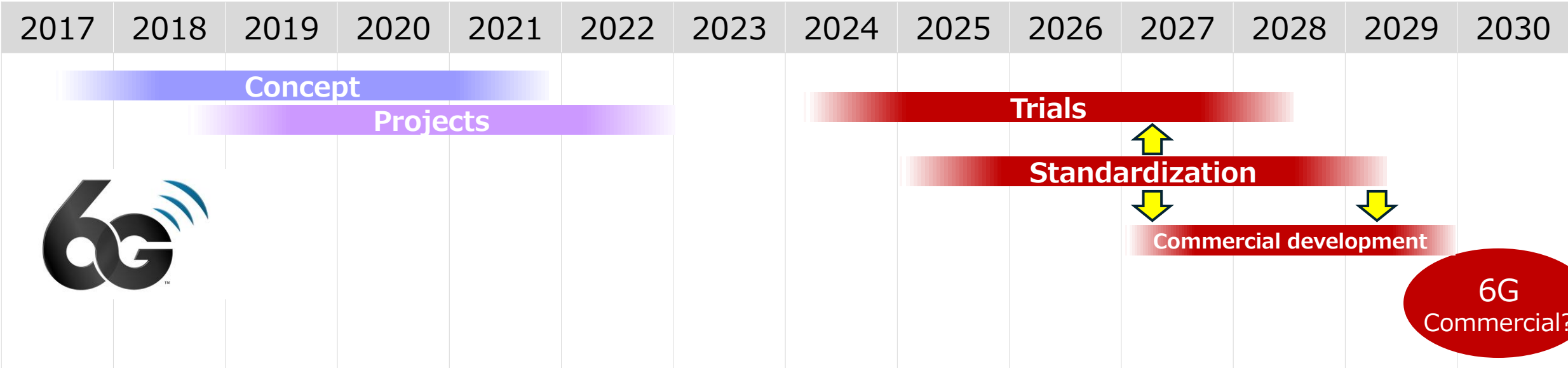
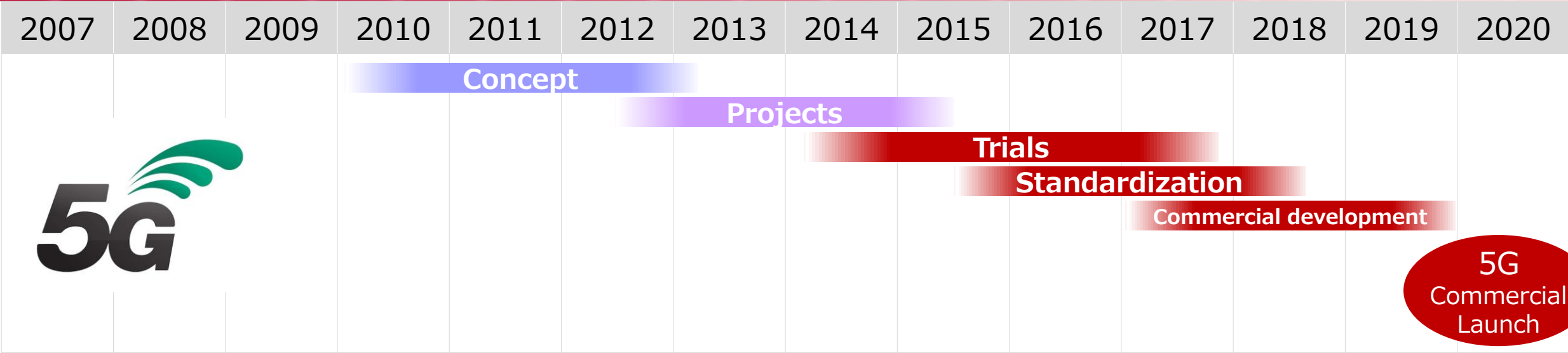


6G Values and Technologies

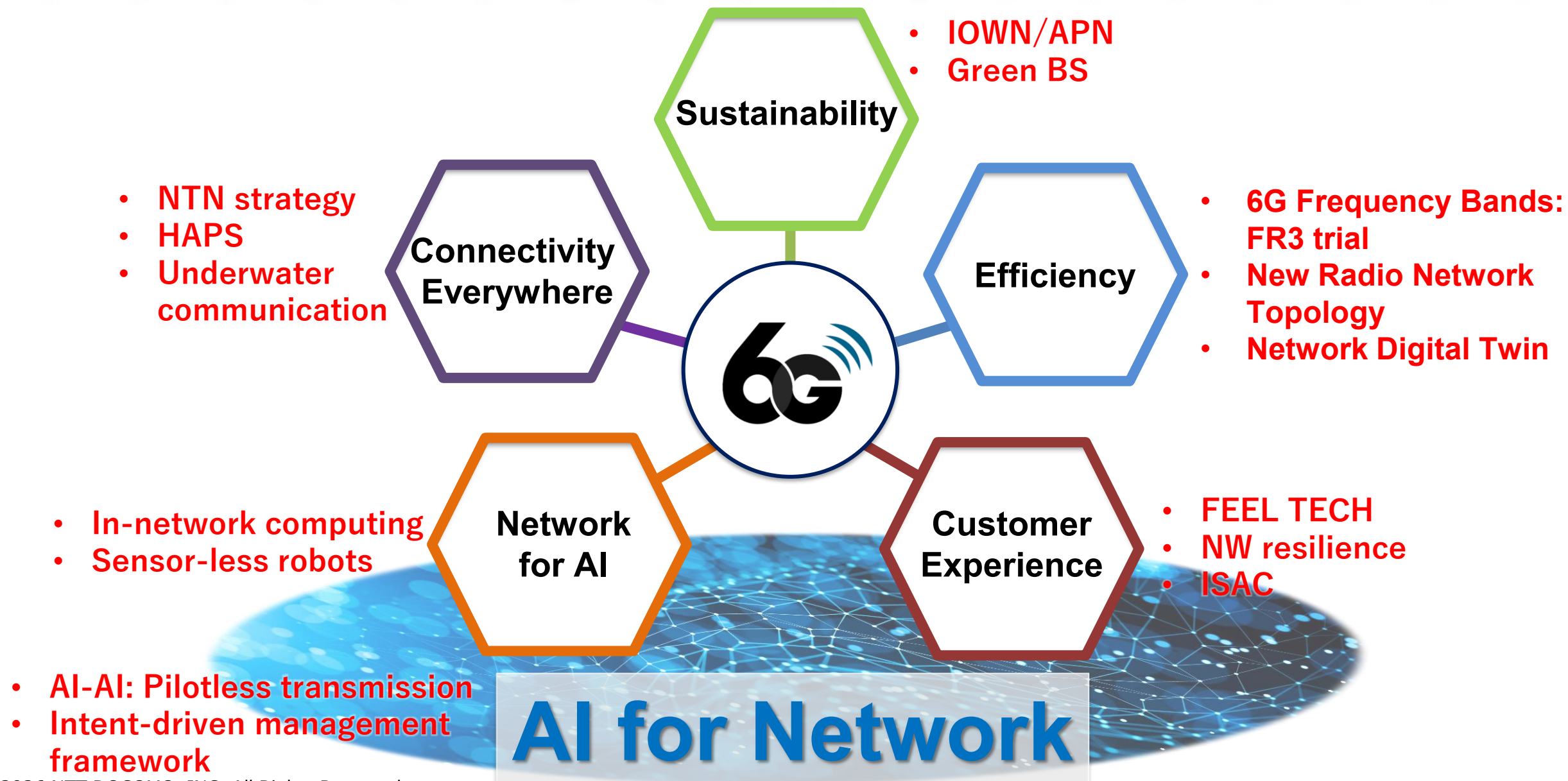
Takehiro Nakamura

Chief Standardization Officer and Corporate Evangelist
NTT DOCOMO, Inc.

History of 5G Development and 6G Roadmap



Values of 6G and DOCOMO's Initiatives



Why 6G?

Aug 2026

XG Mobile Promotion Forum

- What is 6G?
 - What is 6G?
 - 6G use cases
 - How 6G differs from 5G
- Why is 6G needed?
 - Social infrastructure for growth
 - Ever-growing traffic demand
 - Growing UL data traffic
 - Benefits of investing in 6G
- What is needed to realize 6G?
 - 6G spectrum
 - Monetization: importance and clear logic
 - Sustainable infrastructure build and operations

What is 6G?

What is 6G? — Connecting people, things & AI

1 Core technology for AI-native* digital infrastructure

AI | Digital Twin | Robotics | Space Networks

Network architecture with distributed computing

A “nervous system” connecting computing resources across clouds and devices

Physical AI & Agentic AI

Radio interface & Network operations

AI-native design from Day 1

2 Global communication network

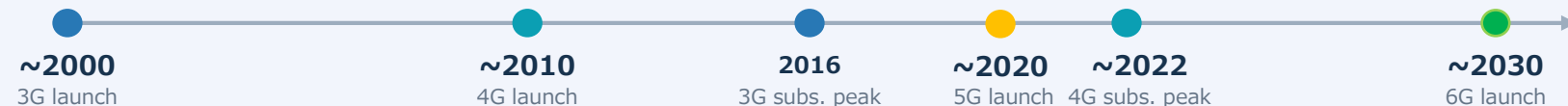
Enabled by NTN, HAPS, etc.

3 Sensing + communication

Enhance situational awareness and infrastructure value

4 Commercial launch around 2030**

Early rollout + Long-term growth

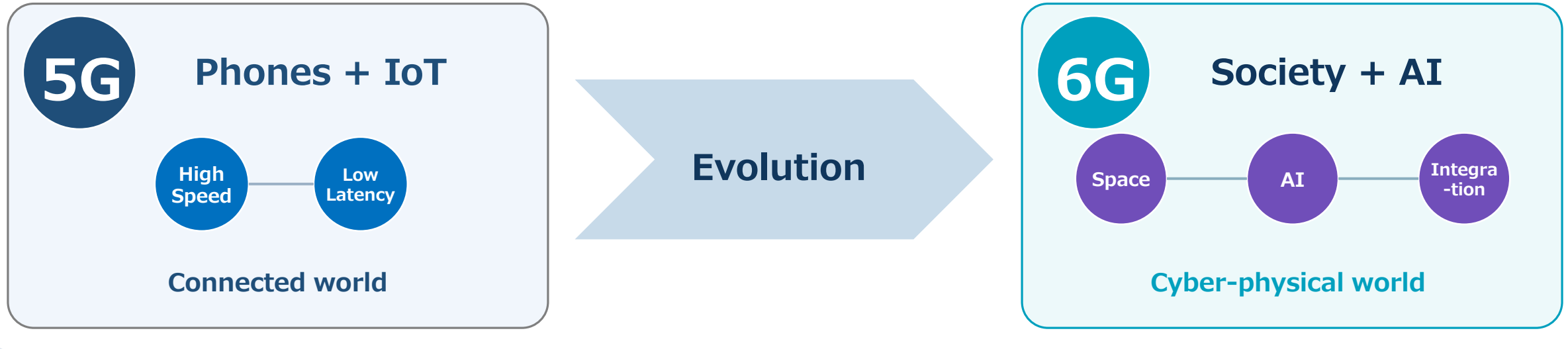


*Note — AI-native: Unlike improving existing systems by adding AI, AI is embedded from the outset in the design and implementation of the overall system, including protocols and operations. See: https://xgmf.jp/pdf/6g-NW-Architecture/20260522_XGMF-AI_r1.pdf

** See Appendix [1] for the 6G timeline

How 6G Differs from 5G

From 5G as connectivity to 6G as digital infrastructure for a smart society



6G integrates new capabilities into the network from Day 1

1 AI-native

Agentic AI & Physical AI

2 Beyond Connectivity

Positioning & Sensing

3 Ubiquitous Connectivity

NTN & HAPS

5G evolution: performance gains

Spectral efficiency | UX | UL/DL | Reliability & resilience | Energy efficiency

ITU-R key metrics: ~1.5–3× improvement* (Appendix [3])

* Source: [Draft new Report ITU-R M.\[IMT-2030.TECH PERF REQ\]](#), 3GPP TR38.914

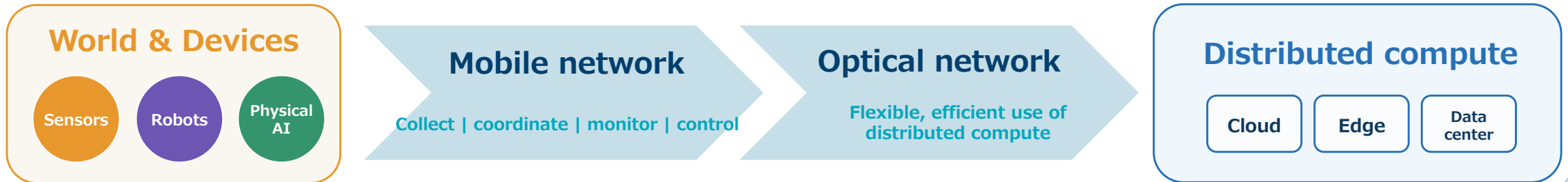
Why is 6G needed?

ICT infrastructure is the “Infrastructure of Infrastructures” supporting all industries
Not a cost — an investment in growth.*

Continuous mobile evolution



Beyond 5G**: Mobile + optical networks link Physical AI to distributed compute



Contributions to Future growth & societal challenges ***

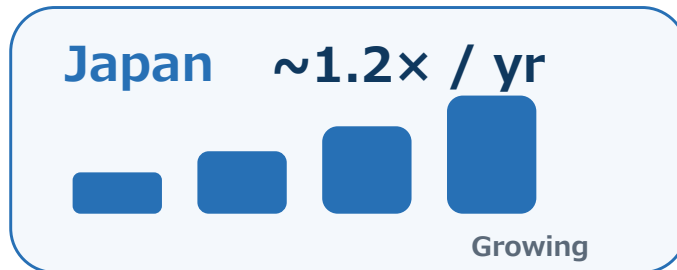
* Source: https://www.soumu.go.jp/main_content/001080983.pdf

** Source: https://www.soumu.go.jp/menu_seisaku/ictseisaku/B5G_sokushin/index.html

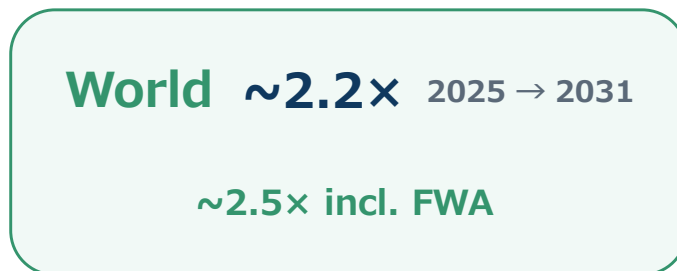
*** Source: <https://xgmf.jp/wp-content/uploads/2025/07/XGMF-6G-Position-Paper-ver1.0.pdf>

6G needed for ever-growing mobile data traffic

Growth of mobile data traffic



Source: MIC ICT Statistics Database
[Data by field: Telecommunications: Traffic](#)



Source: Ericsson Mobility Report 2026

Demand

Actions

- 1 More spectrum**
Meet demand
- 2 Expand network**
Add capacity
- 3 Latest tech**
Improve efficiency

6G

Meet growing traffic demand

Spectrum
+ infrastructure
+ technologies

Efficient network expansion

Total traffic growth



AI-era shift



UL demand



6G needed

AI reshapes UL traffic beyond traditional industrial use ⇒ 6G addresses rising UL demand

Drivers of UL traffic

1 Industry
Video + remote control

2 AI devices
Phones, glasses, vehicles

3 Autonomous agents
AI agents + sensing

4 Physical AI
Network-side compute

UL growth accelerates

Legacy 

AI era 

- At many service providers, UL growth exceeds DL growth
- Scenario: 2031 UL traffic reaches 3× 2025***

Traffic pattern shift

- AI agents and sensing generate continuous, autonomous UL traffic*
- GenAI-enabled IoT sends video streams and sensor data**

6G

Improved UL

Handle UL growth

Support AI apps

Enable Physical AI

* Source: <https://www.qualcomm.com/news/onq/2026/05/6g-foundry-ai-native-platform>

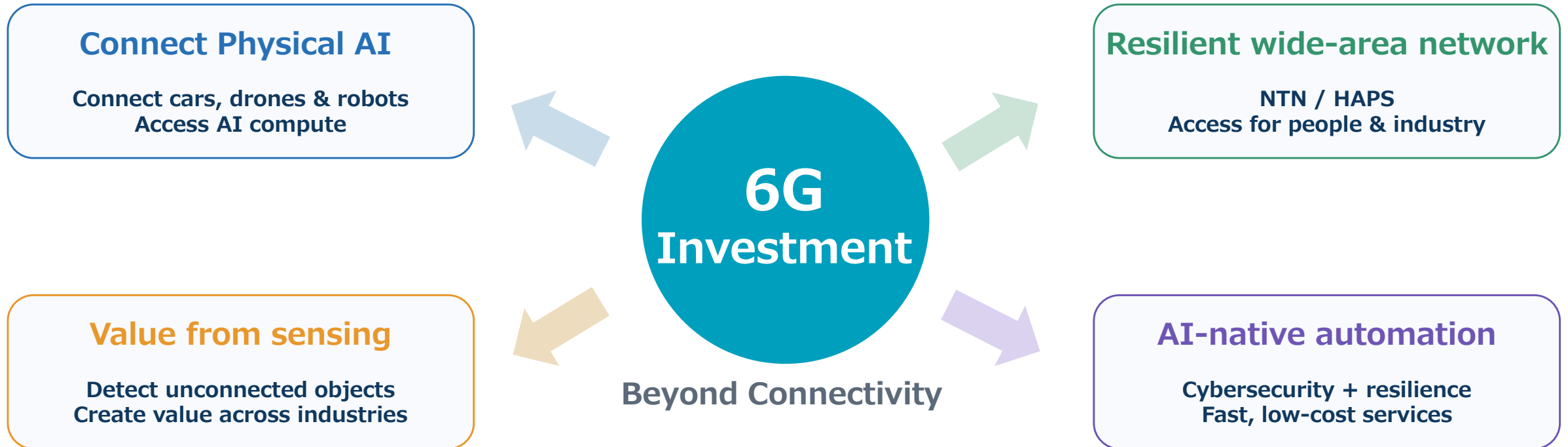
** Source: <https://www.nokia.com/artificial-intelligence/explainer-network-traffic-is-fundamentally-changing-in-the-ai-supercycle/>

*** Source: <https://www.ericsson.com/en/reports-and-papers/mobility-report/articles/rising-uplink-demand-ai-driven-mobile-networks>

Also see: <https://www.ookla.com/articles/benchmarking-5g-ai-workloads-2026> , Appendix [4][5]

Benefits of Investing in 6G

6G investment = Early investment in AI-era industrial infrastructure



Value created

Nation

Growth, not cost*

Telecom

Cost reform + new revenue

Industry

New business & monetization

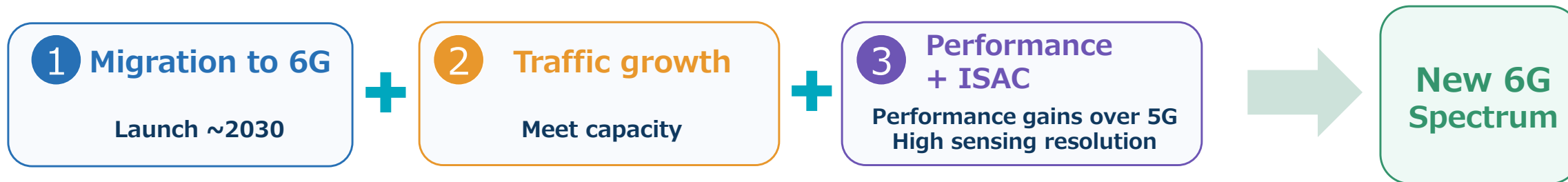
Consumers

Connectivity → Value

* Source: https://www.soumu.go.jp/main_content/001080983.pdf

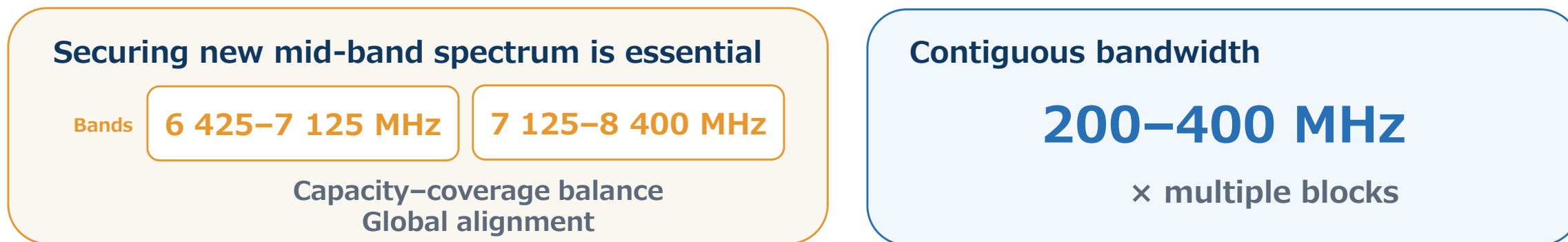
What is needed to realize 6G?

New 6G spectrum is needed for 6G introduction and growing traffic
A roadmap for new mid-band spectrum must be presented early



XGMF Spectrum White Paper

* <https://xgmf.jp/pdf/2025/XGMF-Spectrum-White-Paper-20251208.pdf>

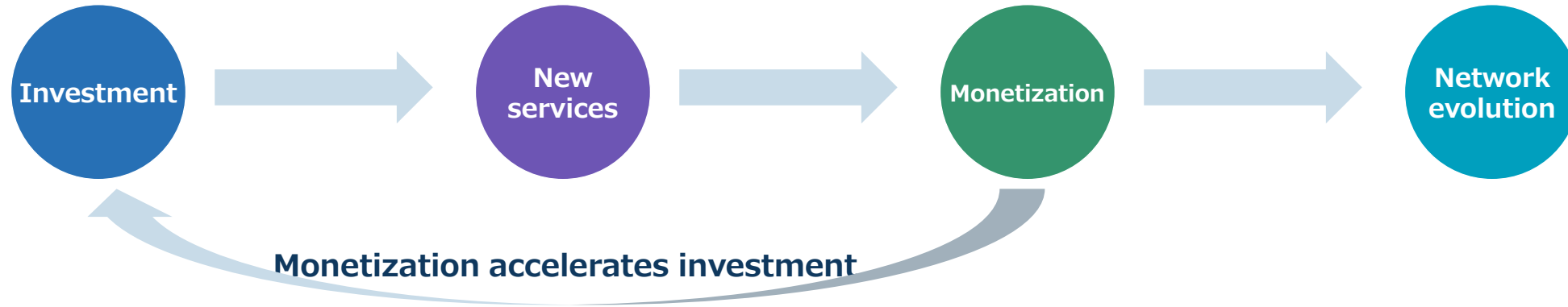


Actions Required

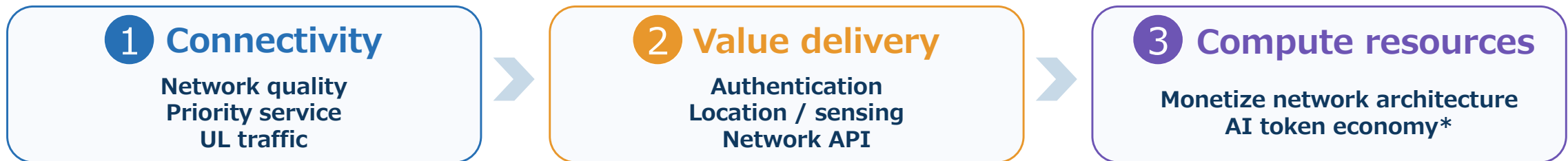


Monetization: Importance & Clear Logic

Build a positive cycle: investment → services → monetization



Network monetization evolution



Build monetization foundations now for smooth 6G rollout & success

* Source: AI token economy

<https://www.gsmainelligence.com/research/telcos-and-the-ai-token-economy-china-sets-the-pace>

Continuous evolution across migration, operations & design/deployment

1 Network Migration

By 6G launch ~2030,
5G should be mostly SA

Keep 4G for some time
Avoid too many systems



2 Network Ops Automation

Operate complex networks

More spectrum, functions & monetization
Meet B2C / B2B / B2G demand fast
Reduce OPEX



3 Network Design & Build

AI-optimized design

Digitalize deployment processes
Improve efficiency & speed
Scenario-based infrastructure sharing



**Sustainable Infrastructure:
Build & Operation**

Limit complexity

Respond fast to demand

Optimize cost & performance