

ITU and International Standardization

Seizo ONOE

**Director of Telecommunication Standardization Bureau (TSB)
International Telecommunication Union (ITU)**

Topics

  **ITU**



  Thought on Standardization

  History of Generations: 1G to 5G

  Future Beyond 6G toward 12G



ITU is global



ITU is the UN specialized agency for ICTs



193

Member states

+800

Companies/ organizations

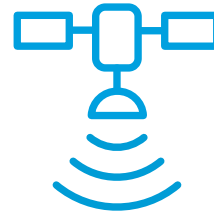
+160

Academia



Who we are

The UN specialized agency for ICT



Radiocommunication

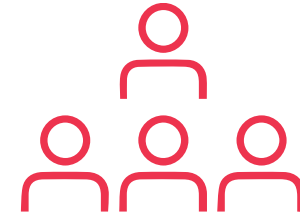


Standardization



Development

ITU-T Study Groups (SG)



[SG2 - Operational aspects](#)



[SG3 - Economic & policy issues](#)



[SG5 – Environment, EMF & circular economy](#)



[SG9 - Broadband cable & TV](#)



[SG11 - Protocols, testing & combating counterfeiting](#)



[SG12 - Performance, QoS & QoE](#)



[SG13 - Future networks](#)



[SG15 - Transport, access & home](#)



[SG16 - Multimedia & digital technologies](#)

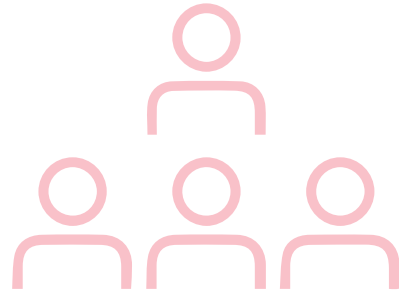


[SG17 - Security](#)



[SG20 - IoT, smart cities & communities](#)

| ITU standardization: Global community



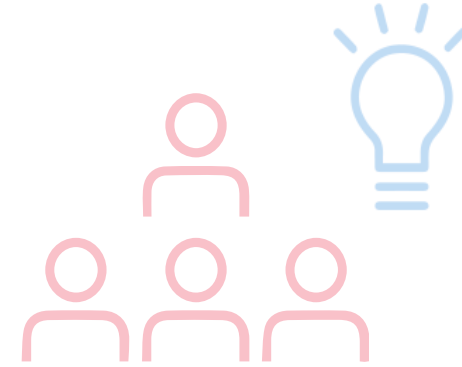
Study Groups

Membership-driven study groups develop international standards



Focus Groups

Open-to-all focus groups define new directions in ITU standardization



Workshops

Open-to-all events analyze emerging trends and encourage peer-learning

| ITU-T Focus Groups



Autonomous Networks
([FG-AN](#))



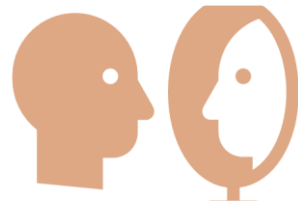
Testbeds Federations for IMT-2020
& beyond
([FG-TBFxG](#))



AI for Health
([FG-AI4H](#))



Costing Models
for Affordable
Data Services
([FG-CD](#))



Metaverse
([FG-MV](#))

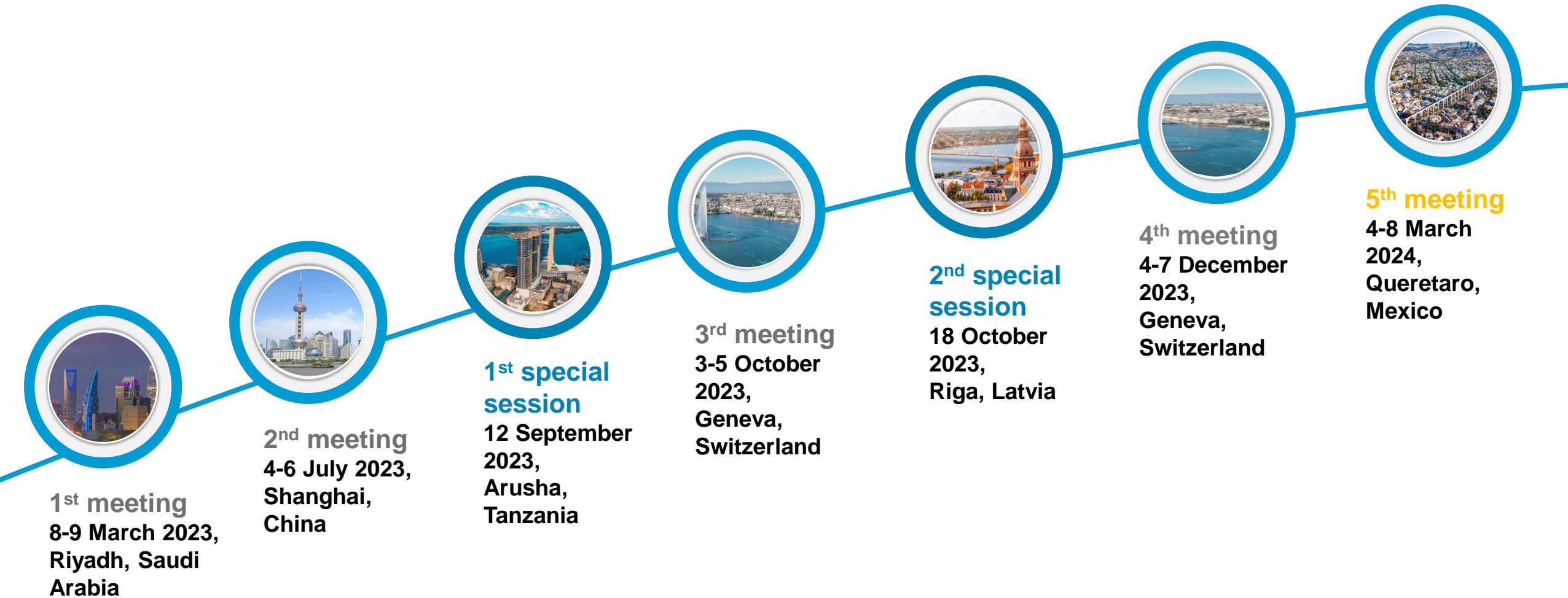


AI for Natural Disaster Management
([FG-AI4NDM](#))



AI & IoT for Agriculture
([FG-AI4A](#))

FG-MV roadmap



ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications	ITU Publications
ITU- (FG-)	ITU (FG-)	ITU F (FG-)	ITU (FG-)	ITU- (FG-)	ITU (FG-)	ITU F (FG-)	ITU (FG-)	ITU (FG-)	ITU (FG-)	ITU (FG-)	ITU Focus Group Technical Specification (FG-MV)
Expl. chall. Work	Met. Work	Guid. accel. devel. Work Includ.	Req. serv. desi. Work Includ.	Expl. chall. Work	Met. Work	Guid. accel. devel. Work Includ.	Req. serv. desi. Work Includ.	Req. serv. desi. Work Includ.	Req. serv. desi. Work Includ.	Req. serv. desi. Work Includ.	FGM-05 Requirements of accessible products and services in the metaverse: Part II – User perspective Working Group 8: Sustainability, Accessibility & Inclusion

22 Approved FG-MV deliverables

Document Type	Title
Technical Report	Exploring the metaverse: opportunities and challenges
Technical Report	Metaverse: an analysis of definitions
Technical Specification	Definition of metaverse
Technical Report	Principles for building concepts and definitions related to metaverse
Technical Report	Power metaverse : Use cases relevant to grid side and user side
Technical Specification	Capabilities and requirements of generative artificial intelligence in metaverse applications and services
Technical Specification	Service scenarios and high-level requirements for metaverse cross-platform interoperability
Technical Report	Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse
Technical Report	Cyber risks, threats, and harms in the metaverse
Technical Report	Embedding safety standards and the user control of Personally Identifiable Information (PII) in the development of the metaverse
Technical Report	Children's age verification in the metaverse
Technical Report	Responsible Use of AI for Child Protection in the metaverse
Technical Report	Policy and regulation opportunities and challenges in the metaverse
Technical Report	Regulatory and economic aspects in the metaverse: Data protection-related
Technical Report	Guidelines to assess inclusion and accessibility in metaverse standard development
Technical Specification	Requirements of accessible products and services in the metaverse: Part I – System design perspective
Technical Specification	Requirements of accessible products and services in the metaverse: Part II – User perspective
Technical Specification	Design criteria and technical requirements for sustainable metaverse ecosystems
Technical Specification	Accessibility requirements for metaverse services supporting IoT
Technical Report	Accessibility in a sustainable metaverse
Technical Report	Guidelines and requirements on interpreting in the metaverse
Technical Report	Guidance on how to build a metaverse for all – Part I: Legal Framework



AI for Good

| AI for Good Global Summit 2023

ITU Events

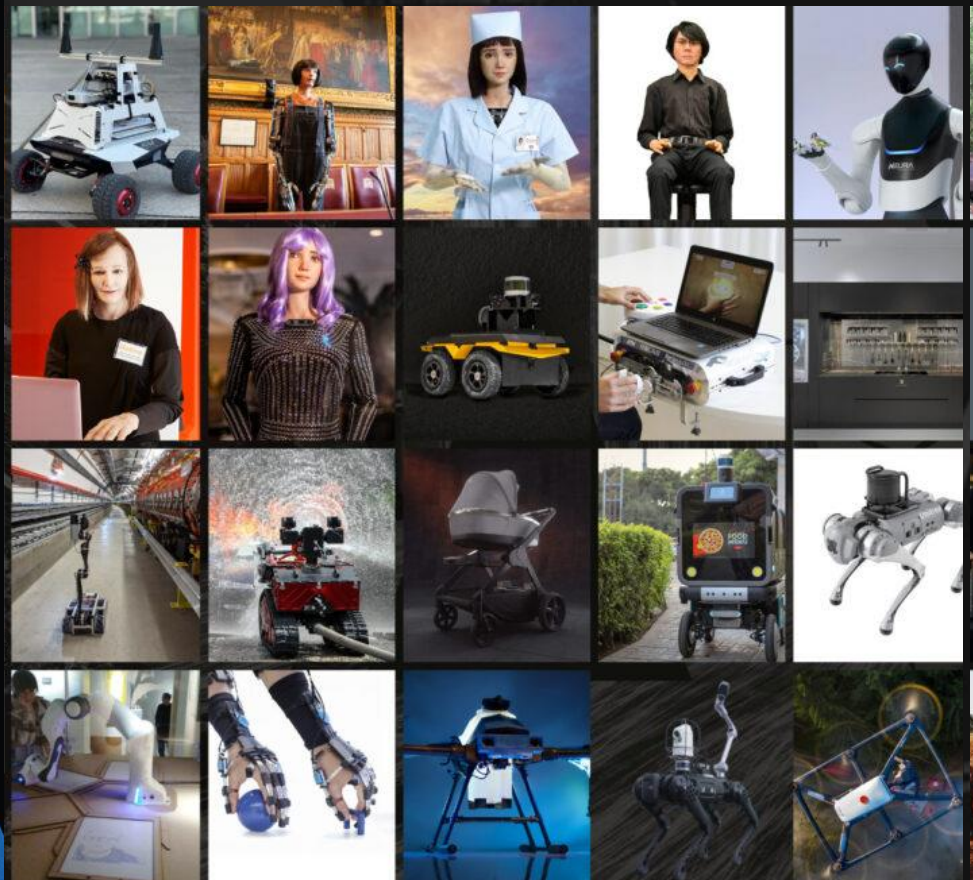


AI for Good Global Summit

*Accelerating the United Nations
Sustainable Development Goals*

6 - 7 July 2023
Geneva, Switzerland

aiforgood.itu.int



40 UN PARTNERS







AI for Good

Global Summit

*Accelerating the United Nations
Sustainable Development Goals*

30-31 May 2024

Geneva, Switzerland

good.itu.int







Setting the standard

Smart cities and communities



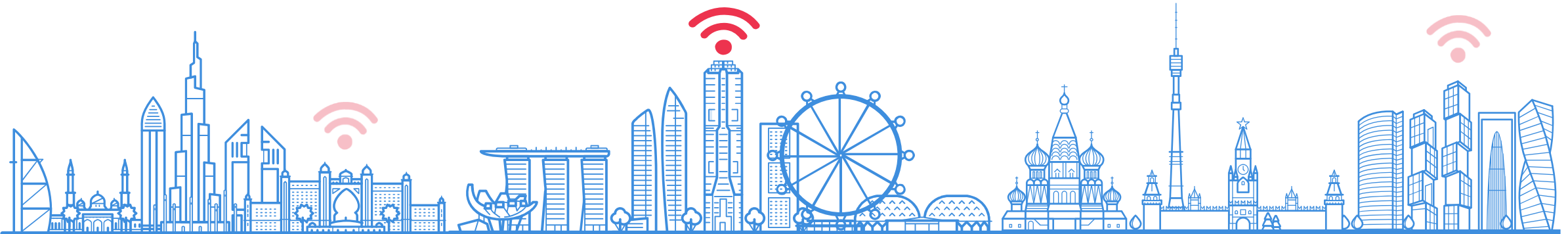
United for Smart Sustainable Cities (U4SSC): [Homepage >](#)

- U4SSC initiative backed by 19 UN partners committed to SDG11
- 150+ cities evaluating progress towards smart-city objectives and the SDGs with U4SSC Key Performance Indicators based on ITU standards
- [7th U4SSC meeting](#) held online in June and appointed [new U4SSC management team](#)
- Meeting also announced new U4SSC Country Hub in Kyebi, Ghana, the first in Africa
- [Three new U4SSC publications in 2023 >](#)
- [Five new ITU publications in 2023 >](#)



Digital transformation webinars

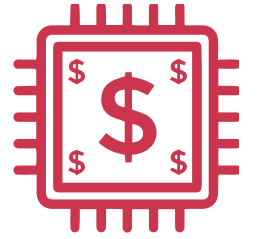
- [All episodes >](#)
- Reshaped as Digital Transformation Dialogues in 2024: Webinars, fireside chats, ask the expert sessions...





Digital financial inclusion and fintech

[Overview web page >](#)



New cybersecurity resilience assessment toolkit

- New [cybersecurity resilience assessment toolkit for DFS critical infrastructure](#) published in October



DFS security recommendations adopted at regional level in 2023

- Formally adopted by the East African Communications Organisation (EACO) and the Communication Regulators Association of Southern Africa (CRASA)
- Discussions ongoing with the West Africa Telecommunications Regulators Assembly (WATRA)



DFS Security Lab

- [Security clinics conducted in the reporting period >](#)
- Knowledge transfer programme support telecom regulators in emerging economies
- Knowledge sharing platform launched in October
- One-year partnership with FNSV Korea launched in August to promote passwordless technology in mobile payments using blockchain secure authentication
- 2023 activities supported by funding from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Republic of Korea's Ministry of Science and ICT

Topics

▶ ITU

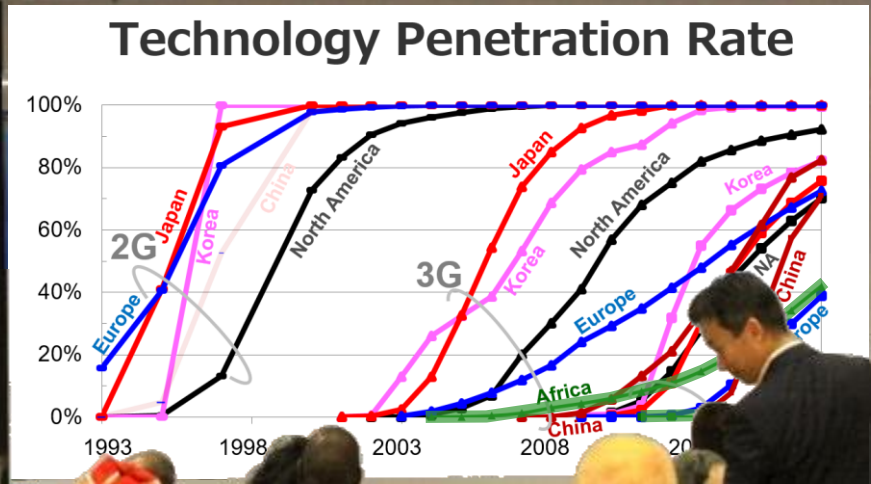
▶ **Thought on Standardization**

▶ History of Generations: 1G to 5G

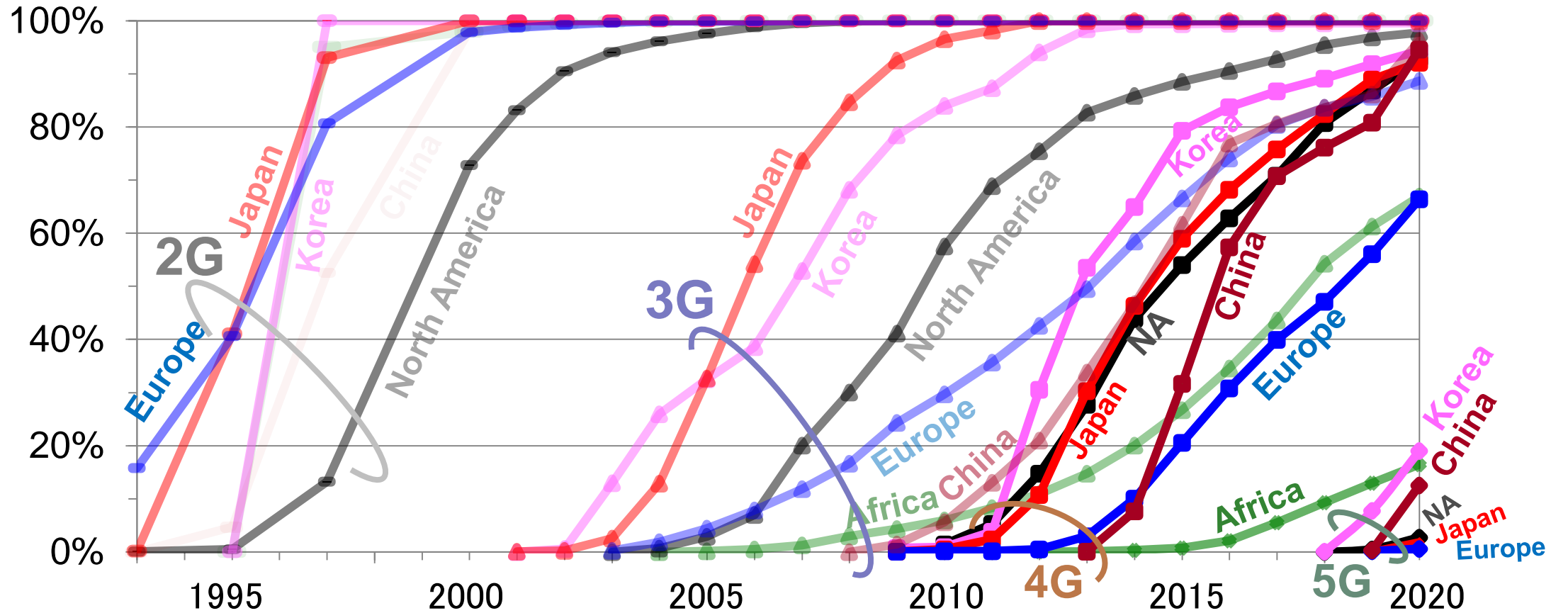
▶ Future Beyond 6G toward 12G



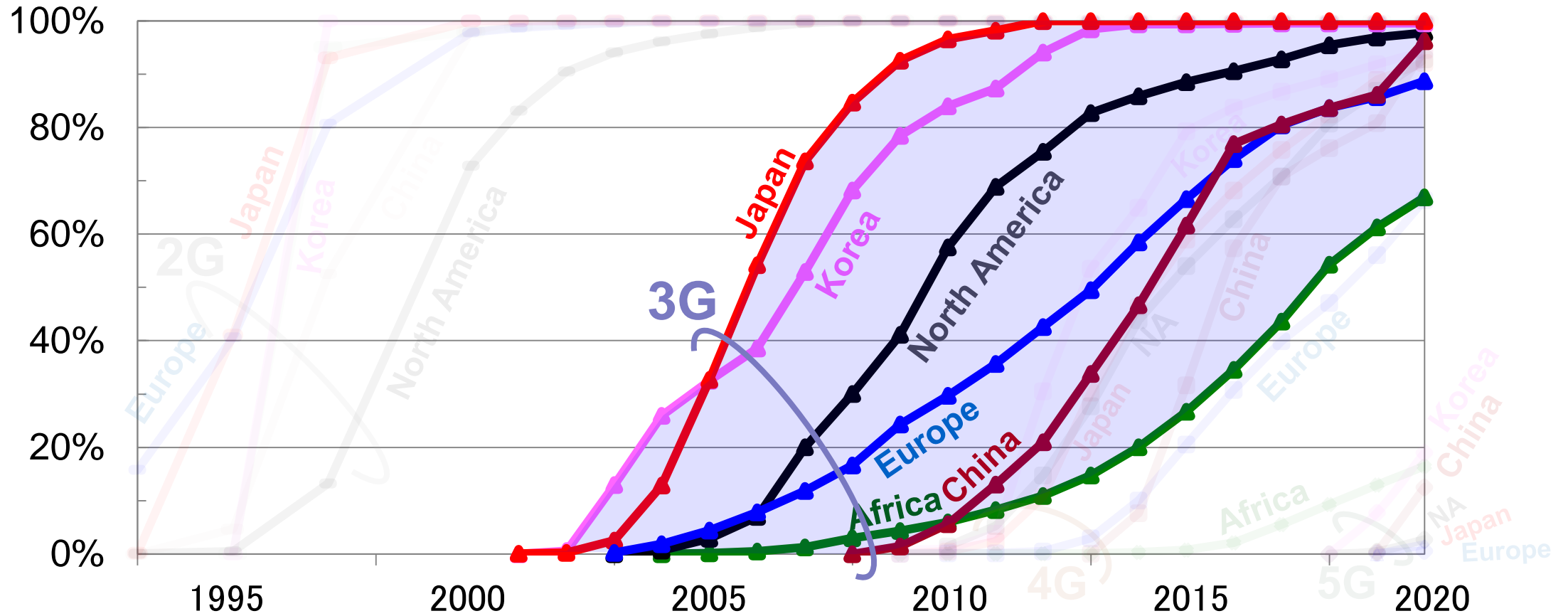
WWRF 5G HUDDLE 2018 in DURBAN, SOUTH AFRICA



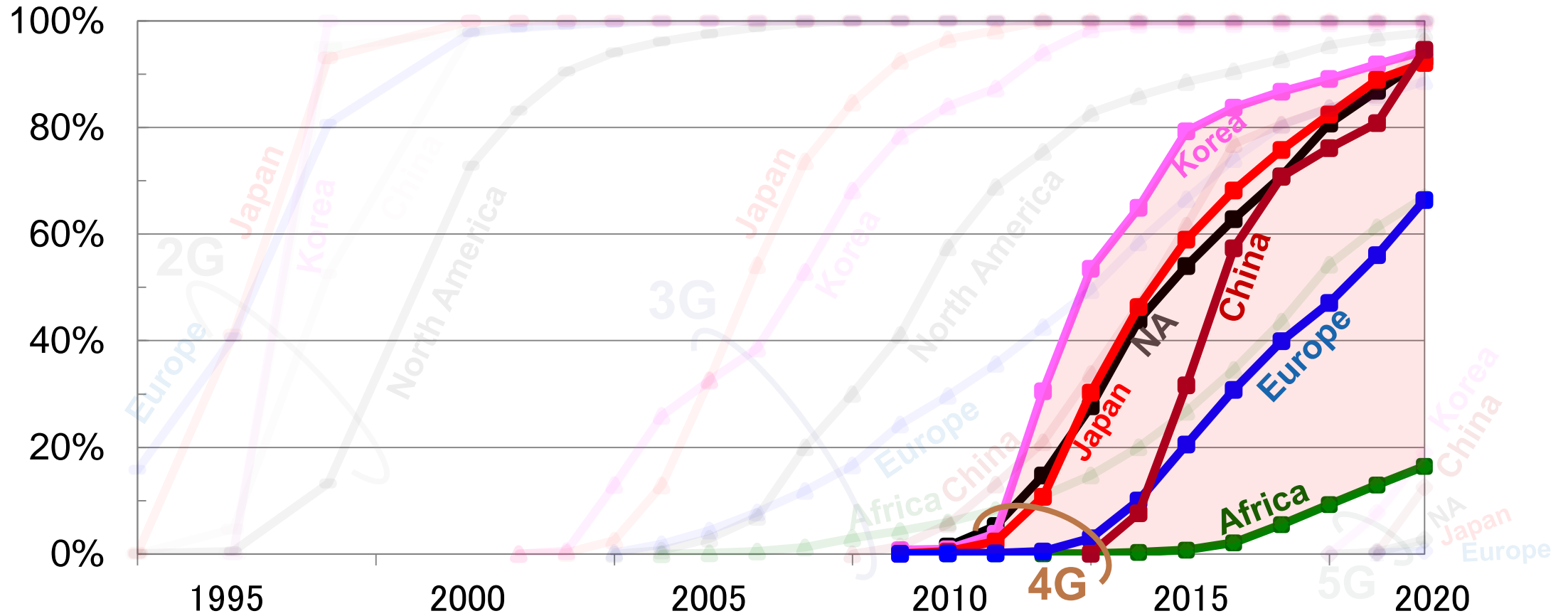
Technology Penetration Rate



Technology Penetration Rate



Technology Penetration Rate



Standardization Gap

1G

2G

3G

4G

5G

6G

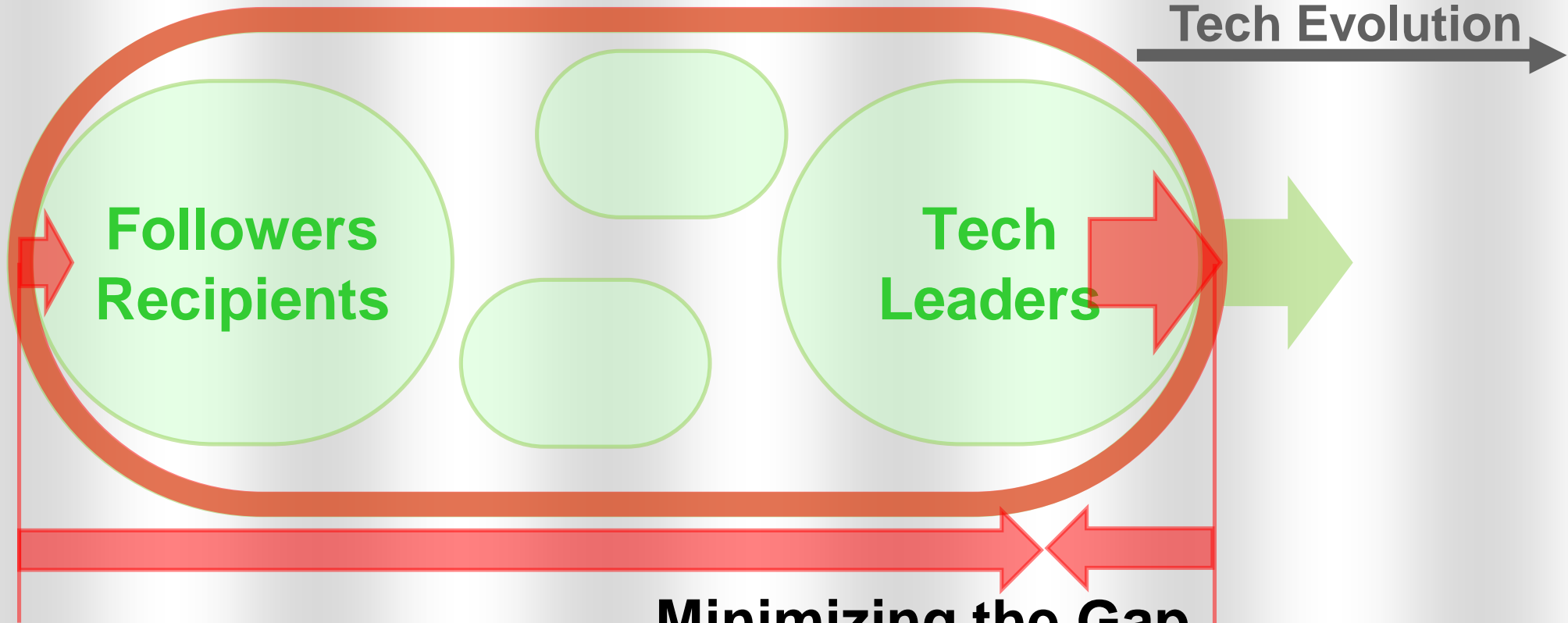
7G

Tech Evolution →

Followers
Recipients

Tech
Leaders

Minimizing the Gap





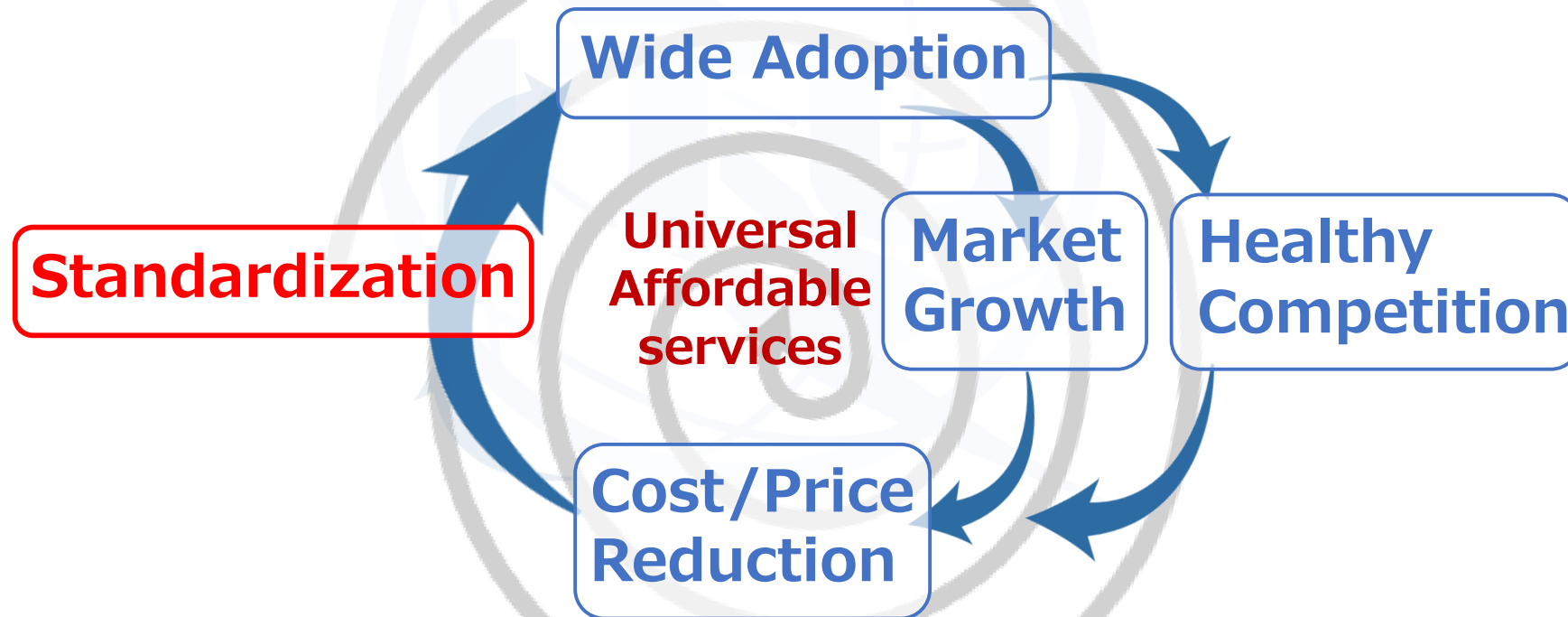
My Vision

Outreach worldwide

“Standards and technologies are meaningful only after people could use them. Enabling people around the world to benefit from technology – that’s what we do.”

Value of standardization

- Standardization becomes truly valuable and meaningful only when the standards are widely spread.





Strengthening Cooperation

By strengthening cooperation between multiple standardization bodies.

In response to rapid technological advancements and the expanding landscape of technical fields, we are collaborating with diverse roles and expertise to reach.

Collaboration leveraging each other's strengths is crucial. ITU's greatest advantage lies in its global reach.



Industry Engagement

*Through **industry engagement** and the **implementation of standards** by industry.*

The industry play a role in implementing the standards and contributing to technology diffusion. The industry engagement drives the development of implementable standards and their adoption in practice.



Bridging the Standardization Gap

*ITU-T **Bridging the Standardization Gap (BSG)** as essential tool for the dissemination of standards.*

Bringing the benefits of technology to the world by strengthening standard-making capabilities and assisting the application of standards in developing countries.

World Standards Cooperation(WSC)



Standardization Programme Coordination Group (SPCG)

- Review standardization activities in IEC, ISO and ITU-T and identify areas where coordination is required and/ or could be enhanced
- Provide recommendations and mechanisms for coordination, collaboration and joint work

World Standards Day

- Each year on 14 October, the members of IEC, ISO and ITU celebrate World Standards Day

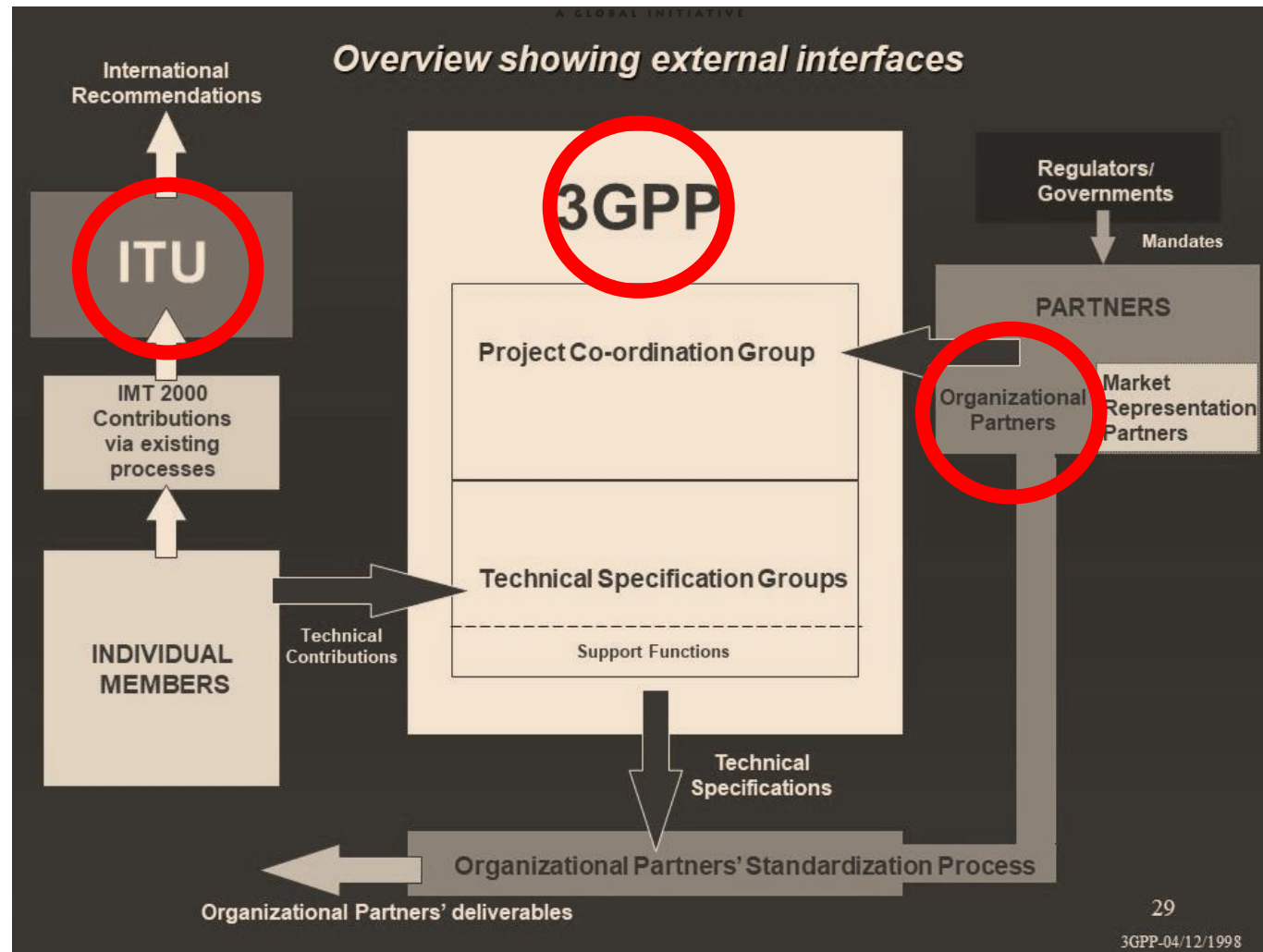
G20: International Standards Summit

- Under the G20 Presidency, the standardization bodies together with the IEC, ISO and ITU, are organizing the International Standards Summit

Green Digital Action@COP28

- WSC hold the session on International Standards for sustainable digital tech

3GPP framework for 3G and beyond with 3GPP, regional SDOs and ITU



But How?



Strengthening Cooperation

*By **strengthening cooperation between multiple standardization bodies.***

To respond to rapid technological advancements and the expanding landscape of technical fields, we are now in an era where organizations with diverse roles and expertise to collaborate, rather than doing everything in a single organization.



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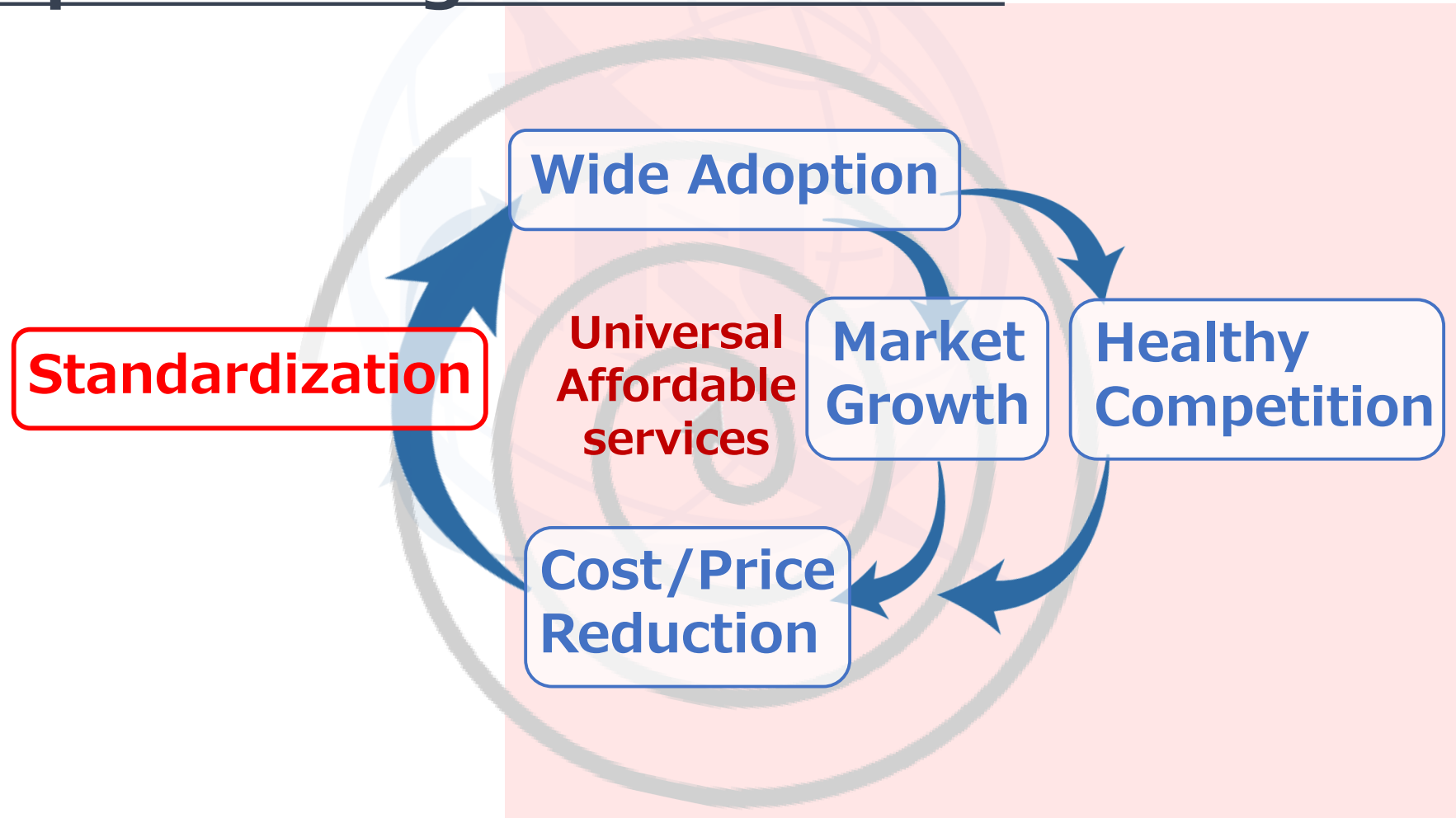
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Value of standardization

- **Industry engagement is crucial for implementing the standards.**



ITU Journal Webinars

New WEBINAR SERIES with CTOs

6 June 2023

The journey from 5G to 6G: Toward a well-being society

Naoki Tani

Executive Vice President and Chief Technology Officer, NTT DOCOMO



27 June 2023

AI, machine learning RAN intelligent controller for 6G

Alex Jinsung Choi

Senior Vice President, Deutsche Telekom



4 July 2023

Transformation in the 5G era

Alex Sinclair

Chief Technology Officer, GSMA



9 November 2023

Creating the foundation for 6G: Laying the groundwork for the network of the future

Nishant Batra

Chief Strategy and Technology Officer, Nokia



21 November 2023

Aimed at transformation: Telecom network technology development

Wang Xiaoyun

Chief Scientist and Deputy Chief Engineer, China Mobile



ITU Journal
*Future and evolving
technologies*

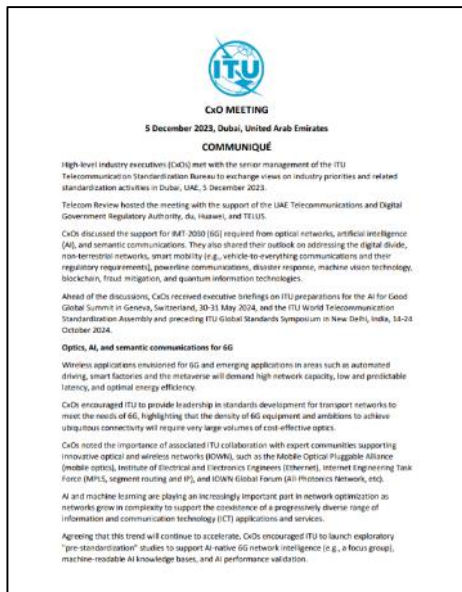


CxO Roundtable (Dubai, 5 December 2023)



34 C-level executives
present in person

Communiqué



- Support for **IMT-2030 (6G)** required from optical networks, AI, and semantic communications - **transport networks to meet the needs of 6G, AI-native 6G network intelligence, machine-readable AI knowledge bases, AI performance validation** and **the architecture and framework needed for wireless networks to integrate semantic communications**
- + Digital divide, non-terrestrial networks, smart mobility, powerline communications, disaster response, machine vision technology, blockchain, fraud mitigation, and quantum information technologies

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Why BSG?

Bridging the standardization gap between developing and developed countries **is in our constitution.**

PP Resolution 123

Calls for collaboration with relevant academia, in close collaboration between ITU-T, ITU-R, while also taking into consideration the activities conducted through ITU Academy Training Centres and other capacity-building initiatives of BDT.

WTSA Resolution 44

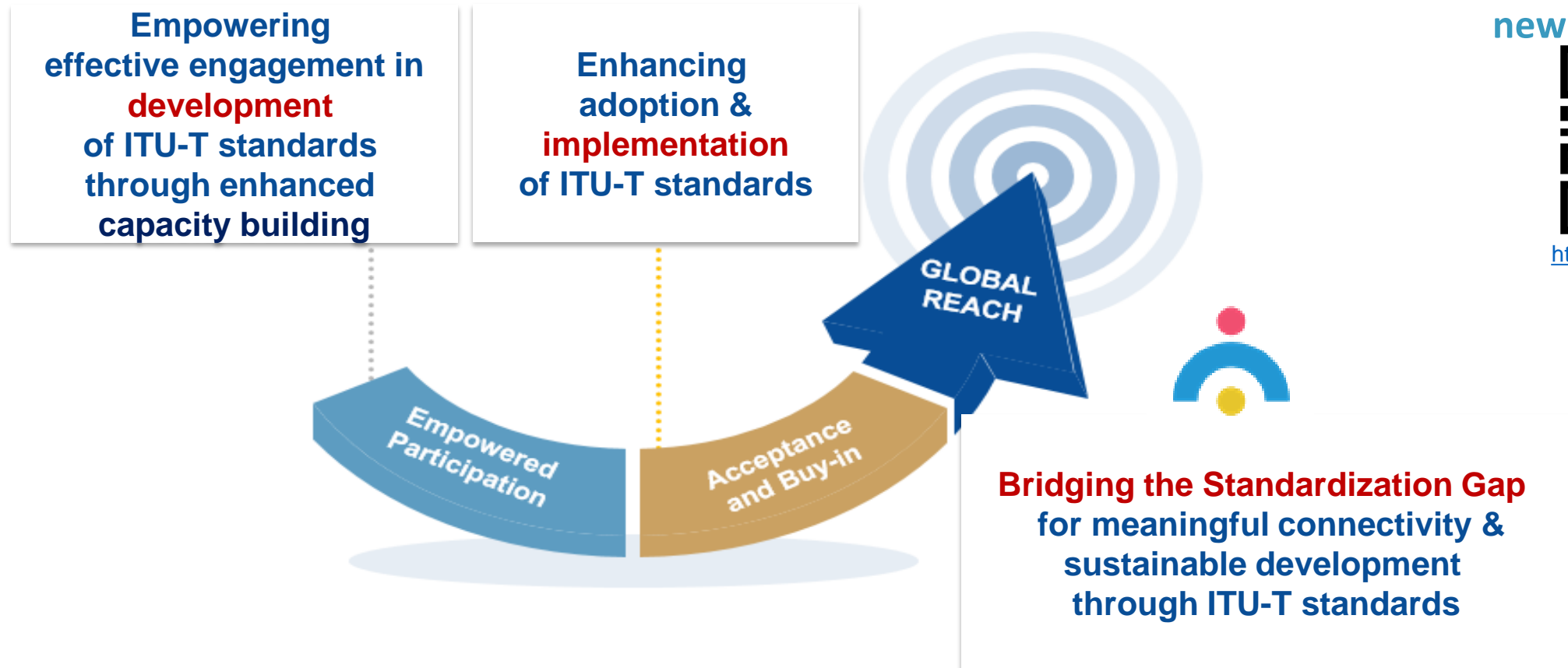
Recognizes that it is of high importance for developing countries to increase their participation in the establishment and widespread use of telecommunication standards, and to enhance their contribution in ITU-T study groups.



Outreach Worldwide

It's crucial to disseminate standards to every corner globally.

New BSG Program



Launch
new BSG website!



<https://www.itu.int/bsg/>

Outreach Worldwide

It's crucial to disseminate standards to every corner globally.

New BSG Program

Empowering effective engagement in development of ITU-T standards through enhanced capacity building

NEW

- ✓ Updated BSG trainings
- ✓ Fellowship & Language/Interpretation

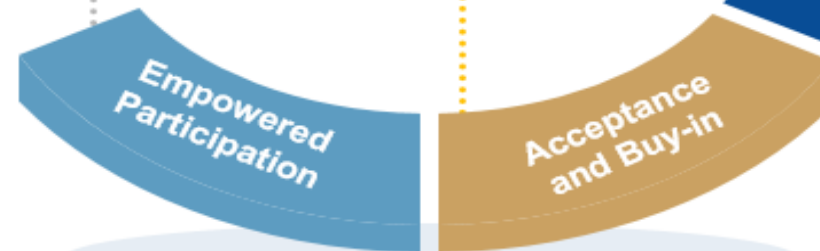
NEW

- ✓ Thematic initiatives in implementation of standards (DFS, U4SSC, CDCP, MLS etc.)
- ✓ Tools, Data Analytics & Survey/Quiz
- ✓ Strategic Events, Resource Mobilization & Outreaching

Enhancing adoption & implementation of ITU-T standards

NEW

- ✓ Cooperation & Partnership
- ✓ Funding support



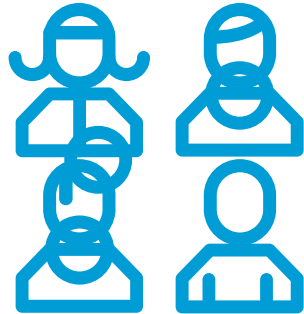
Bridging the Standardization Gap for meaningful connectivity & sustainable development through ITU-T standards

Launch new BSG website!



<https://www.itu.int/bsg/>

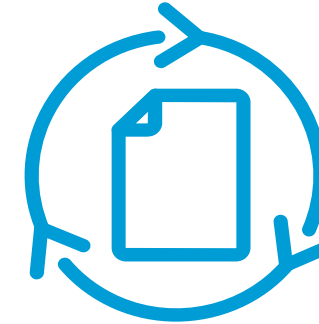
What lies at the foundation



Open and Inclusive

*Promoting **diversity** by encouraging multi-stakeholder participation in standardization processes.*

Diverse members need to be involved, including developed/developing countries, regions, gender, large/small enterprises, etc.

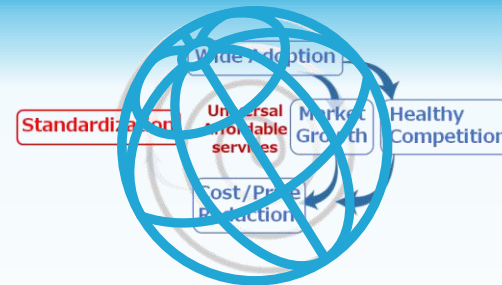


Efficient, Effective and Transparent

*Implementing **effective organizational management** through efficient resource allocation in a **transparent** manner.*

Improve organizational performance, including setting priorities, reducing waste and improving processes.

To achieve **universal meaningful connectivity** and **sustainable digital transformation** through **standardization**.



Standardization becomes truly valuable and meaningful only when the standards are widely spread.

Outreach Worldwide

My vision and goals
as TSB Director



**Strengthening
Cooperation**



**Industry
Engagement**



**Bridging
the Standardization Gap**



Open and Inclusive



**Efficient, Effective
and Transparent**

2024

30-31 May

14-24 Oct.



AI for Good Global Summit



ITU WTSA
NEW DELHI 2024

World
Telecommunication
Standardization
Assembly



ITU GSS
NEW DELHI 2024

Global Standards
Symposium

TSAG

Study Groups

SG2 SG12
SG3 SG13
SG5 SG15
SG9 SG16
 SG17
SG11 SG20

Focus Groups

FG-CD FG-AI4A
FG-MV FG-AI4NDM
FG-TBFxG FG-AN

Reginal Groups

Webinar

AI for Good ITU Journal Digital Transformation

Global Initiative

GI-AI4H U4SSC

CxO Roundtable

WSC (with ISO/IEC)

...



World Telecommunication Standardization Assembly

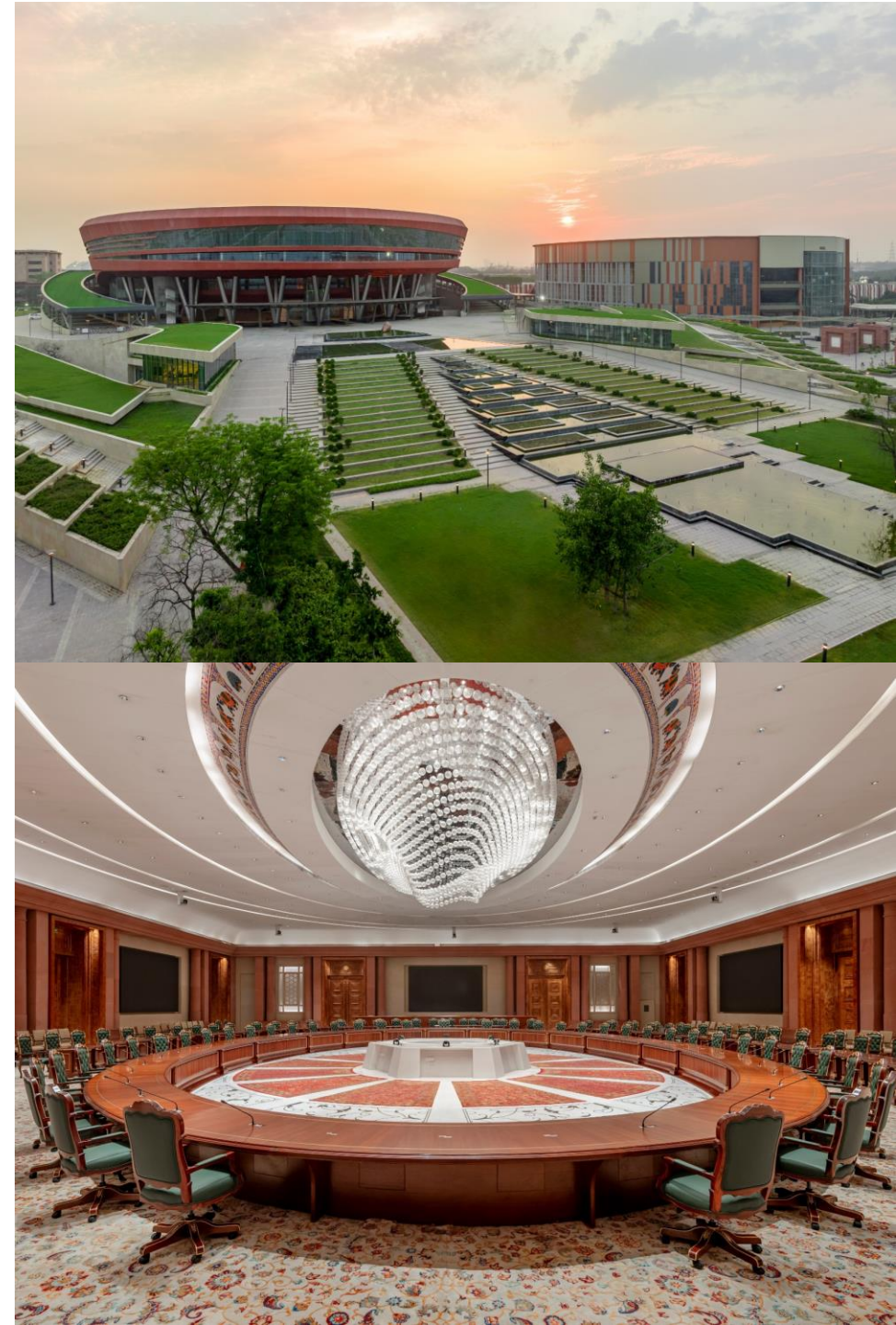
- First WTSA in Asia, 1'500++ participants expected
- Side events: Network of Women, Kaleidoscope, Expo, Indian Mobile Congress & UN Day



Global Standards Symposium

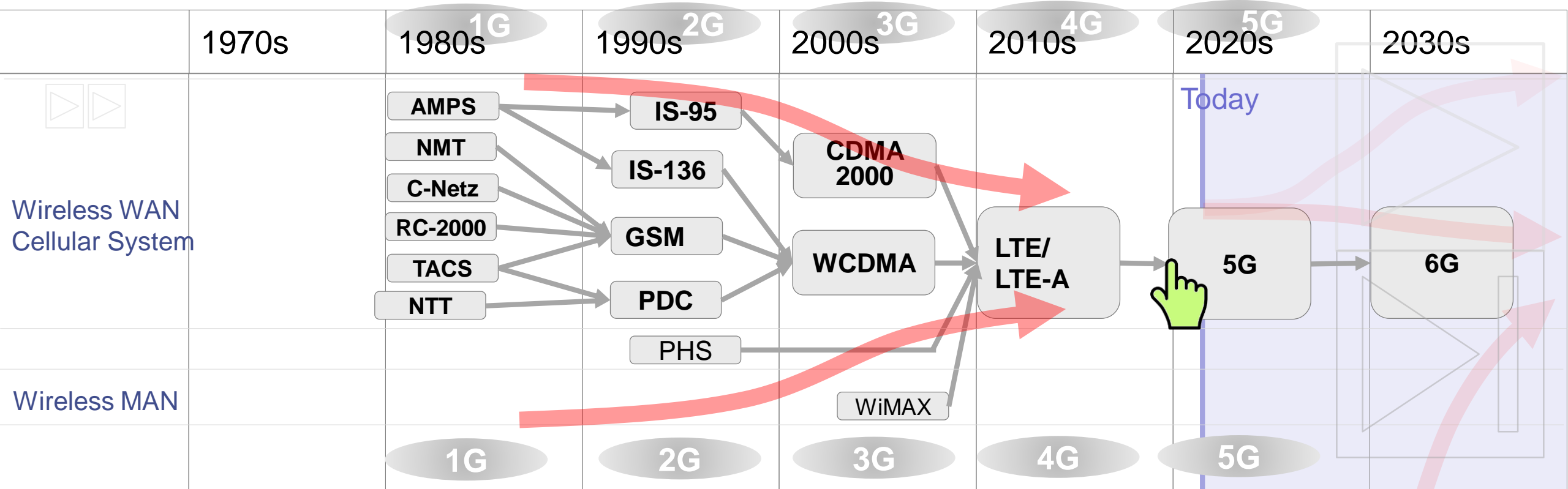
- Theme: Charting the Next Digital Wave: Emerging Technologies, Innovation, and International Standards
- High Level Segment: Ministers and CEOs

WTSA-24, 15-24 October, preceded by GSS-24, 14 October: [Website >](#)



Topics

- ▶ ITU
- ▶ Thought on Standardization
Mobile Communication
- ▶ **History of Generations: 1G to 5G**
- ▶ Future Beyond 6G toward 12G
- ▶

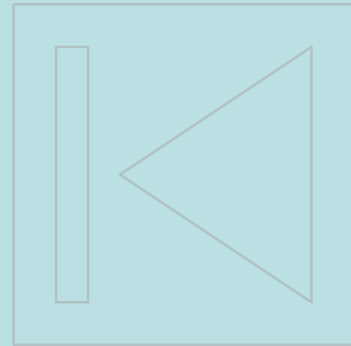


“Throughout its long history, telecom standardization has helped make people's lives more convenient and society more efficient.”

- Global coverage of services
- Cost reduction by economies of scale and competition principle

More effort is needed to achieve a truly affordable and even better ecosystem.

5G



5G

5G standard was developed based on LTE, attracting attention from various industries, and is expected to create new businesses.

A natural evolution from 4G LTE
Positive/negative aspect by 5G boom

5G Boom started. No.1 Buzz word in MWC headlines

OFFICIAL NEWSPAPER OF MOBILE WORLD CONGRESS 2015

MOBILE WORLD DAILY

Huawei and Qualcomm differ on 5G

By Paul Rasmussen

Technology vendors disagreed over the timescales for 5G deployments at Tuesday's keynote. Qualcomm's CEO Steve Mollenkopf (pictured for right) called the benefits of LTE to be fully realised to protect R&D and investment investment, whereas Huawei's CEO, Ren Zhengfei (pictured left), stressed the benefits of 5G over today's LTE. The debate is when do we call it 5G, said Mollenkopf. "There's still a lot to do." The biggest challenge we face is 5G is the extreme number of devices. There will be many new billions for billions of devices to protect and interact, and we need LTE investment, and "we don't need to make a huge technology investment, which will be very valuable for industrial applications."

KT Telecom eyes 2018 5G network; Nokia aims to be top 2 player

By Axel Harnig

A panel session on 5G small cells at Mobile World Congress also indicated that there is still a lack of clarity about when 5G small cells will be deployed. Martin Lundberg, senior specialist at Ericsson, said the vendor would evolve its small cell to 5G, "but how and when" will be decided.

5G network densification starts with 4G

Network densification is fundamental to meeting the requirements of high capacity, low latency and 100 per cent coverage in future 5G networks, but operators should already be starting to densify 4G networks.

EU digital chief hails collaborative 5G effort

Earlier in the day, at the World Congress keynote session, Gunninger mentioned that "being a 5G lead adopter requires to be a 4G leader, but Europe is still lagging behind on 4G deployments." The commissioner said that 5G infrastructure must support multiple vertical industries and promote "confidence in the future," which is "the key for investments."

2020 Olympics will demo 5G/NFV use case

London in 2012, 60-70 per cent in Sochi (2014) and almost 100 per cent in Rio."

"The Games are effectively contained almost all on the mobile. Because of that, people not only want competition results, they want a lot more information - data compared to previous games. For mobile handset. However, this architecture, and those that...

NGMN unveils 5G operator wishlist

By Paul Rasmussen

5G White Paper unveiled by the Next Generation Mobile Networks (NGMN) Alliance aims to settle industry debate over...

Ericsson CTO questions 5G connected car

By Paul Rasmussen

being a new frontier with the use case for 5G not clear, with way too much speculation today." This is despite Ewaldsson confirming that some attributes of 5G, such as its ultra-reliability mode, where received data rates and latency are almost guaranteed, would be very experienced by operators. "Operators around the world are suffering from flat or very low revenue growth rates, typically between 0.5 and 2 per cent. This places them under enormous capex pressure, to the extent that the consensus of capex spend is -1 per cent across most operators." "If we [the industry] get 5G right then this could be a way for the operator community to find a way out of this near-stagnant environment. We believe that 5G could trigger a new growth phase for operators, with 30 per cent being possible." Ewaldsson claimed that, while the smartphone had proved enormous value to the consumer...

Europe needs to start 5G trials, say tech leaders

By Ken Willard

High-profile tech leaders commercial 5G in at least one city in each of the European Union, member states by 2020. There is

Operator growth depends on 5G appealing to verticals

Ken Hu, Deputy Chairman and Acting CEO, Huawei Technologies

"unless we can grow, we will die - or industry is in real danger"

make billions of dollars investments in R&D partnerships. It has to be cost effective for brands from legacy systems, and it be open." He argued that the standardisation process has more open than any previous standard, and costs have dropped due to the availability of more source software. "I think the very good returns on investment case for making this happen." Huawei's Tong said application like remote surgery good example of how the future network can serve multiple use cases without having to gold-plat

5G - The Road to

Moving towards 5G:

Myths about 5G



People are trying to jump on the 5G bandwagon.

➤ **For 5G, all things need something new.**

➤ **5G needs significant investment.**









Beyond 5G

International Conference 2021

Host: Ministry of Internal Affairs and Communications of Japan,
Beyond 5G Promotion Consortium (Co-host)
Date: Nov 9 (Tue.) - Nov 10 (Wed.), 2021



Beyond 5G

INTERNATIONAL CONFERENCE 2021

MIC



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Beyond 5G

INTERNATIONAL CONFERENCE 2021

MIC



Beyond 5 G

INTERNATIONAL CONFERENCE 2022

5G 國際論壇

















2023 Brooklyn 6G Summit 10th edition

31 October – 2 November

Creating the Foundation for 6G



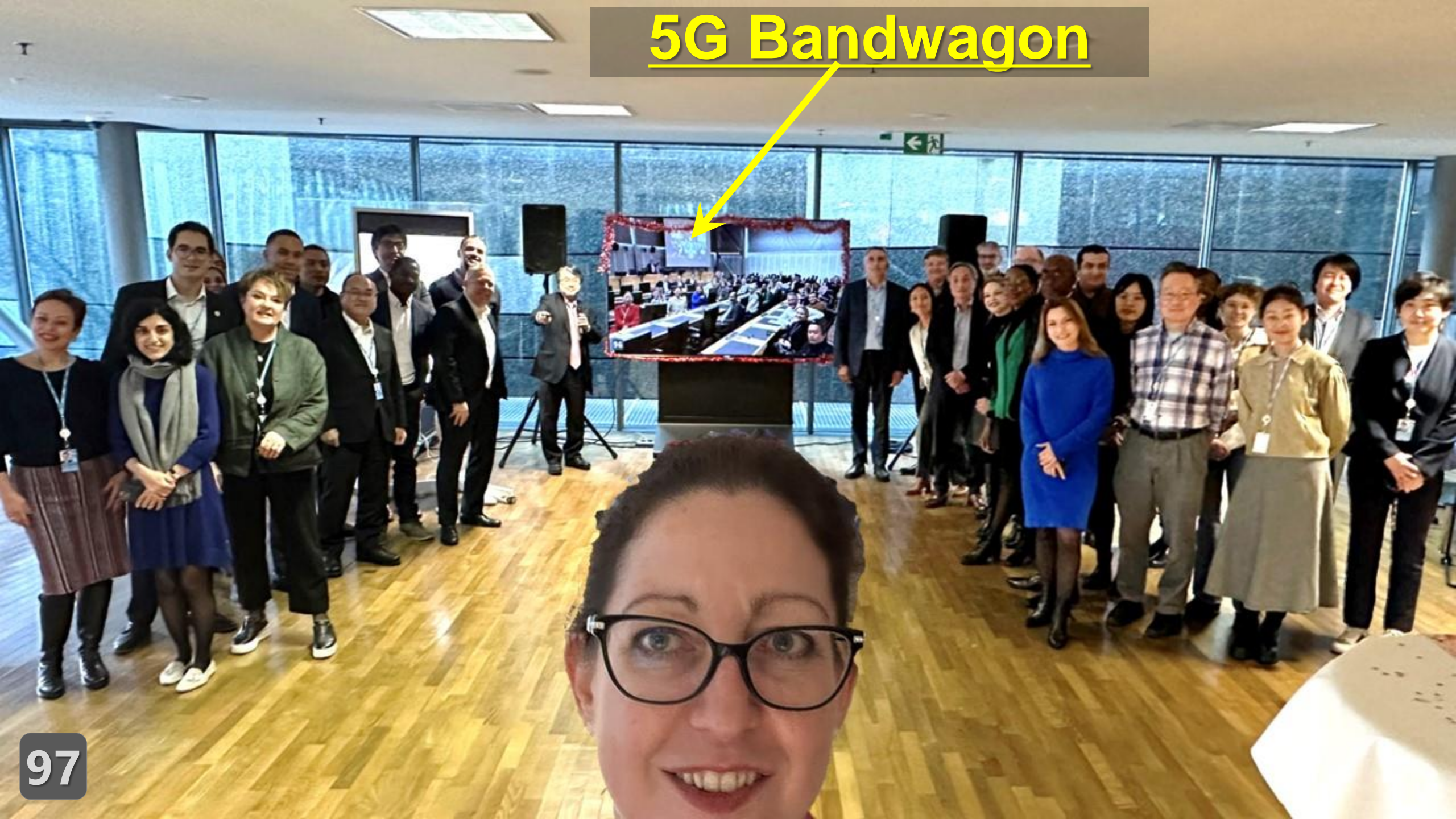
2023 Brooklyn 6G Summit
10th edition
31 October – 2 November







5G Bandwagon



Myths about 5G



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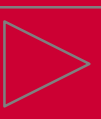
➤ **5G needs significant investment.**

5G



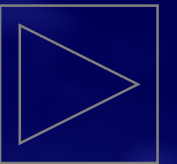
Let's get on the 5G bandwagon
and create new business models
through the collaborations across industries.

The cross-industry collaboration will be the key to success for 5G.
6G discussion has begun: Hope to discuss standards for sustainable further evolution for 6G and after.



Topics

- ▶ ITU
- ▶ **Thought on Standardization**
- ▶ History of Generations: 1G to 5G
- ▶ Future Beyond 6G toward 12G
- ▶ **A thought on
Mobile networks and Generation**



ITU-R M.2160 on the “IMT-2030 Framework” (November 2023)

FIGURE 1

Usage scenarios and overarching aspects of IMT-2030

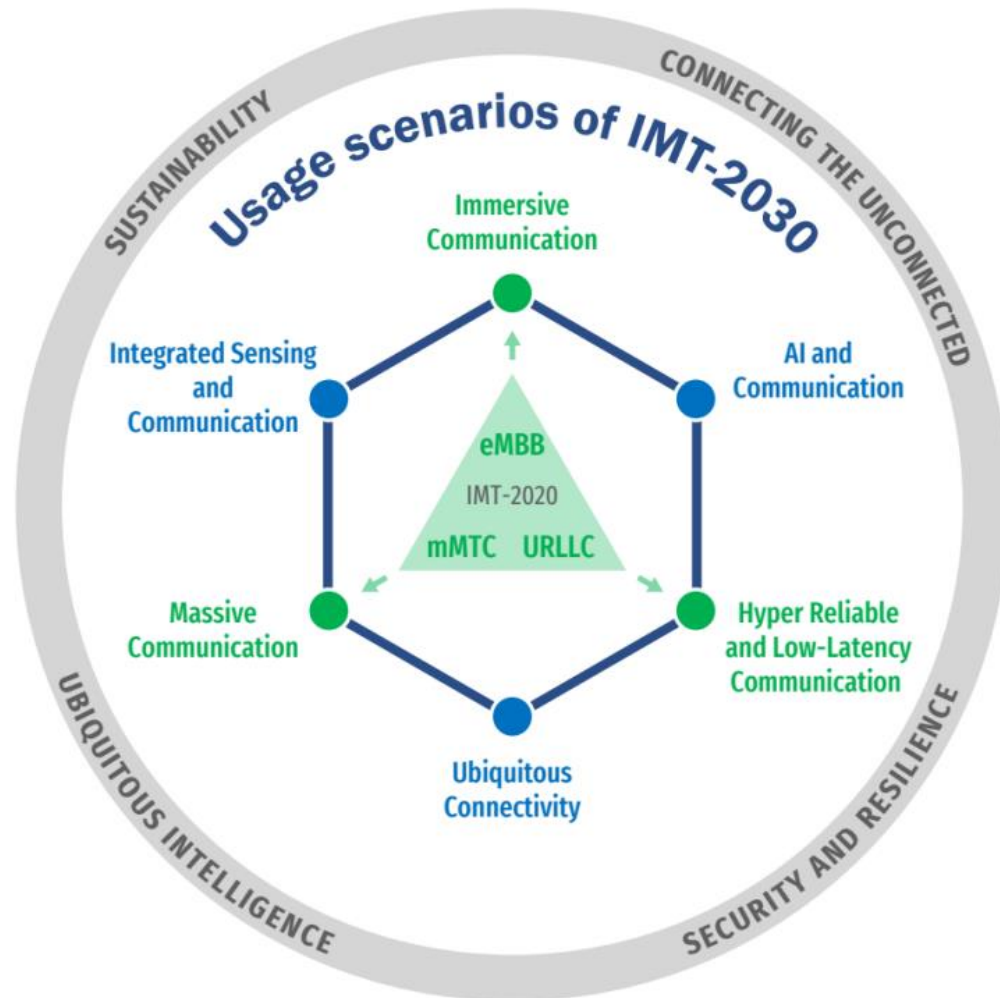
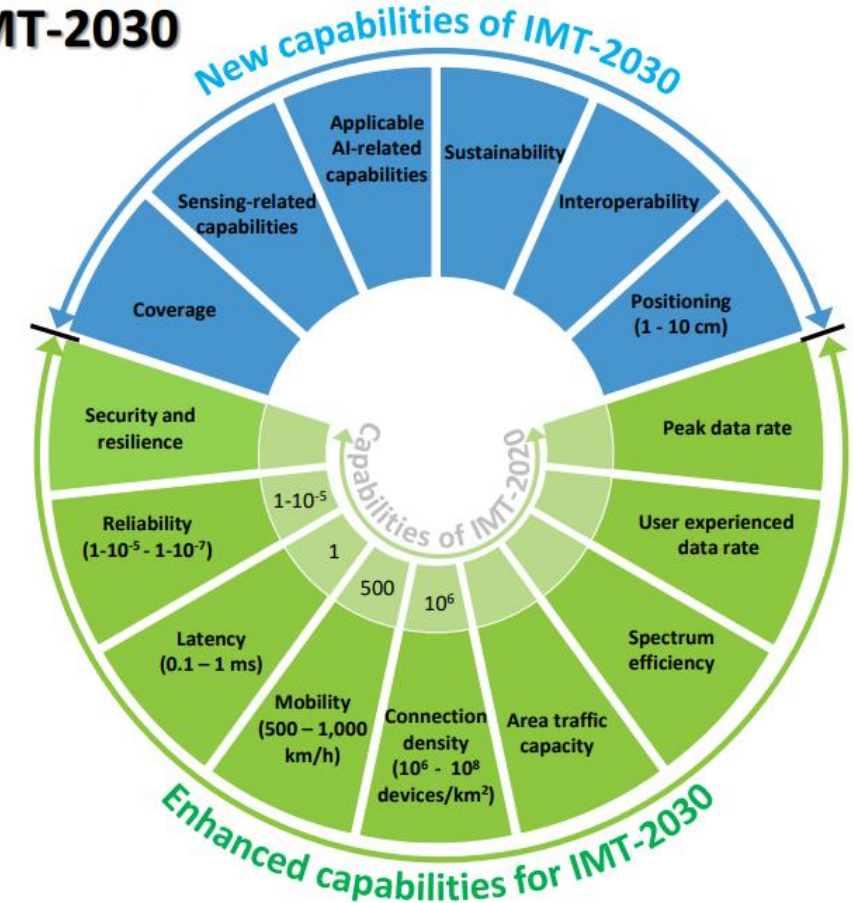


FIGURE 2

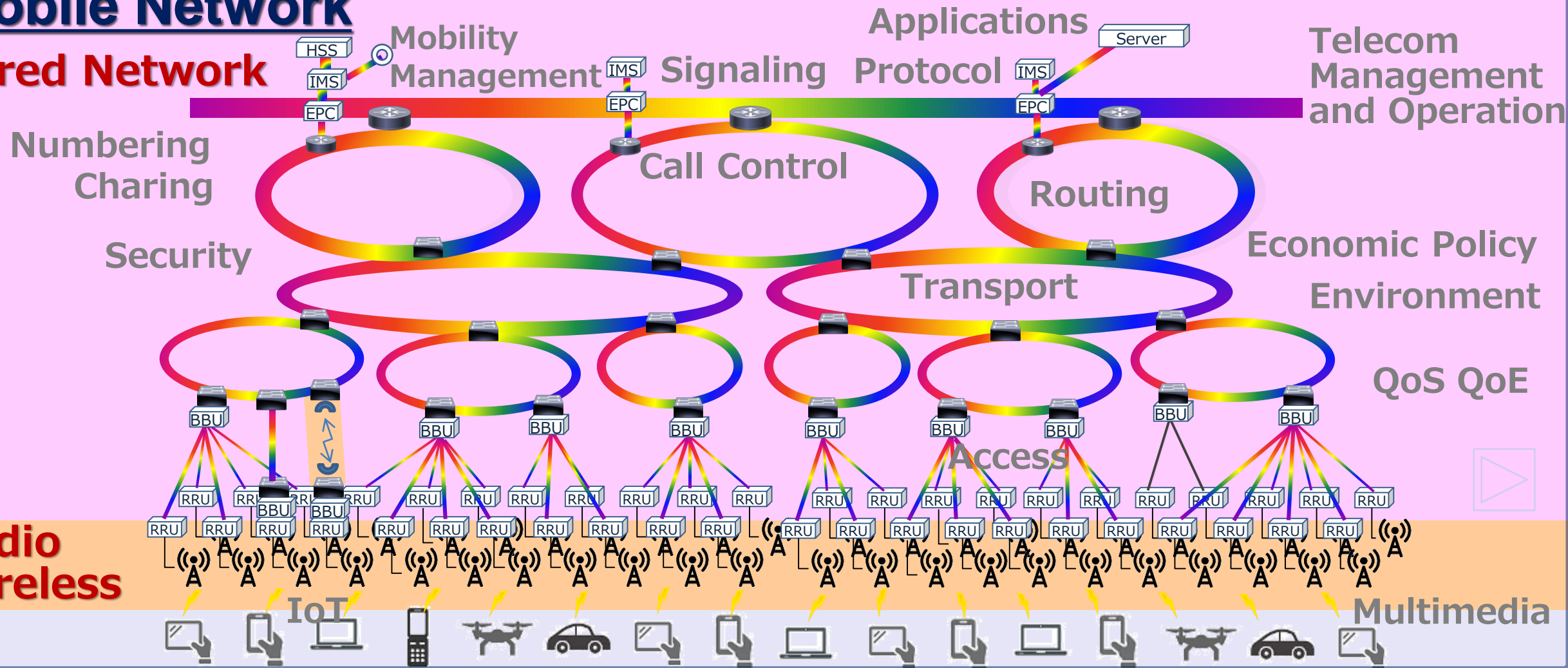
Capabilities of IMT-2030



Mobile in Telecom Networks

Mobile Network

Wired Network

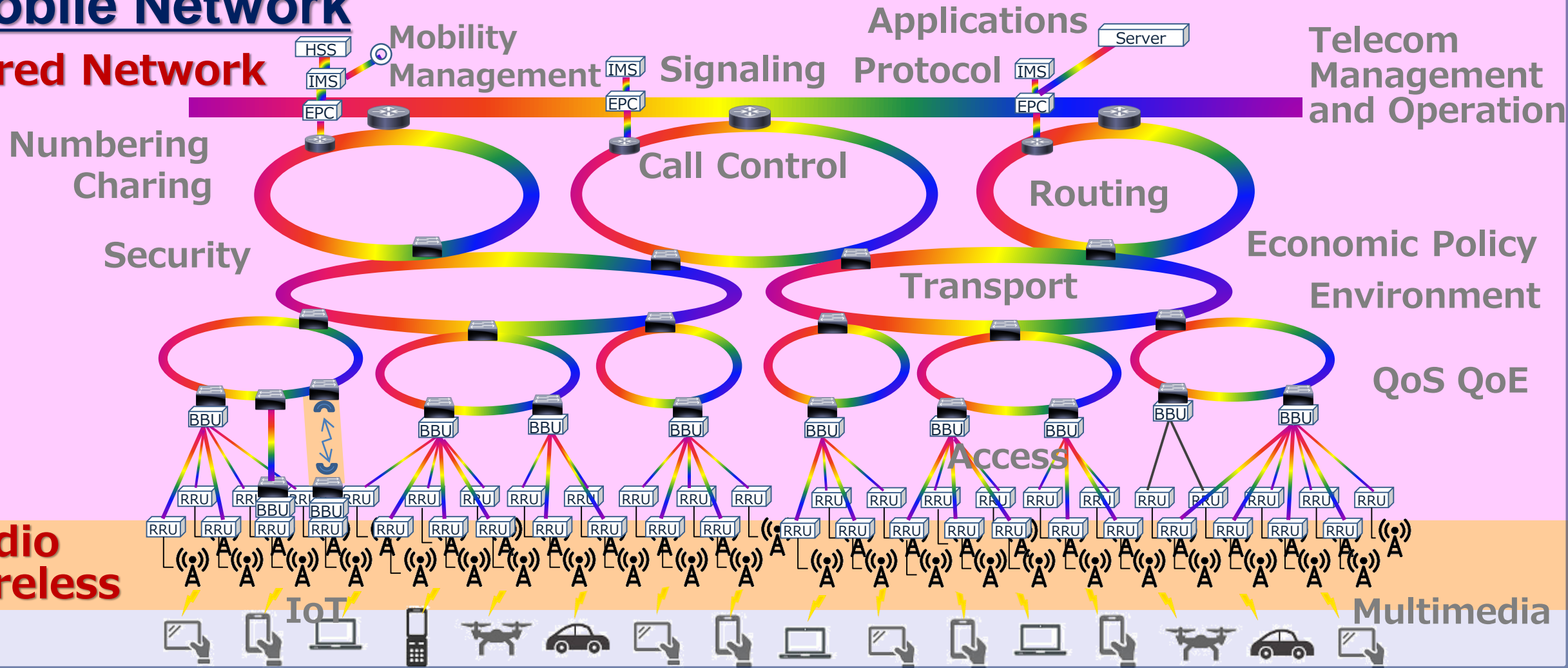


Mobile networks consist of many technological elements.
Many of them are evolved independently of generations.

Mobile in Telecom Networks

Mobile Network

Wired Network



Many of technological elements are evolved independently of generations. (Generation-agnostic)

Conclusion

- Outreach worldwide: Standardization becomes meaningful only when standards are widely spread.
- Pursue the sustainable and meaningful evolution of the mobile generation without being misled by marketing.
- Contribute to the evolution of generations by pursuing the evolution of generation-agnostic technological elements.



Thank you