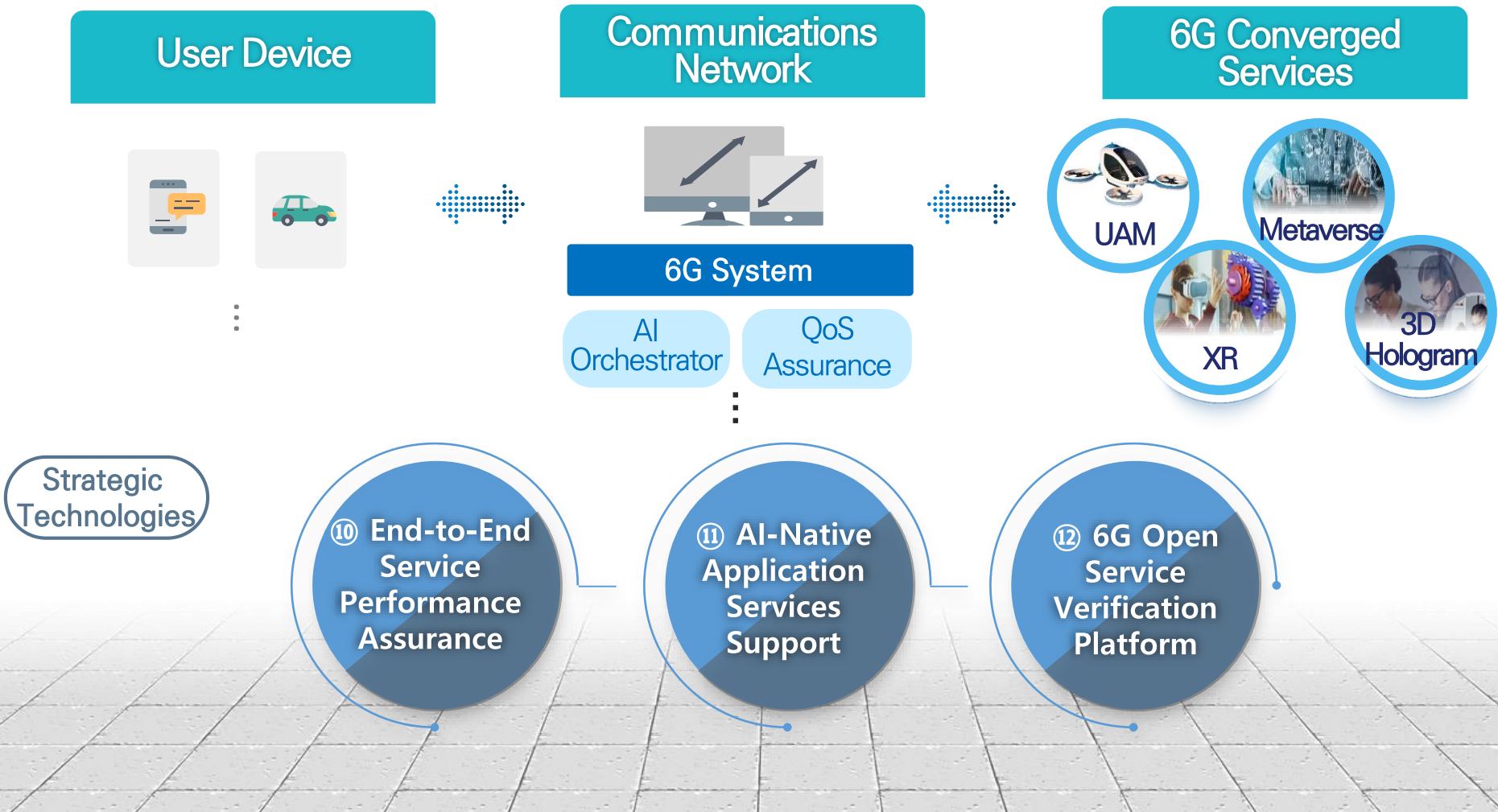
Strategic
Technologies

⑦ 6G Fronthaul
Optical Link and
Optical
Transmission
System

⑧ Integrated
Wireless and
Wired Optical
Access System &
Components

⑨ 6G
Networking
Transmission
Equipment and
Components

- Developing **wireless and wired resource orchestration technology and AI-native application service operating system** to ensure diverse composite QoS performance for 6G converged services



- Operating a dedicated research support system for the development of **6G standard technologies**; **support for standardization activities**; and **training of standardization experts**

'23



Announcement of
6G Vision

(WRC-23)
Discussion of
Frequency

'24~'25



Development of
Standards
launched

'26~'27



Standardization
Completion
Commercialization
Development

'28~'30



6G
Commercialization

Support for Standards Development and Standardization Activities

Strategic
Technologies



⑬ Support
for 6G
Standardization



- **Demonstration of Pre-6G technology in 2026,**
leveraging advanced technological innovations and
large-scale public-private joint investments in 6G research



Project
Outcomes
2028

Short-Term
Effects
-2030

Long-Term
Effects
2031-

Technology & Market

Preemptively securing commercialization technology for the entire life cycle of 6G

Securing global 6G technological dominance

Leaping to a telecom powerhouse

Standardization

Preempting 6G standards

Achieving the No. 1 share in global 6G standards

Creating added value of USD 133b (in royalties, etc.)

Supply Chain

Ensuring component / equipment availability between demand and supply companies

Promoting the mutual growth of large and small enterprises while establishing a stable supply chain

Thank you!

