Public Debate on the Future Spectrum Management Policy in Japan

Is Japan changing course in spectrum awards?

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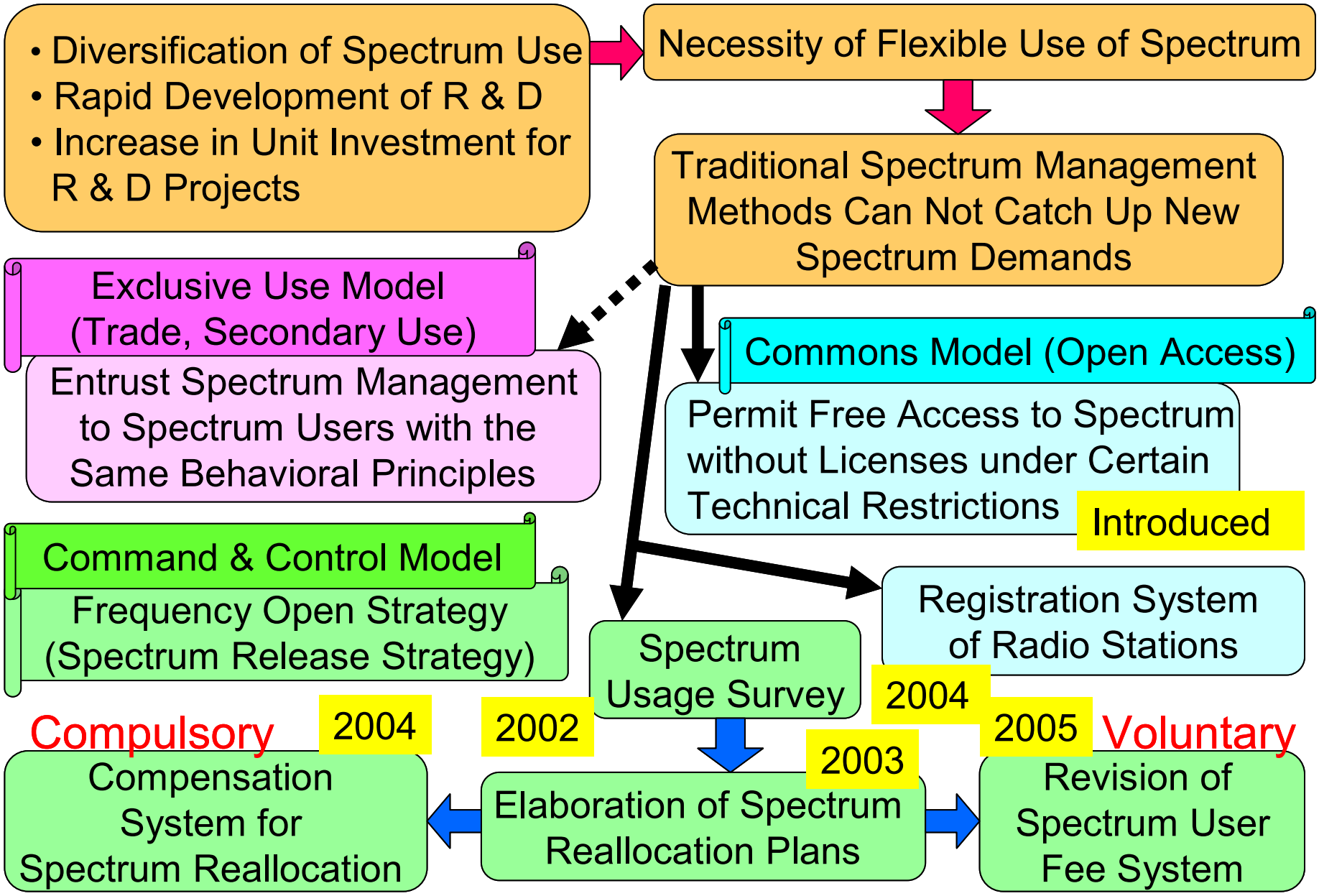
1. Evolution of Spectrum Management Policy in Japan



2. Characteristics of Spectrum Management Policy in Japan

- Spectrum Assignment System
  - Spectrum Auctions have not been introduced yet, although draft laws have been submitted in 2003*, 2004*, 2012*(Government), 2013*, 2014*, 2016, and 2017, especially by the Democratic Party(*).
  - Traditionally, the Democratic Party has initiated to introduce spectrum auctions, while the Liberal Democratic Party is prudent to apply auctions to spectrum licenses.
  - However, the Council for Regulatory Reform under the Cabinet Office, starting in September 2016, is positive about spectrum auctions with the intention of assuring transparency of assignment processes.
  - The Ministry of Internal affairs and Communications (MIC) takes a prudent position about pure auctions, although it has several views for/against auctions and already introduced certain consideration of economic elements.
- Spectrum User Fee System (http://www.tele.soumu.go.jp/e/index.htm)
  - Spectrum User Fee System was introduced in 1993 as a tool to recover administrative costs concerning spectrum management.
  - This system was drastically changed in 2005. The economic value of bands of frequency has been considered in the fee system and purposes of the fee collection are gradually extended including the refarming, while its basic characteristics have not been changed (Total Amount = Total Costs).

3. Public Debate on Spectrum Management Policy in Japan

- Two Major Actors
  - Effective Use of Spectrum and Growth Strategy Panel (Under the Ministry of Internal affairs and Communications [MIC]) , November 2017 -

    Chairman: Emeritus Prof. Kazuteru TAGAYA

    ✓ Final Report of the Effective Use of Spectrum and Growth Strategy Panel (August 31, 2018) : Spectrum Management Policy

    http://www.soumu.go.jp/main_content/000572077.pdf (Japanese)
  - Council for Regulatory Reform (Under the Cabinet Office), September 2016 -

    Chairman: Prof. Hiroko OTA; Chairman of Investment WG: Mr. Eiji HARA

    ✓ Third Report by the Council for Promotion of Regulatory Reform -For New Era to Come- (June 4, 2018): Broadcasting

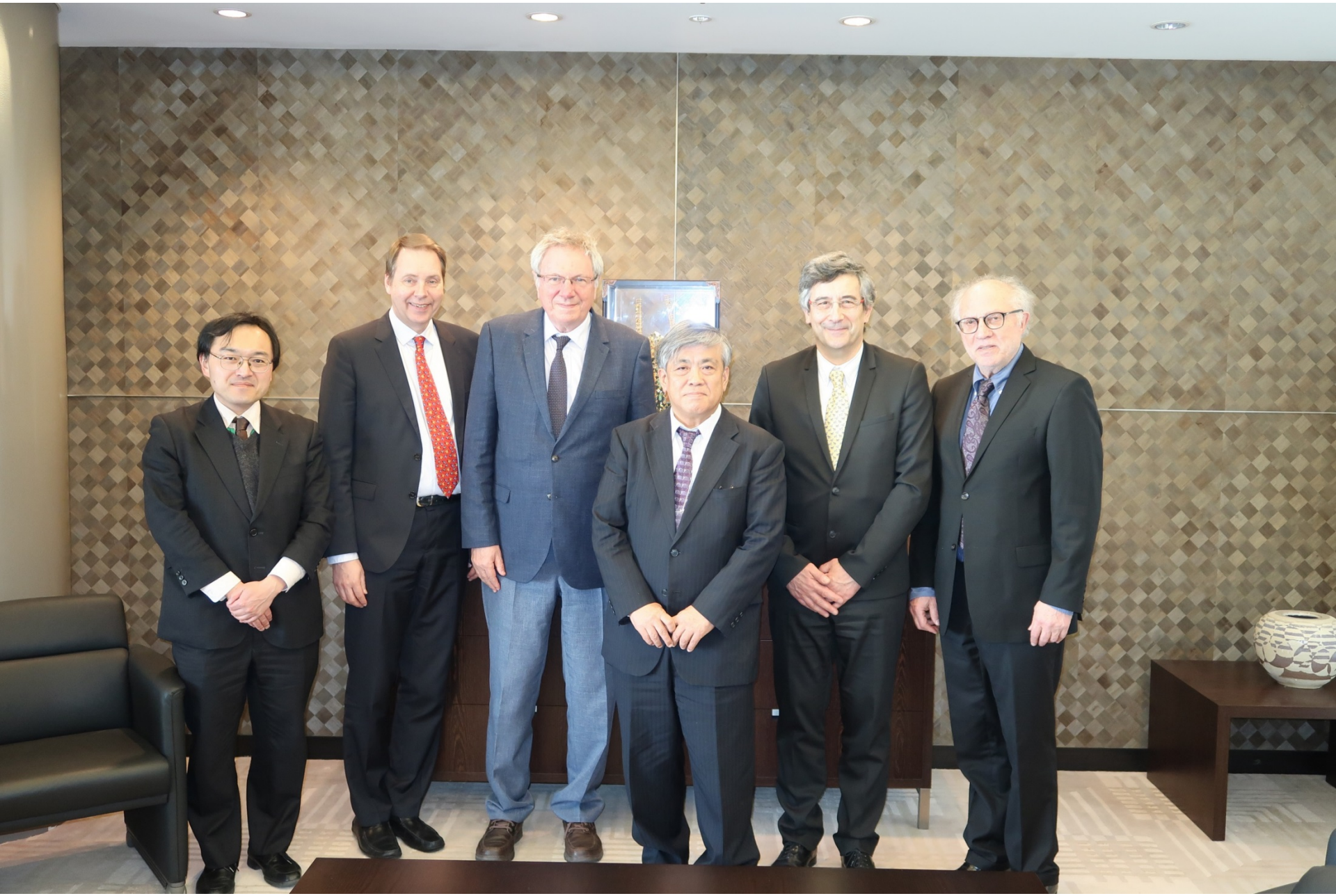
    http://www8.cao.go.jp/kisei-kaikaku/english/pdf/180604/toshin3.pdf

    ✓ Second Report by the Council for Promotion of Regulatory Reform (November 29, 2017): Spectrum Management Policy

    http://www8.cao.go.jp/kisei-kaikaku/english/pdf/171129/toshin2.pdf

    ✓ First Report by the Council for Promotion of Regulatory Reform - Opening the Door to Tomorrow – (May 23, 2017): Spectrum Management Policy

    http://www8.cao.go.jp/kisei-kaikaku/english/pdf/170523/item1.pdf



With Prof. Tagaya (Tokyo, March 28, 2018)


Mr. Hara in the Symposium
Workshop and Symposium (Sagami Women's University, March 25-26, 2018)

4. Final Report of the Panel under the MIC (1)

- Next Generation Wireless System in 2030s
  1. Beyond 5G System (Super-large capacity x Super large volume x Super-low latency)
  2. Wireless IoT System
  3. Next Generation Mobility System
  4. Wireless Power Transmission System
  5. Next Generation Satellite Use System
  6. Next Audiovisual/Terminal System
  7. Public Safety LTE

Market Size in the Wireless and Related Industries in 2040:
112 trillion yen
= 1 trillion US $

- Six Social Issues/Social Effects of the Wireless Society in 2030s
  1. Wellness (medical care, nursing, health): 20% reduction of medical bills
  2. Mobility (logistics, transport): reduction by 2 billion person-hours of traffic congestion loss
  3. Security (disaster prevention, safe and secure): 50% reduction of human and economic damage occurred by disaster
  4. Life (labor, consumption, education): 20% reduction of food loss
  5. Urbain (city, community): reduction by 830 million hours of commuter time
  6. Industry: increase in productivity in manufacture to the top level among OECD countries

5. Final Report of the Panel under the MIC (2)

- Spectrum Refarming and Reallocation Plan
  1. Japan will assure 2.5 GHz bandwidth for the '5G' by 2020, and 4 GHz bandwidth including for mobile phone and the IoT by March 2021.
  2. 110 GHz bandwidth will be required for the 7 Next Generation Wireless Systems and Japan may prepare 29GHz bandwidth on the sharing-basis by 2040 by reallocating, refarming and newly farming.
- Methods for Effective Use of Spectrum
  1. Revision of spectrum assignment system
     - Ministerial examination of operators' plans for effective spectrum use after the license terms: Effective use or Return
     - Incentive for the frequency migration
     - Drastic revision of assignment method: Counting operators' economic contribution for realization of the 'Society 5.0' as an element in the licensing criteria
     - Surplus from the assignment process will be appropriated for the costs of works for the 'Society 5.0'
     - No needs and positive opinions for secondary trading of spectrum
     - Spectrum assignment on the sharing-basis: Construction of real-time database, and establish of a coordinating body

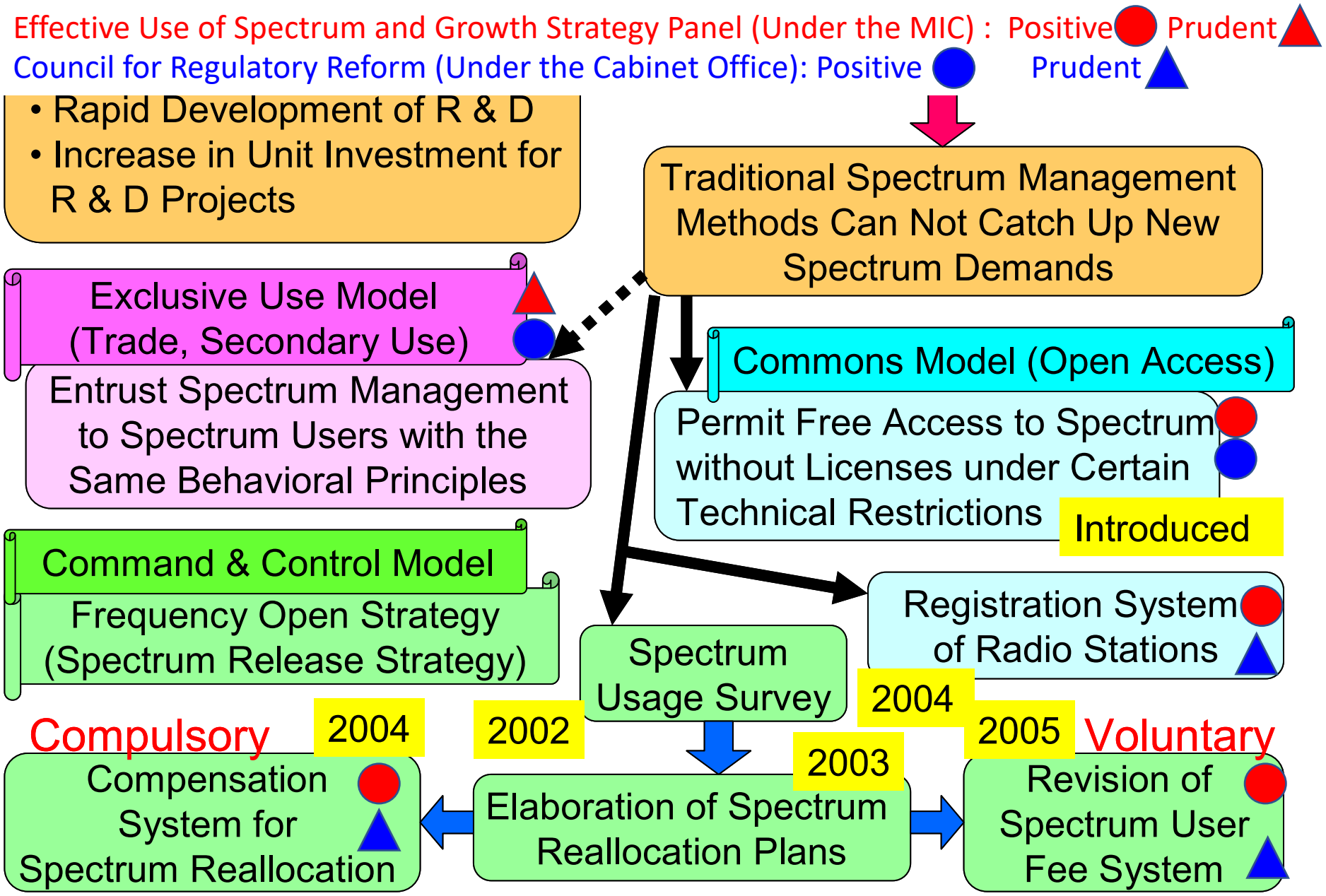
6. Final Report of the Panel under the MIC (3)

2. Effective Use of Spectrum Assigned for Public Bodies
   - Publication of database on wireless stations for public purposes
   - Elaboration of new criteria to evaluate the degree of effective use
   - Introduction of the PS-LTE (in 200MHz band [band for public broadband] or others) and of system/spectrum sharing among public users
3. Revision of the Spectrum User Fee System
   - Appropriating the revenue to the costs of the new political purposes (ex. frequency migration, construction of optical fiber networks for the '5G,' …), while keeping the principle of expenditure of the fee
   - Revision of burden of the fee (especially between broadcastors and mobile operators) and of the fee grouping (- 3GHz, 3-6GHz and 6GHz - → - 470MHz, 470MHz-3.6GHz, 3.6GHz-6GHz and 6GHz -)
   - Collection of the fee from ineffective public users
   - Extension of license-exempted bands under the registration system
4. Method for Effective Use of Spectrum according with Technological Evolution
   - Mechanism design for wireless power transmission system
   - Evaluation and revision of the local broadband wireless access (BWA)
   - Decision of users in the VHF High band (anciently for the Analog TV)

7. Difference of Views between the Panel and the Council

	Panel (MIC)	Council (Cabinet Office)
Publication of database on public wireless stations	Only limited items (5 elements)	More items should be published
Compulsory return of spectrum	Applied to only mobile operators	Applied to all users
Methods of incentive for the frequency migration	Adequate	Inadequate
Revision of spectrum assignment method (counting the contribution of new users) and Introduction of secondary trading	No needs and positive opinions for secondary trading from spectrum users.	The proposed method is not reflected by the economic value adequately. Inadequate research for the secondary trading.
License-exempted bands	To keep appropri-ate environment, registration is needed in some cases	More prepared. The bands should be used without registration or notification.
Spectrum user fee system		The fee system should be designed with assignment method

8. Deference of Views between Two Actors



9. Future Needs of Spectrum for the 5G Services (1)

"Research on future uses of the '5G,'" published on the 28th Sep. 2018
by the Ministry of Internal affairs and Telecommunications, Japan
http://www.soumu.go.jp/menu_news/s-news/01kiban14_02000350.html

National Operators	NTT DoCoMo	KDDI Group	Softbank	Rakuten Mobile
Requested bands and bandwidth	3.7GHz: 100MHz x N 4.5GHz: 100MHz x N 28GHz: 400MHz x N	3.7GHz: > 100MHz 4.5GHz: > 100MHz 28GHz: > 400MHz	3.7GHz: 100MHz 4.5GHz: 100MHz 28GHz: 300-400MHz	3.7GHz: 100MHz 4.5GHz: 100MHz 28GHz: 800MHz
Deployment	National wide	3.7GHz and 4.5GHz: Main cities and Inbound touristic areas 28GHz: High traffic areas	3.7GHz and 4.5GHz: Widely covering as super high speed services 28GHz: Spot services according to traffic volume	National wide 28GHz: Spot services in all municipalities

Notes:

- Cable TV operators and local BWA operators have also similar needs for the bands and bandwidth for the '5G.'
- The MIC is waiting public propositions including individuals about uses of the '5G' network by end of November (https://5g-contest.jp/), and will permit several trails in 2019.

10. Future Needs of Spectrum for the 5G Services (2)

"Research on future uses of the '5G,'" published on the 28th Sep. 2018
by the Ministry of Internal affairs and Telecommunications, Japan
http://www.soumu.go.jp/menu_news/s-news/01kiban14_02000350.html

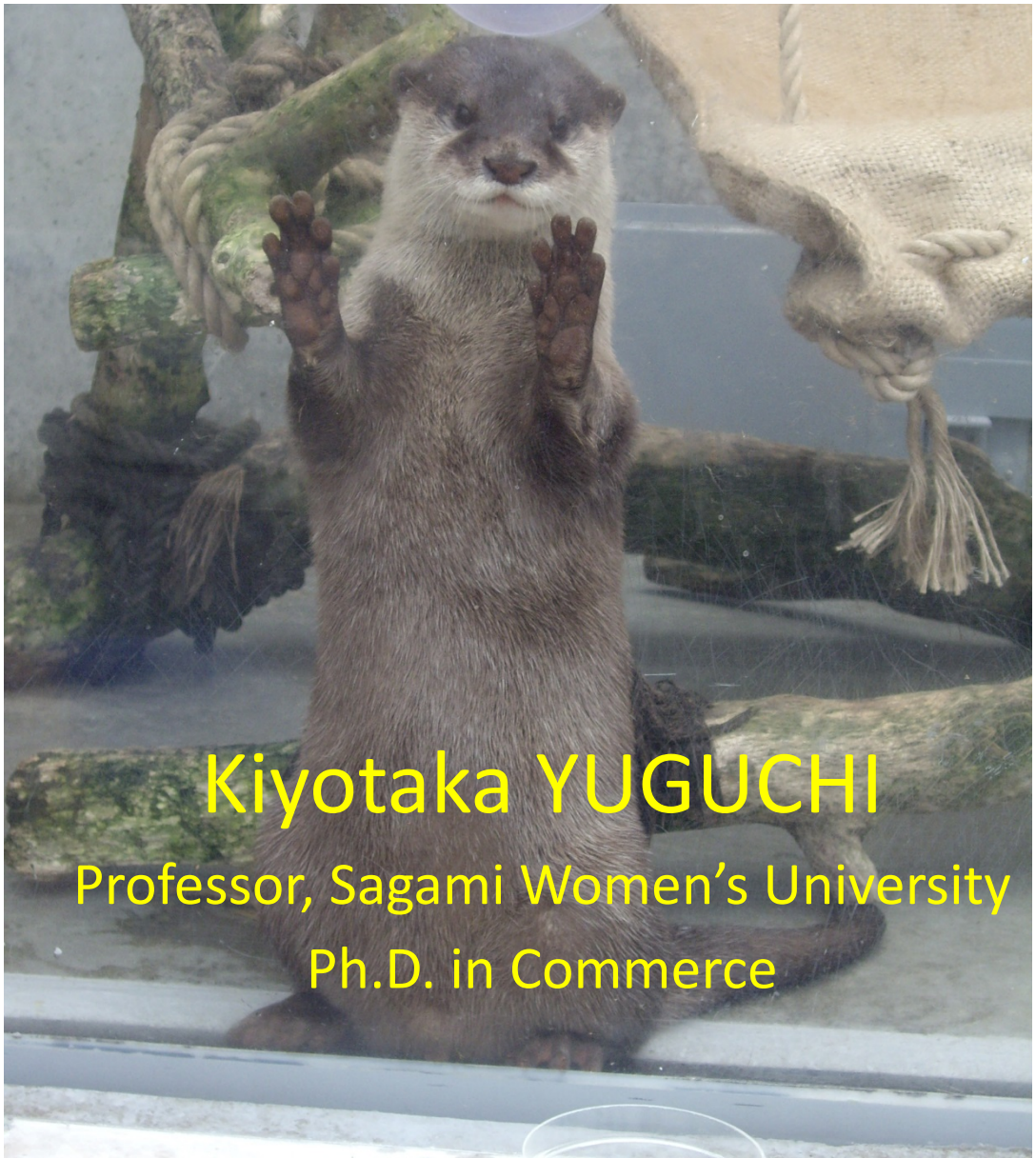
National Operators	NTT DoCoMo	KDDI Group	Softbank	Rakuten Mobile (New Entrant)
Appropriate evaluation criteria for licensing	1) Competence for speedy deployment 2) Number of base stations operated in certain period after licensing	1) Deployment plan assuring the 5G services in not only dense areas but also necessary rural areas 2) Geographical coverage rate (Not population coverage rate)	1) Adoption rate of the 5G element technology into the commercial networks 2) Capacity factor of the whole network or Volume of traffic per subscriber 3) Coverage rate other than the population	1) Population coverage rate (3.7GHz & 4.5GHz) and Number of municipalities provided of the 5G services or Pop. coverage rate of the 5G as a whole (28GHz) 2) Financial and technological competence 3) Payment for the cost of spectrum clearance (3.7GHz)

Note: Rakuten Mobile is actually a MVNO and has recently been licensed as a MNO.

11. Issues of the Mechanism Design

- A variety of needs exists for the “5G.”
  - Heavy data traffic such as super high-defined audiovisual (4K, 8K)
  - Low latency transmission such as drones, autonomous driving vehicles
  - Broad coverage such as censoring, business radio for taxis
  - High speed moving such as vehicles, high-speed rails and airplanes
- Trade-off between investment and licensing system
- Needs for spectrum and equipment sharing
  - Revision of pure auctions with minimum restrictions for spectrum use
  - Mechanism design for spectrum auctions on the sharing basis may be difficult due to increase of uncertainty of transmission and incentive compatibility among users.

Thank you for your attention!



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