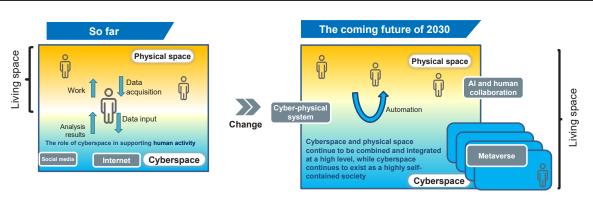
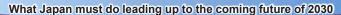
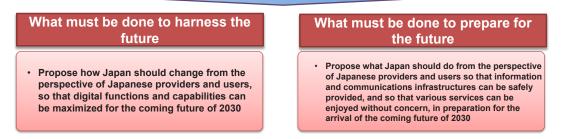
# Chapter 5

## **Policy Focus -1**

- 1. Direction Japan must take toward the coming future of 2030
- (Figure1 in White Paper)







### 2. Coming future of 2030



(Source) Final report on "Information and Communications Policy with a View to 2030"

#### 3. Overview of the final report on "Information and Communications Policy with a View to 2030"

#### Issues facing Japan: Provider perspective

[1] Response to the rapid evolution of AI 1.

	Learning data used for generative AI and foundation models developed and provided mainly in the U.S. is biased toward Anglo-American culture.	(
2.	Response to the promotion of business transformation and carbon neutrality	
[2]	Importance of actuators	L
	Actuators are needed to upgrade cyber-physical systems including providing	Ł

feedback to physical space. Changing stakeholder needs and lagging business

#### transformation

[3]

nitiatives to harness the future

p

5

Initiatives

- There has been a delay in responding to changes in consumer values from wnership to use
- Japan ranked 29th out of 63 countries/regions in the World Digital Competitiveness Ranking 2022.
- In 2021, Japan ranked 27th out of 38 OECD countries in labor productivity. Digital business transformation (DX) is inevitable. There is a delay in DX for SMEs.

#### Rule formation in global markets [4]

- It is said that Japan often wins in technology but loses in business
- Overseas, apply an open and closed strategy that leverages the advantages of the domestic industry. In Europe and the U.S., ensure that industry and the government work together
- to form rules and acquire market share.

#### [5] Fostering startups that are innovation creators

- There are fewer unicorns than in other major countries. There are no "decacorns' in Japan valued at more than one trillion yen. In Japan, there are few M&As and investment by operating companies is low.
- In Europe and the U.S., late-stage investment accounts for the majority. In Japan, seed-stage investment is the norm. There is a lack of accelerator roles in the growth phase of global expansion.

#### Competitive environment of the ICT industry [6]

- Excess imports of ICT goods have increased, and the digital field is highly dependent on foreign countries
- The U.S. government released a report recommending the promotion of Al innovation Europe is promoting digital transition through the "Digital Europe Program."

#### Issues facing Japan: Provider perspective

repare for the future Initiatives to harness the future	3.	Response to environmental changes in information and communications infrastructures
	[6]	Competitive environment of the ICT industry
	:	There are signs of changes in the competitive environment of the ICT industry. The business environment surrounding big tech companies in the U.S. is also changing.
	[7]	Expectations for seamless networks
	•	Expectations are rising for dependable information and communications infrastructures with a high level of reliability, stability, and sophistication of user experience.
	•	The degree of freedom in the construction of networks is increasing, the number of stakeholders involved is increasing, and the distribution structure of communications services is become more diverse and complex.
	4.	Creation of environments for the new social space of cyberspace
	[8]	The proper balance between privacy and the desire for exposure
	•	It may be easier to get log information in the metaverse than in physical space, which could cause privacy violations. The personal adjustment process (including balancing the desire for privacy with the desire for disclosure) is difficult in the cyberspace while it has been achieved in the physical space.
le	[9]	Mixing of the metaverse with reality

- Rules applied within the metaverse vary from platform to platform.
- It is not possible to move freely between various platforms. It is not clear whether violations or invasions of privacy could occur within the
- metaverse, or even whether an avatar actually represents a real person
- Rules in the metaverse need to be coordinated with legal systems in reality

#### What Japan must do

#### Realizing an environment for using generative AI in Japan

- O Build AI (Japanese language AI foundation models) that reflects Japanese culture, etc
- O Review system among diverse stakeholders

#### Realization of cyber-physical systems that will be implemented globally

- The ICT industry is expected to be the driving force behind digital technologies 0 Create new businesses and strengthen international competitiveness in the ICT industry by actively supporting projects that aim to commercialize automation and
- carbon neutrality through upgrading cyber-physical systems using robots, etc. 0 Accelerate innovation and promote regulatory verification in a unified manner including opportunities to put ideas into practice and verify regulations
- 0 Conduct planning and development from a global perspective, form partnerships. and collaborate with overseas companies, etc., through such means as refraining from customizing products/services to Japanese specifications
- Implement digital technologies across the entire supply chain, including local 0 SMEs.

#### Involvement in active standardization and rule formation

- The public and private sectors must actively cooperate in international rule
- 0 form
- 00 Clarify a sense of purpose for standardization goals
  - In order to realize an ecosystem that transcends the boundaries of regions, industries, and business types, we must unify formats and protocols between systems and ensure interoperability of interfaces

#### Collaboration between startups and large enterprises

- The government announced its "Five-Year Plan for the Development of Startups," and aims to invest 10 trillion yen, create 100,000 startups, and create 100 unicorns
- 0 Build a system in which operating companies with excellent technology, human resources, and the desire to quickly realize innovation cooperate with startups

#### What Japan must do

#### Sophistication and active involvement of information and communications infrastructures

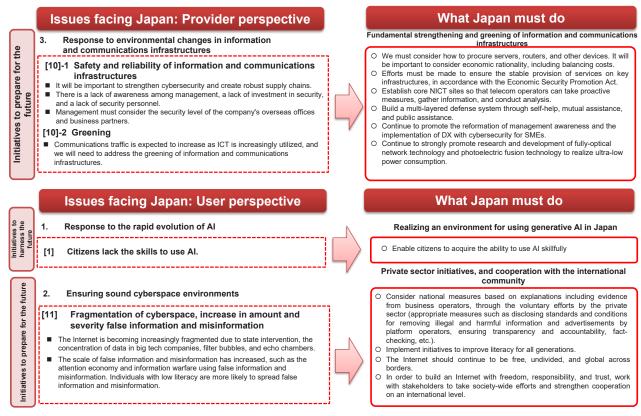
- Strengthening and accelerating initiatives for Beyond 5G (6G) Strengthen support for research and development aimed at social
- implementation and overseas expansion, focusing on technological fields where Japan has strengths. Ensure operational technology. Responding to the needs of the competitive environment and users, for
- information and communications infrastructures → Consider future networks from the viewpoint of users
- Realize a society in which human resources supporting information and communications infrastructures are ensured and respected. Ensuring information and communications infrastructures serving as social
- infrastructures
- → The government must be actively involved in both support and regulation.
- It is important to realize that cyberspace is a global commons
- O Initiatives for new networks in 2030 and beyond
   → In promoting Beyond 5G (6G), develop technologies that solve and overcome the challenges and limitations of current networks, and propose new architectures as needed.

#### Realization of a democratic metaverse

- 0 The international community must commonly recognize that the metaverse is an online public space where freedom of expression and privacy protected, and that its operation must be conducted democratically. 0 Continue to understand and verify the role of platform operators International rule formation must be promoted in cooperation with the
- international community. 0 Promote collaboration between the public and private sectors, ministries and

digital technologies must be developed.

agencies, and the international community to form rules for the metaverse, such as ensuring portability of avatars among metaverse platforms. An architecture that enables users to control the appropriate handling of data, including personal information protection in response to advar : in



(Source) Final report on "Information and Communications Policy with a View to 2030"

## Section 2

1. "#NoHeartNoSNS (no social media without heart!)" related content (Figure5-2-5-1 in White Paper)

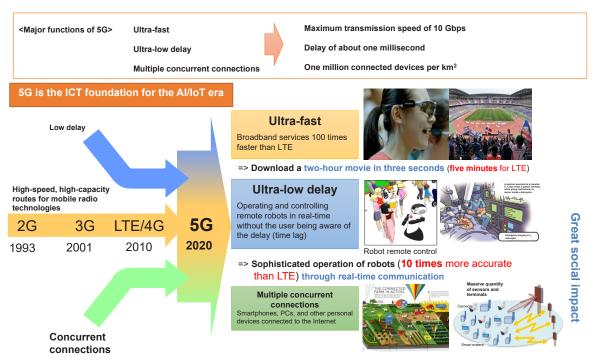


\* Left: #NoHeartNoSNS (no social media without heart!) logo \* Right: "Eagle Talon #NoHeartNoSNS Operation" main visual 2. Filtering and anti-piracy videos for young people (Figure5-2-5-2 in White Paper)

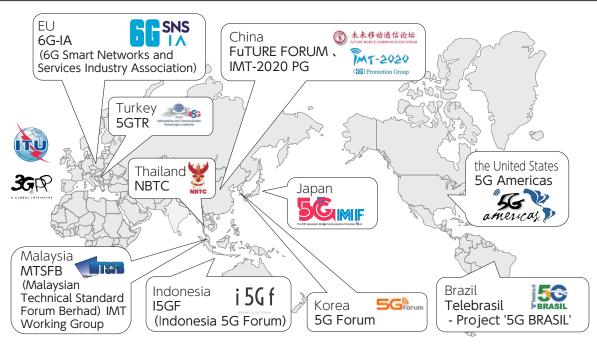


## Section 3

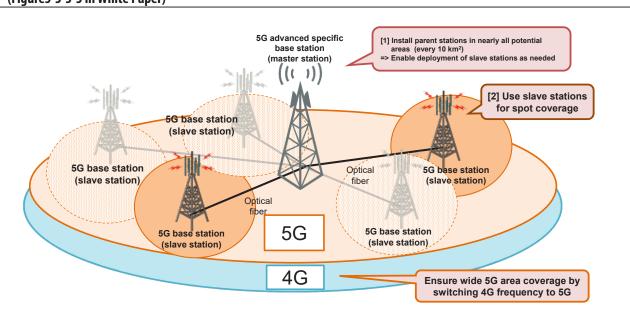
- 1. 5G features
- (Figure5-3-3-1 in White Paper)



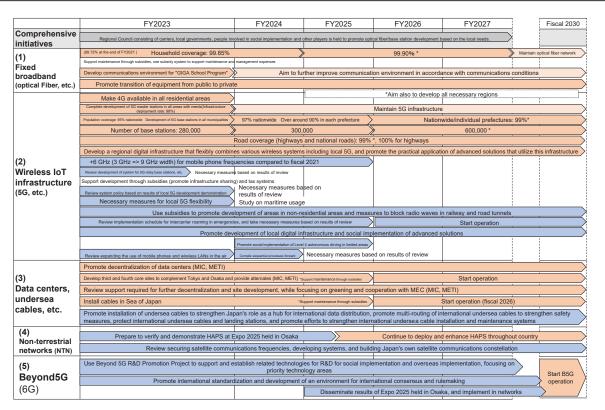
2. Organizations promoting 5G in each country/region (Figure 5-3-3-2 in White Paper)



3. 5G development (Figure5-3-3-3 in White Paper)

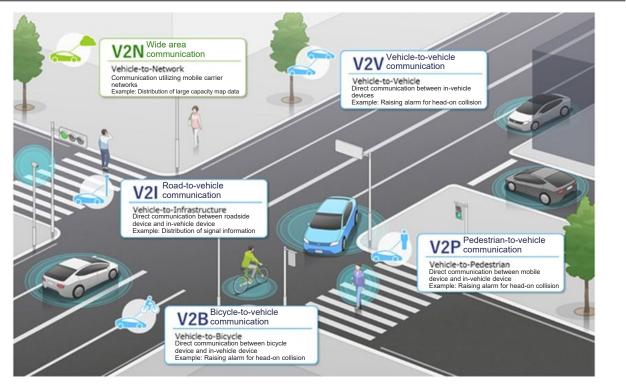


### 4. Development of Digital Garden City Nation infrastructure (roadmap) (Figure 5-3-3-4 in White Paper)



### 5. V2X communication

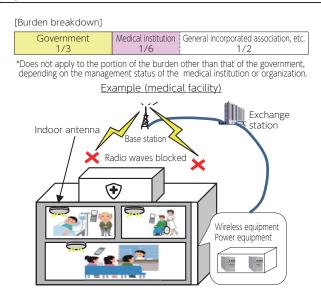
(Figure5-3-4-1 in White Paper)



6. Implementation of Public Safety LTE (Figure 5-3-4-2 in White Paper)



7. Project to block radio waves in medical facilities (Figure 5-3-6-1 in White Paper)



## Section 4

1. Overview of report by the "Study Group on the Ideal Broadcasting System in the Digital Age" (published on August 5, 2022)

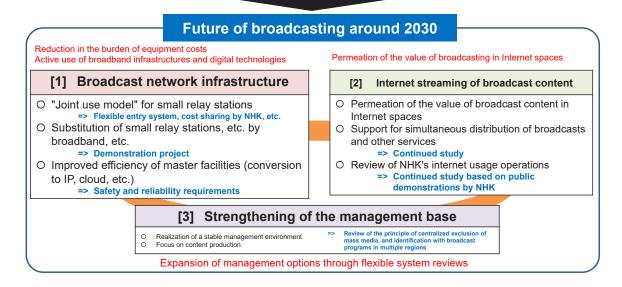
### (Figure 5-4-2-1 in White Paper)

#### Major environmental changes surrounding broadcasting

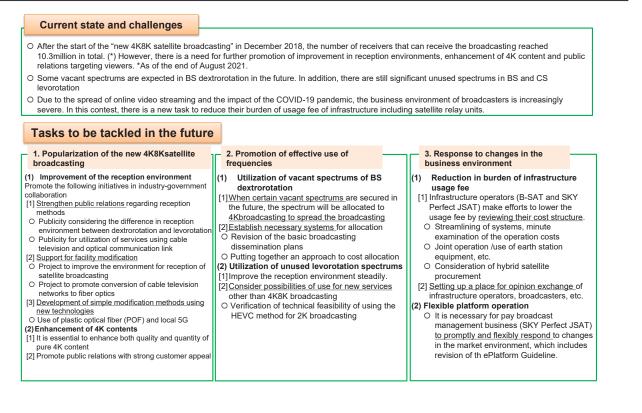
- Broadband penetration and growth of video streaming services Shrinking TV audiences, and expansion of information space
- Shrinking IV audiences, and expansion beyond broadcasting
- Accelerated population decline

#### Significance and role of broadcasting in the digital age

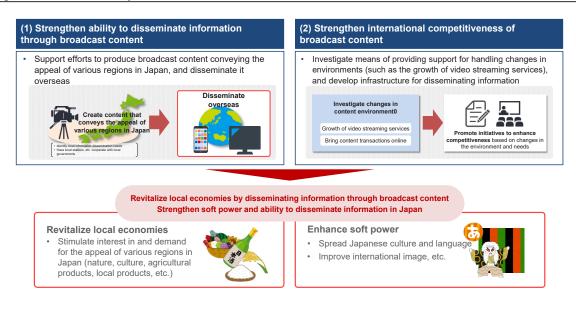
- Sharing of basic social information such as disaster information and community information
- Reliable spread of information backed by coverage and editing
- Ensuring information health in information spaces



# 2. Summary of the report by the Working Group on the Future Image of Satellite Broadcasting (Figure 5-4-4-1 in White Paper)



3. Promotion of the overseas expansion of broadcast content (Figure 5-4-5-1 in White Paper)



4. Project to enhance the disaster resistance through conversion of cable televisions to fiber optics toward establishment of 'New Normal' (Figure 5-4-7-1 in White Paper)

#### **Project illustration**

#### O Project operator

Municipalities, municipality collaboration entities or a third sector (including entities that continue to fulfill the role pertaining to the provision of cable television services through transfer of the relevant facilities from these entities(Succeeding business operators))

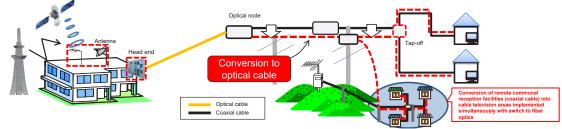
#### OTarget regions

- Regions satisfying all of (1) to (3) below: (1) Municipalities where cable television is positioned in their regional disaster prevention plan
- (2) Regions with unfavorable conditions(3) Municipalities with financial index 0.5 or lower and other regions where the subsidy is found particularly necessary

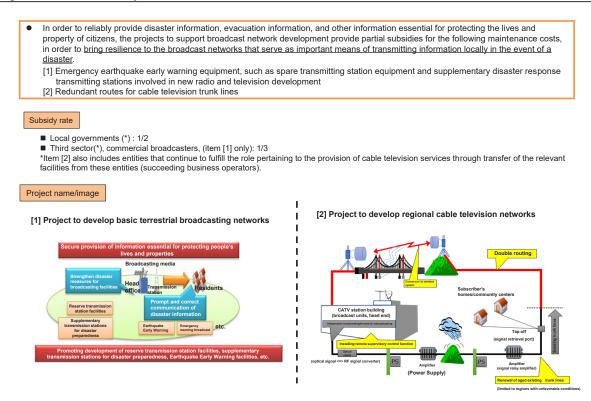
#### OSubsidy rate

- (1) Municipalities or municipality collaboration entities (Succeeding business operators): 1/2
- (2) Third sector (Succeeding business operators): 1/3 OSubsidized costs (shown in red in the figure below)

Optical fiber cable, transmitting/receiving facilities, antennas, etc. \*Includes transmission line equipment necessary for converting remote communal reception facilities (coaxial cable) into cable television areas implemented simultaneously with the switch to fiber optics (expanded from the R4 supplementary budget).

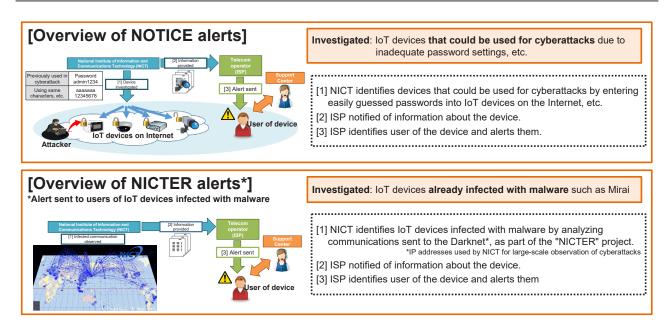


# 5. Projects to support broadcast network development (Figure 5-4-7-2 in White Paper)

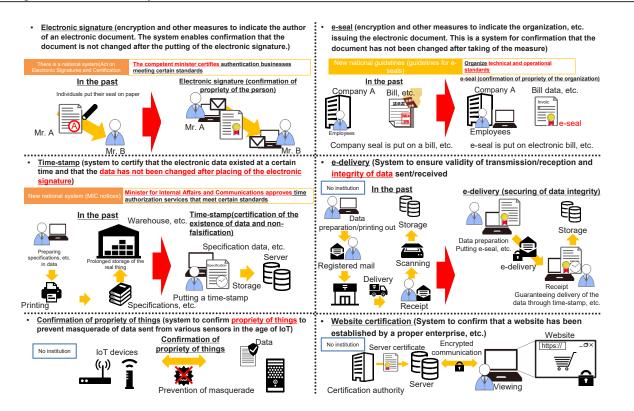


## Section 5

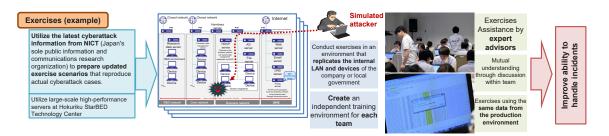
1. Overview of NOTICE and NICTER alerts



### 2. Trust services (Figure5-5-2-1 in White Paper)



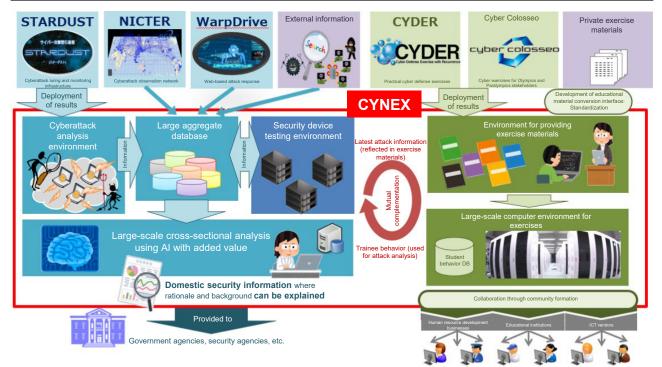
3. Practical cyber defense exercises (CYDER: CYber Defense Exercise with Recurrence) (Figure5-5-3-1 in White Paper)



### 4. CYDER in fiscal 2022 (Figure5-5-3-2 in White Paper)

Course	Type of exercise	Level	Intended audience (topics covered)	Intended organizations	Location	Frequency	Period
A	Group	Beginner	Individuals just beginning to work with systems (Procedure for responding to incidents)	All organizations	All prefectures, etc. *On-site and satellite lessons are also being tried	72 times	From July, to Feb. of the following year
B-1		Intermediat	System administrators and operators (Autonomous incident response and security management)	Local governments	11 regions nationwide	20 times	From Oct., to Jan. of the following year
B-2				Organizations other than local governments	Tokyo, Osaka, Nagoya, Tsukuba	13 times	Jan. to Feb. of the following year
С		Semi- advanced	Security specialists (Advanced security technology)	All organizations	Tokyo	3 times	From Oct., to Feb. of the following year
Online Standard	Opline	Equivalent to beginner	Individuals just beginning to work with	All organizations	(Participant workplaces, etc.)	As needed	5/24 to 7/19
Online Introduction	Online exercises	Introduction	systems (Procedure for responding to incidents)				1/17 to 2/24 of the following year

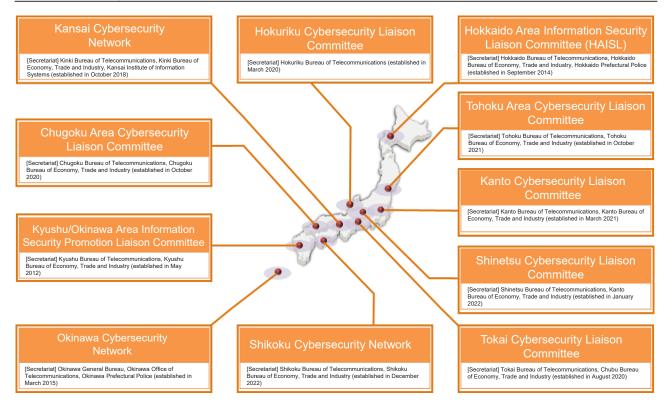
### 5. Integrated cybersecurity knowledge/human resource development platform (CYNEX)



#### 6. Demonstration project for the collection and analysis of cybersecurity information using government device information (CYXROSS)

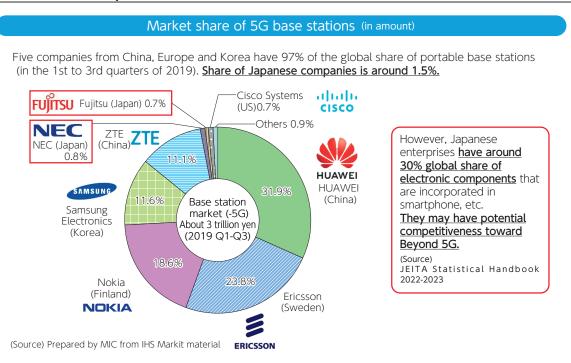
Introduction of safe and transparent verifiable sensors (software) in government devices	]			
Theft ⇒ Destruction ⇒ ↓ ↓ ↓ ↓ ↓ ↓ ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓  ↓	Aggregate collected information in CYNEX • Sample information	National Institute of Information		NICTER
Falsification	<ul> <li>Alert information</li> <li>Device information, etc.</li> </ul>	and Communications Technology		Cyberattack observation technology
Theft				9416-2008188 STRRDUST (23-724)
Falsification		Integrated cybersecurity knowledge/human resource development platform	Utilize cybersecurity technology developed by NICT	, Targeted attack observation and analysis technology
Theft Destruction	Provide analysis results to ministries and agencies • Sample analysis results • Attack trend statistical inform	Information analysis	and accumulated data	
	Cyberthreat information (IoC)	, etc.		Cyber attack information integration analysis technology

### 7. Regional security communities



## Section 7

1. International competitiveness in the communications infrastructure market (Figure 5-7-2-1 in White Paper)

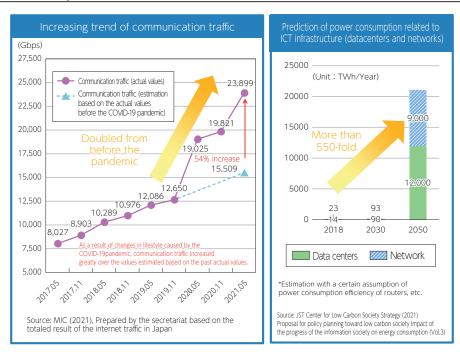


# 2. Beyond 5G (6G) R&D by the governments of other countries (Figure5-7-2-2 in White Paper)

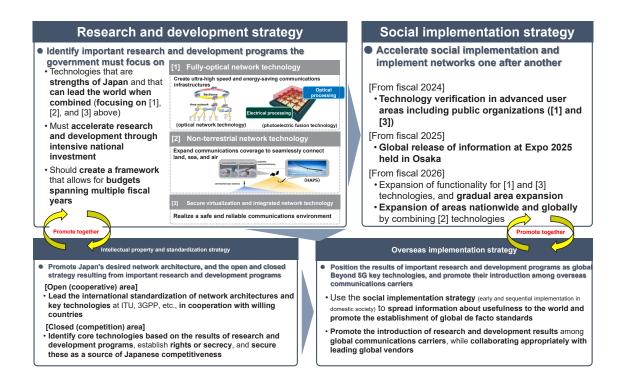
The United States	The "CHIPS and Science Act of 2022," which provides \$52.7 billion (about 7 trillion yen) in support for the production and research and development of semiconductors and \$20 billion (about 3 trillion yen) in support for the development of AI, quantum computers, and advanced technologies such as next-generation communication standards (6G), was enacted (August 2022)
Europa	EU, Germany and Finland governments invest 1.85 billion Euro (about 240 billion yen) in total in 6G R&D (as of March
Europe	2022)
EU	<ul> <li>EU decided <u>900 million Euro investment in 6G R&amp;D in the next R&amp;D program Horizon Europe</u> (2021-2027) (March 2021)</li> <li>SNS JU secured 2 billion euros (about 260 billion yen) in total from the public and private sectors, including the above 900 million euros (March 2022)</li> </ul>
Germany	●Decided to invest 700 million Euro in total in 6G technology R&D (2021 to 2025) (April 2021).
Finland	• Started 6Genesis Flagship Program and budgeted 250 million Euro (about 33 billion yen) in eight years from 2019 to 2026 (May 2018)
Russia	The Skolkovo Foundation announced a project to develop Russian 6G communications devices at the Skolkovo Institute of Science and Technology (Skoltech) and the Radio Research and Development Institute (NIIR), with an investment of <b>30 billion rubles (approximately 64.4 billion yen) from 2023 to 2025</b> (July 2022)
China	• Released a digital economy plan to enhance 6G R&D as part of the 14 th five-year plan (January 2022)
Korea	Ministry of Science and ICT (MSIT) <u>announced a 6G R&amp;D action plan</u> , including <u>220 billion won (about 21 billion yen)investment by 2025</u> (June 2021).

\* The exchange rate at the time of publication was used for yen conversion.

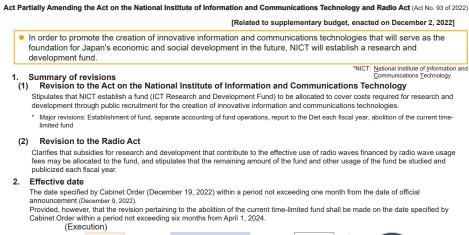
3. Trends of communications traffic and energy consumption in the ICT field (Figure 5-7-2-3 in White Paper)



# 4. Strategy to accelerate research and development and social implementation of Beyond 5G (6G) (Figure 5-7-2-4 in White Paper)

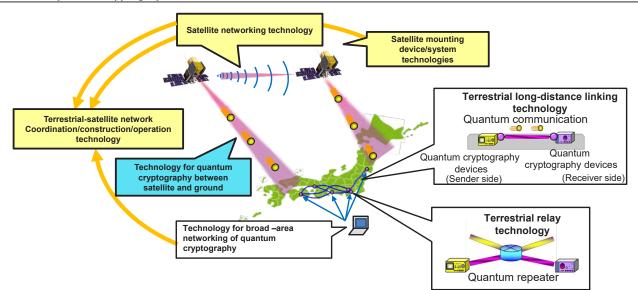


## 5. Act Partially Amending the Act on the National Institute of Information and Communications Technology and Radio Act (Figure 5-7-2-5 in White Paper)

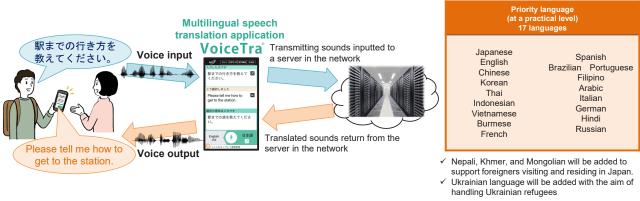




#### 6. Global quantum cryptographic communications network



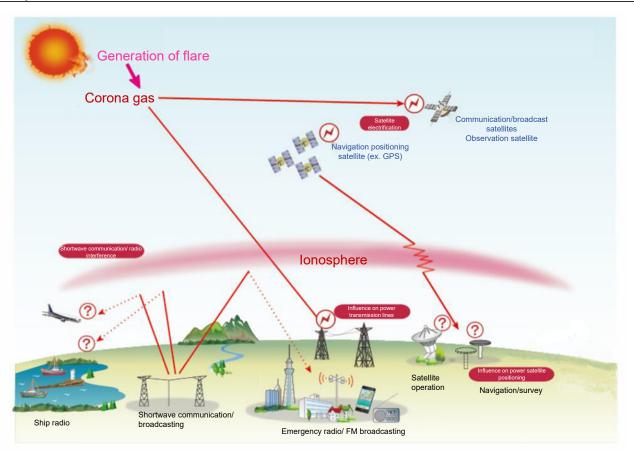
### 7. Multilingual translation technology



### 8. Efforts to further advance multilingual translation technology

Mission	Eliminate language barriers in the world —Evolution from "serial translation" to "simultaneous interpretation" and further progress in social implementation—				
Vision	<ol> <li>Realize global and stress-free exchange</li> <li>Further advance multilingual translation technology and its social implementation to eliminate "language barriers" in the world and realize a society where everybody freely exchanges with people around the world.</li> <li>Strengthen business capabilities and realize a true convivial society</li> <li>Akak Al capable of simultaneous interpretation at international conferences and business discussions to expand business opportunities of enterprises and promote overseas collaborations, etc.</li> <li>Eliminate language barriers in exchange with and daily life of foreigners visiting or staying in Japan who are expected to in crease across the country including rural areas.</li> <li>Enhance Japan's presence</li> <li>Toward EXPO Osaka, Kansai in 2025, realize multilingual real -time talks and simultaneous interpretation between exhibitors and visitors of pavilions and lectures.</li> <li>Offer "Omotenashi" to people gathering from around the world to increase value and appeal of Japan in economic/social activities at home and abroad.</li> </ol>				
Target	2020 Translation to support daily life and business (Conversation Level) 2025 Simultaneous translation that considers context, intention of the speaker, etc. (Discussion Level) - Highly accurate, prompt and practical simultaneous interpretation that considers the context (flow of conversation/sentence), intention of the speaker, surrounding conditions, cultural background and other factors - Expand the priority languages for the multilingual translation technology based on the "Comprehensive Measures for Acceptance and Coexistence of Foreign Nationals" 2030 Simultaneous interpretation capable of severe negotiations (Negotiation Level)				
Action	Share a roadmap to achieve the goals toward 2025 and promote specific actions in an industry-academia-government cooperation.         Project 1       Research and development of innovative multilingual translation technology for simultaneous interpretation by Al         Project 2       Develop the world's top level Al research base to support advanced natural language processing technology.         Project 3       Social implementation of simultaneous interpretation system toward 2025 EXPO in Japan				

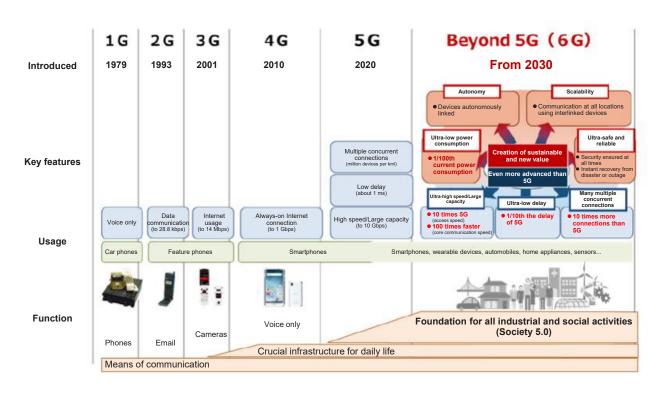
### 9. Impact of solar flares on the Earth



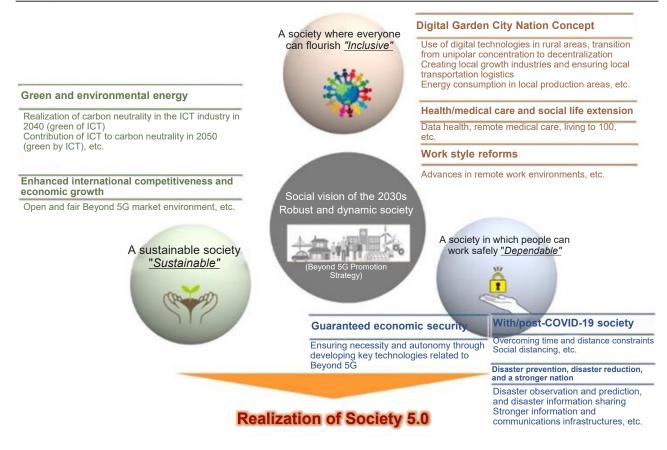
(Source) MIC, Material of the Study Group on the Advancement of Space Weather Forecasting (the 1st session)

## **Policy Focus -2**

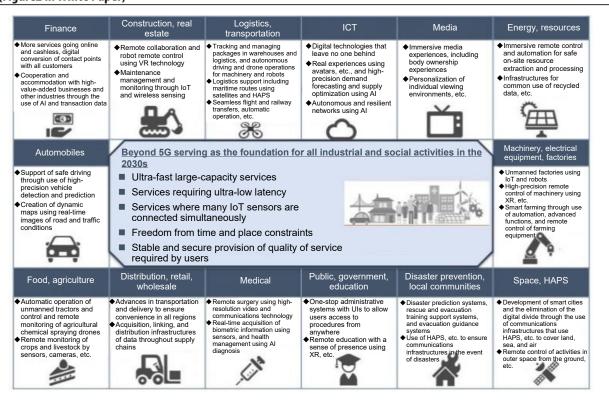
### 1. Beyond 5G (6G) features



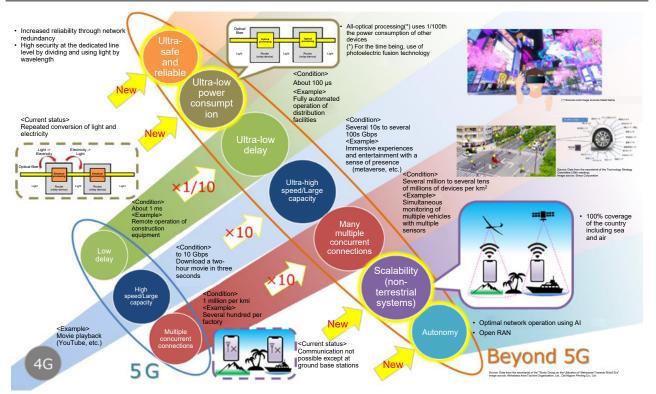
# 2. Society of the 2030s realized through Beyond 5G (6G) (Figure 1 in White Paper)



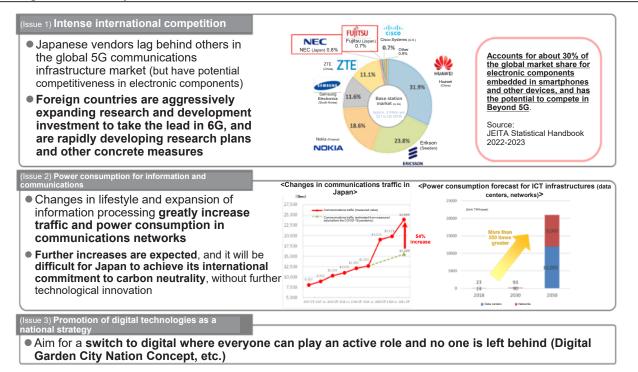
# 3. Beyond 5G (6G) use cases (Figure2 in White Paper)



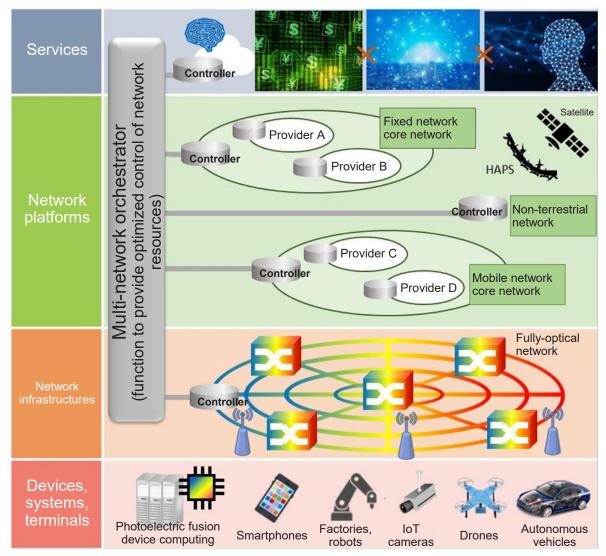
4. Features and use scenes realized by Beyond 5G (6G) (Figure3 in White Paper)



# 5. Major challenges for Beyond 5G (6G) (Figure4 in White Paper)

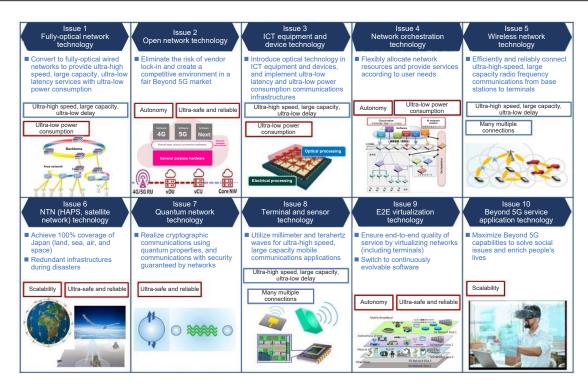


### 6. The ideal Beyond 5G (6G) network

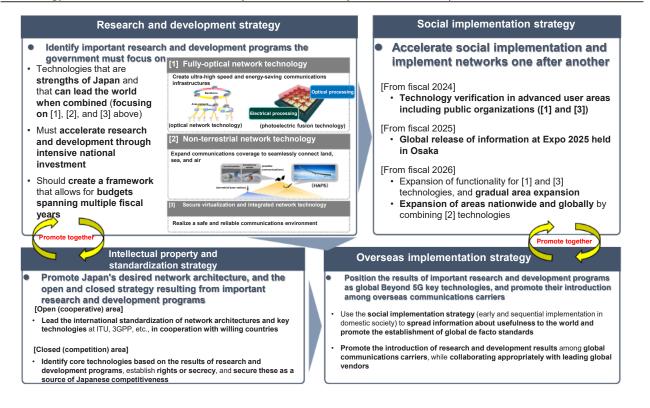


(Source) Information and Communications Council, Summary of the interim report on the "Information and Communications Technology Strategy for Beyond 5G"

7. 10 Beyond 5G (6G) research and development issues for industry, academia, and government (Figure5 in White Paper)

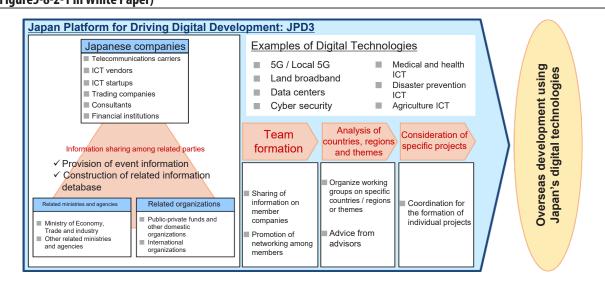


#### 8. Strategy to accelerate research and development and social implementation of Beyond 5G (6G)

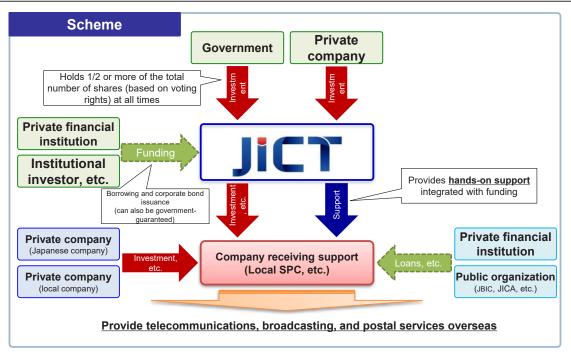


## Section 8

1. Japan Platform for Driving Digital Development (Figure 5-8-2-1 in White Paper)

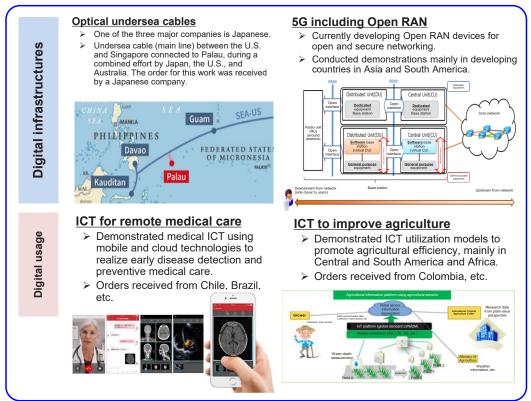


2. Support through the Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (JICT) (Figure 5-8-2-2 in White Paper)

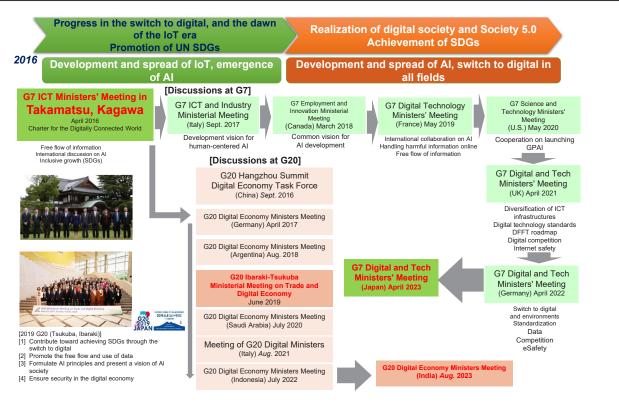


# 3. Examples of overseas implementation of ICT (Figure 5-8-2-3 in White Paper)

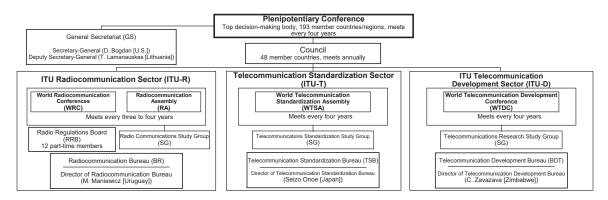
#### **Specific cases**



#### 4. History of G7/G20 ICT/digital discussions (overview) (Figure 5-8-5-1 in White Paper)



# 5. International Telecommunication Union (ITU) organization (Figure 5-8-5-2 in White Paper)



6. Global Digital Connectivity Partnership (GDCP) (Figure 5-8-6-1 in White Paper)

### GDCP concept

Toward secure connectivity and vibrant digital economies with cooperation of Japan and the United States, GDCP promotes: [1] cooperation in third countries, [2] multilateral collaboration and [3] bilateral collaboration with a view to global development (especially 5G and Beyond 5G)

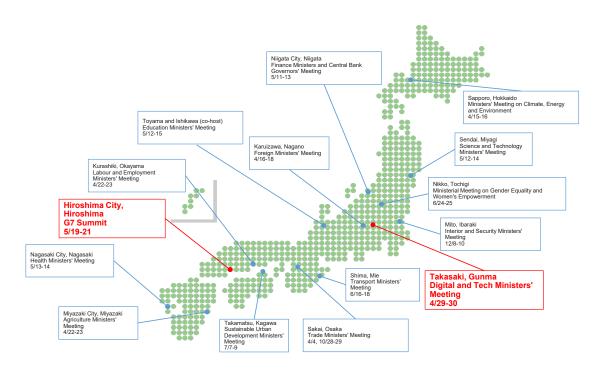
 
 Cooperation in third countries
 Cooperation for ICT infrastructure development and human resource development in third countries (with focus on the Indo-Pacific, but including other regions)

 Multilateral collaboration
 Enhanced collaboration in multilateral frameworks including ITU, G7/G20, OECD and APEC

#### Bilateral collaboration Investments in R&D environments for 5G and Beyond5G (6G)

## **Policy Focus -3**

1. G7 Summit and related ministerial meetings (Figure 1 in White Paper)

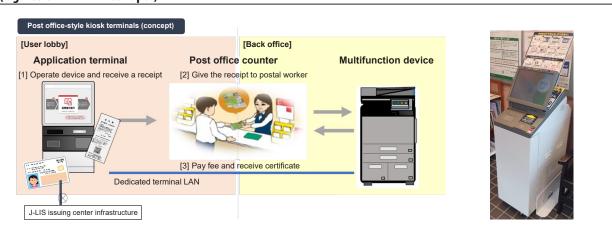


2. G7 Digital and Tech Ministers' Meeting in Takasaki, Gunma (Figure2 in White Paper)

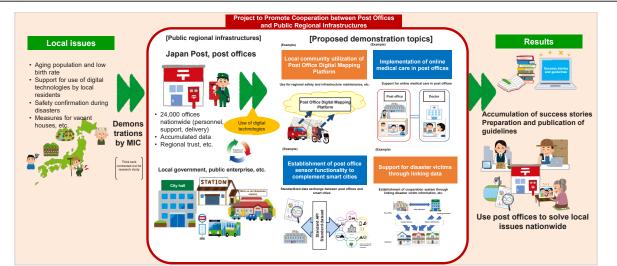


## Section 9

1. Post office-style kiosk terminal (Figure5-9-2-1 in White Paper)



2. Project to Promote Cooperation between Post Offices and Public Regional Infrastructures (Figure 5-9-2-2 in White Paper)



Linking Individual Number Cards and transportation-related IC cards at post offices (Maebashi, Gunma) Public use of post office drones in hilly and mountainous areas (trial delivery of emergency relief supplies during disaster) (Kumano, Mie)



Shopping services at post office counters (Yatsushiro, Kumamoto)



(Source) Lower center image: Created by ACSL Ltd. with Google Earth (Map data © 2022 Google)