



Policy
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Space Policy & Governance in Japan

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- Japan's space policy and governance: Overview
- Promoting space application
- Enhancing international competitiveness of Japan's space industry
- International space cooperation

Japan's Space Policy: An Overview (1)

Basic Space Law (2008) : Turning point of Japan's space policy:

From R&D-oriented space activities to space utilization

Basic objectives of space activities

- Improving the daily lives of Japanese citizens
- Strengthening national security
- Ensuring international peace
- Encouraging Japan's space industry
- Fostering socioeconomic development
- Promoting international cooperation and space diplomacy
- Advancing scientific research and technological capabilities

Japan's Space Policy: An Overview (2)

Basic Plan on Space Policy (2013)

Two Basic Goals of Space Policy

1. Expanding space utilization

- To create new services and products for improving the quality of everyday life on the earth, such as weather forecasting, communication/broadcasting, and navigation etc.
(→space systems as social infrastructure)
- Space technology can offer effective measures for disaster management
- Ensuring national security

2. Ensuring the capability of autonomous space activities

- To maintain and advance technological capabilities for space activities
- To enhance international competitiveness of Japan's space industry

Japan's Space Policy: An Overview (3)

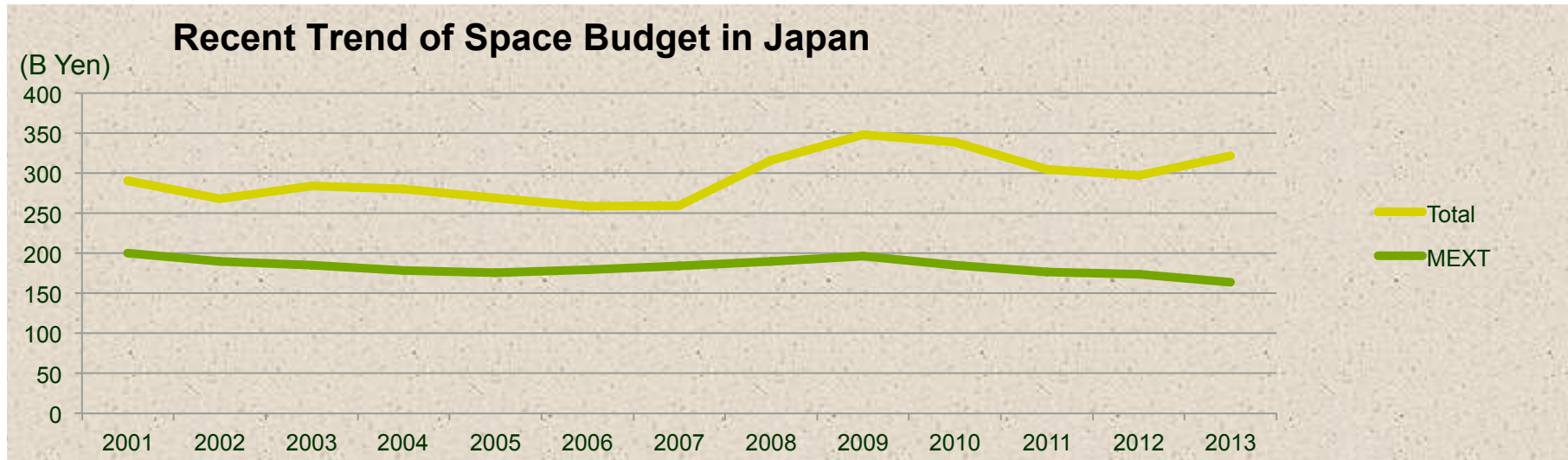
New Basic Plan on Space Policy is now under discussion.

Draft Proposal of Basic Plan on Space Activities (November, 2014)

Objectives of Space Policy

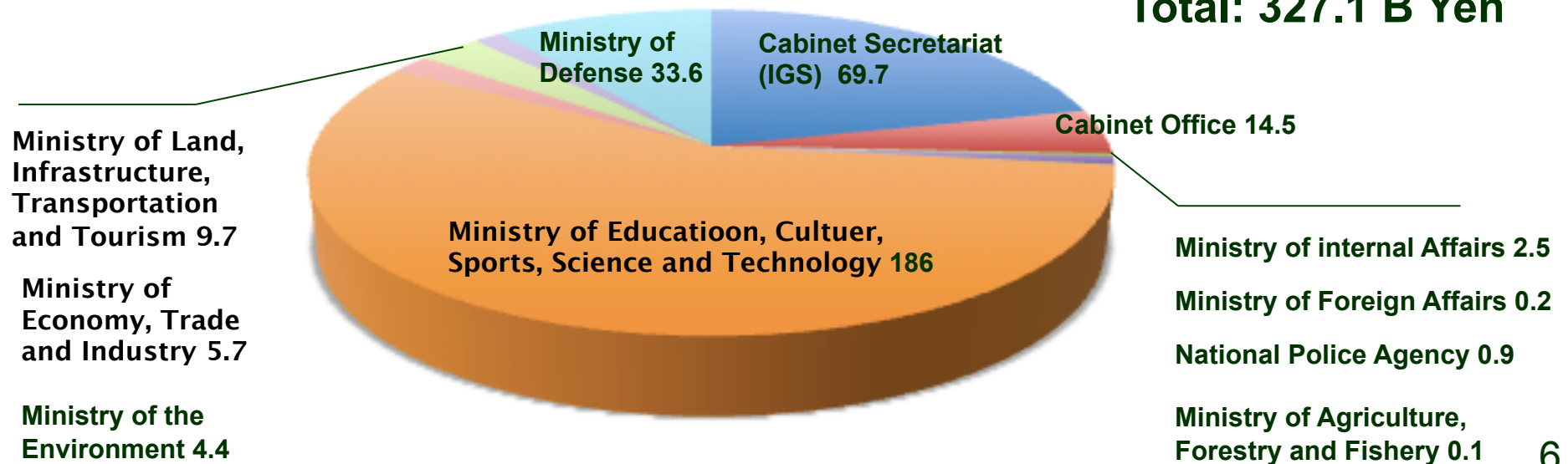
- **Promoting space security - too much dependence on security as use?**
 - Ensuring stability of space activities
 - Promoting space utilization for security purposes
 - Strengthening US-Japan alliance through space cooperation
- **Expanding space utilization**
 - Addressing global challenges by using space
 - Realizing safe and secure society
 - Creating innovation and new markets
- **Maintaining and enhancing space industry and science and technology**
 - Strengthening industrial base to maintain autonomous space capability
 - Maintaining and advancing sophisticated science and technology

Space Budget in Japan

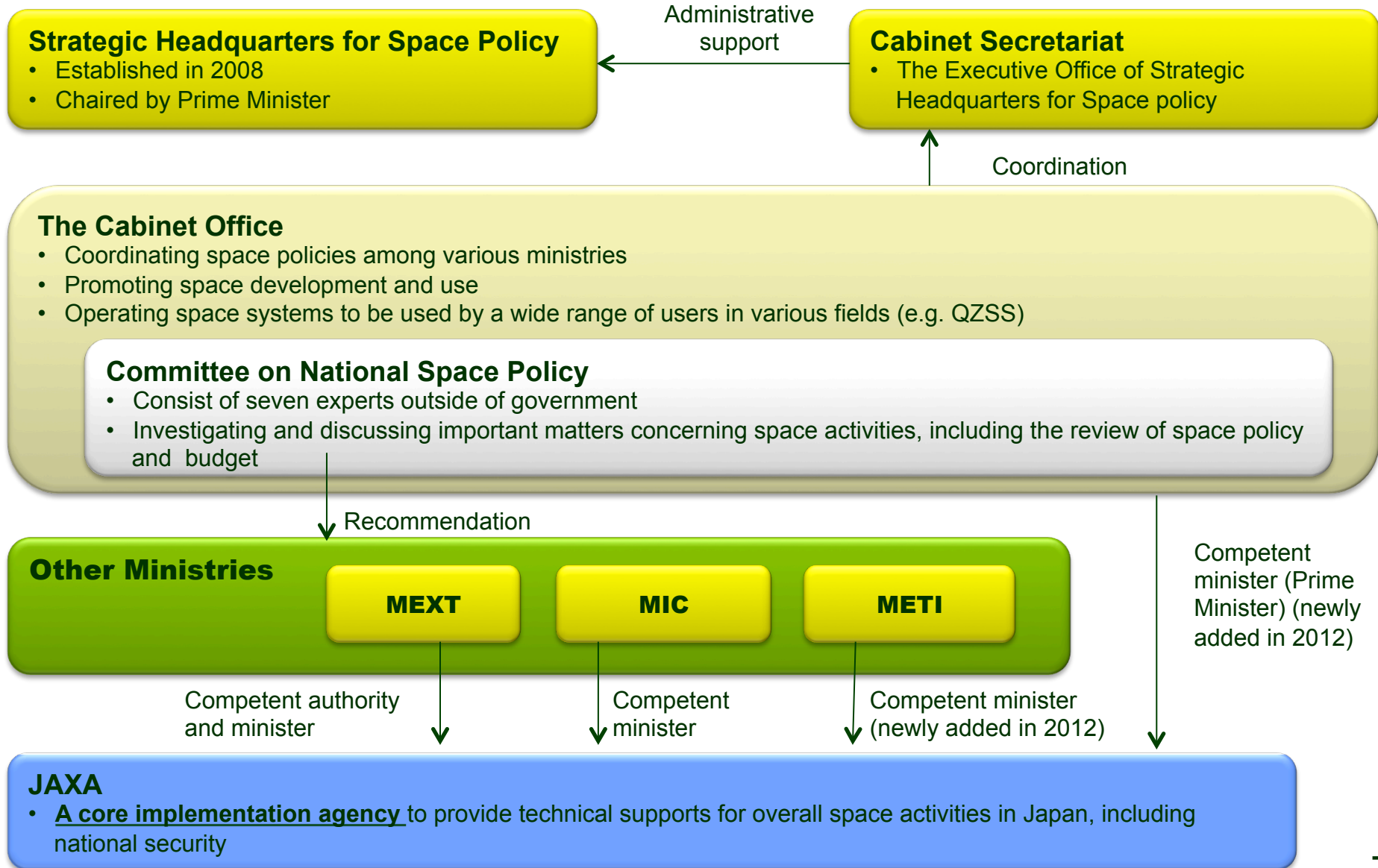


Space Budget Request for FY 2015 (B yen)

Total: 327.1 B Yen

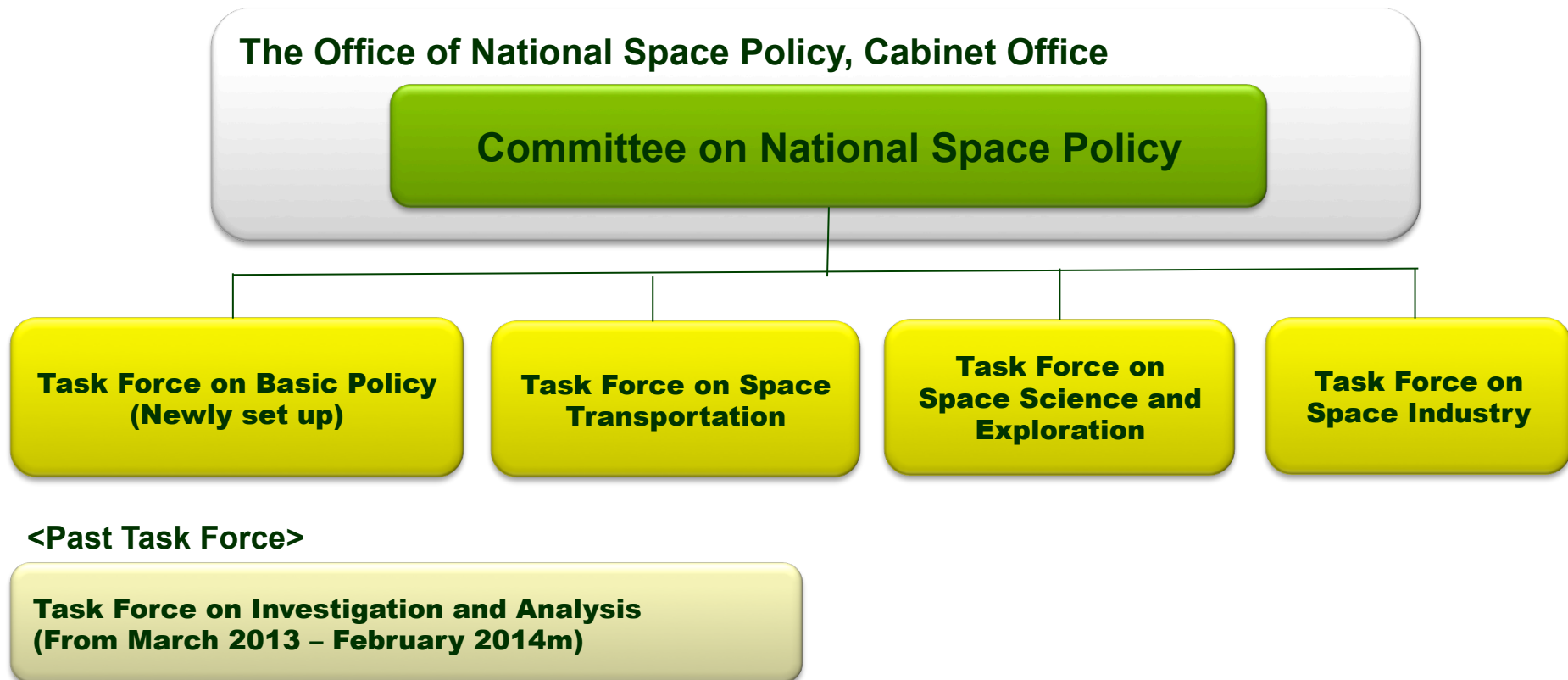


Space Governance in Japan



Committee of National Space Policy

- Based on Prime Minister's request, the committee investigates and analyzes important matters concerning:
 - Japan's space policy
 - Space-related budget
 - Safety of earth satellite and space transportation system, and
 - Conservation of space environment



- Japan's space policy and governance: Overview
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An Origin of Space Application Policy in 1970-80's (1)

Establishment of National Space Development Agency: NASDA (1969)

- One of its aims was to launch domestically-developed application satellite.

Outline of Space Development Policy (Space Activities Commission: SAC, 1978)

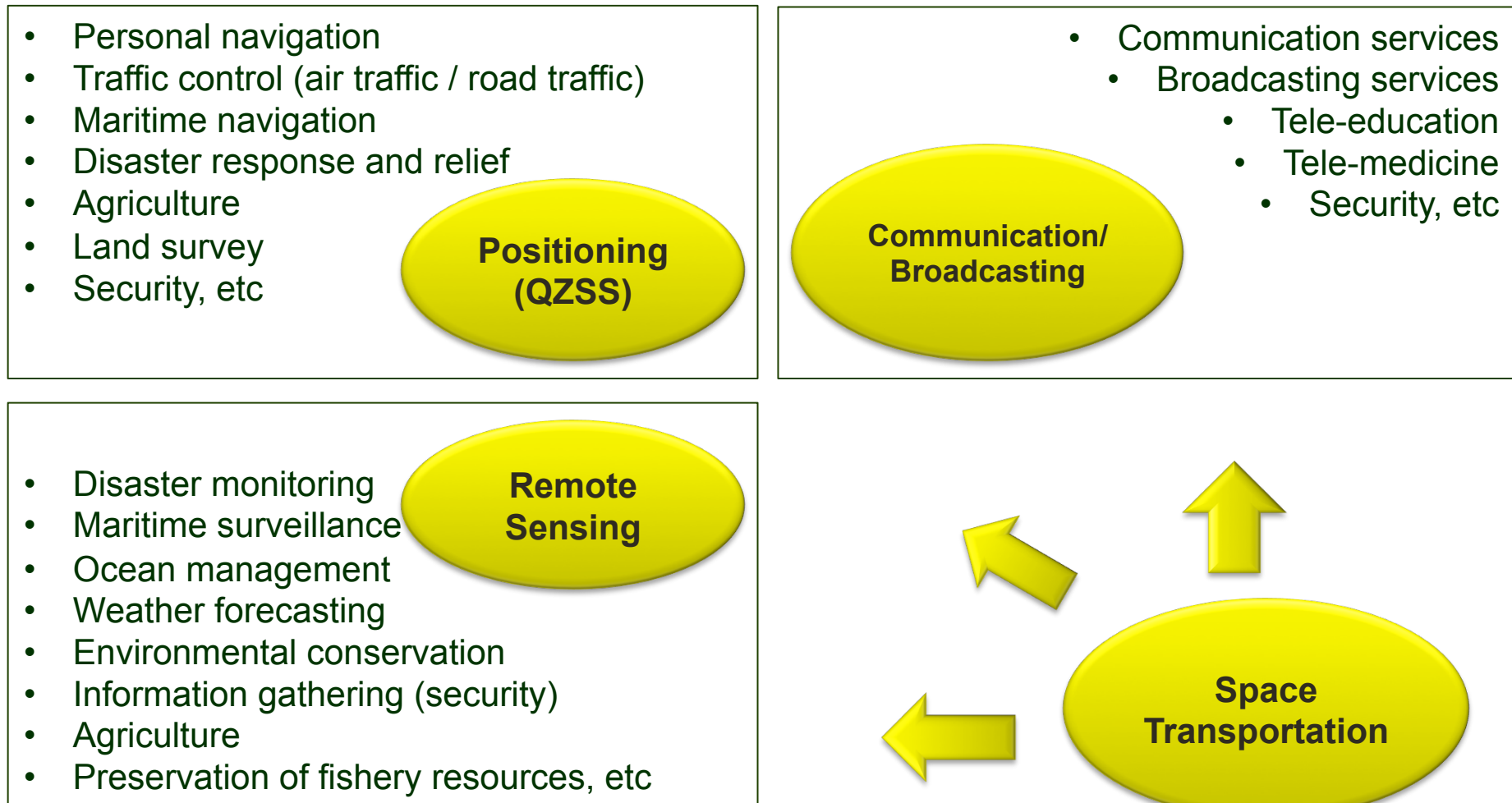
- One of the basic principles was to effectively address broad and various social needs for space application.
 - Communication Satellite
 - Broadcasting Satellite
 - Meteorological Satellite, etc.
- Promotion of domestically-developed application satellite.

An Origin of Space Application Policy in 1970-80's (2)

- **Communication Satellite (CS)**
 - In 1972, then-the Ministry of Posts and Telecommunications suggested to SAC to develop communication satellite.
 - Nippon Telegraph and Telephone Public Corporation (NTT) as a potential user
 - Main contractor: Mitsubishi Electronic
 - **Broadcasting Satellite (BS)**
 - In 1984, NHK(Japan Broadcasting Corporation) started public broadcasting service by using BS satellite called “Yuri”
 - Main contractor: Toshiba
 - **Meteorological Satellite**
 - NASDA and the Meteorological Agency started research and development in the early 1970s
 - Promotion of nationally-developed Geostationary Meteorological Satellite
 - Main contractor: NEC
- Space policy for promoting domestically-produced application satellites
 - But... respective policies for space utilization, monopolistic user
 - Encouraging Japan's satellite industry (Mitsubishi, Toshiba, NEC)
 - Impacts of **US-Japan agreement on satellite procurement in 1990**
 - Segregation and cooperation between satellite companies (Mitsubishi, Toshiba, NEC)

Space Systems as Social Infrastructure and Potential Needs for Space Application

Basic Plan on Space Policy (2013) identifies four space systems as social infrastructure



Space Application as Social Infrastructure

Current Policy on Space Infrastructure: *Basic Plan on Space Policy (2013)*

Navigation/Positioning

- Quasi-Zenith Satellite System (First satellite “*Michibiki*” was launched in 2010)
- Creating four satellites constellation by the late 2010s, completion of seven satellites constellation in the future
- Promoting overseas expansion and utilization of QZSS in the AP region

Remote sensing

- Various administrative needs potentially exists.
 - Security, weather, mapping, disaster monitoring, environmental monitoring, resource exploration, etc.
- Promoting cooperation between public and private sector (PPP, PFI)
- Promoting overseas expansion with governmental support (ODA, top-level sales)
- Clarifying data policy

Communication/Broadcasting

- Need for emergency communication when natural disaster occurs
- Basically private-sector driven space system
- Insufficient international competitiveness is a major challenge for Japan’s industry
 - Strengthening industrial base with governmental supports

Quasi-Zenith Satellite System (QZSS)

QZSS is a major space application project in Japan with the aim of expanding space utilization

Functional capabilities

- GPS Complementary / Augmentation
 - higher accuracy / credibility of positioning
- Messaging

Significances

- Upgrading and optimizing of industry, daily life, and administrative services
- Reinforcement of industrial competitiveness / creating new markets for positioning and navigation services
- Contributing to the welfare of the Asia Pacific region
- Enhancing Japan-US cooperation in the area of GNSS
- Contribution to security in a broad sense, including the improvement of the capacity of disaster response / relief / management



Image : JAXA

Case Study: QZSS -Challenges for Expanding Space Utilization

Lessons from the starting period of QZSS

- **Comprehensive policy scenario and smooth transition from R&D/technological demonstration to utilization/commercialization**
 - When the project was started in 2002, Japan had little experience in space utilization project.
 - Council for Science and Technology Policy (CSTP), which was then a decision-making body for space policy, decided to start this project from the standpoint of its technological significances, without comprehensive policy scenario including operational phase of QZSS.
 - The lack of specific organization responsible for operation of space system also increased risks for private sector.

- **Creating needs and demands for space systems in the public sector and promoting use of them as a tool of their services**
 - In other countries, space systems, such as positioning satellite system, are usually shored up by governmental needs. However, there has been little active involvement of potential governmental users to promote the use of QZSS.
 - ⇒ A policy mechanism to coordinate new technology with various administrative needs
 - ⇒ Policy and financial incentives for promoting use of new technology in public sector

- **Unclear potential market size for space systems**
 - When CSTP decided to start R&Ds for QZSS in 2002, it expressed concerns about the feasibility of industrialization and optimistic estimate of market expectation by the private companies.
 - In 2006, private sector abandoned business plan for providing communication/broadcasting services through using QZSS ⇒ As the result, policy on QZSS was largely changed.

Remote sensing satellite

Various types of remote sensing space infrastructure in operation

- Earth observation: ALOS-2 (radar) “*Daichi-2*”
- Meteorological satellite: MTSAT “*Himawari-8*”
- Information gathering: IGS (radar / optical)
- Environmental monitoring: GOSAT (Greenhouse gases observation satellite) “*Ibuki*”



Himawari-8



Daichi-2



Ibuki

Images by JAXA

Challenges

- Need to shift from R&D-driven to social needs-based policy (based on "series")
cf. IGS as an example
- Understanding and meeting various social needs for remote sensing satellite
 - Improving and specifying the quality of images / increasing the chance of observation / Improving continuity of data supply
- Enhancing whole of government approach to the promotion of utilization of remote sensing, not respective policy by each ministry and agency
- Establishing data policy: clarifying the rules of use of data derived from remote sensing satellite

Small / Micro satellite

ASNARO: Advanced Satellite with New System Architecture for Observation

- Small satellite developed by NEC and Japan space systems with the support of METI
- First satellite (ASNARO-1: optical sensor) was launched in November 2014

Features

- High performance (0.5m resolution) / Low cost
- Contribution to the improvement of frequency of observation by creating constellation
- Potential for improving earth observation, maritime surveillance, disaster monitoring and so on.

Hodopyoshi Project

- Microsat (Ultra-small satellite) development project by the University of Tokyo.
- Hodoyoshi 3 and 4 satellites was successfully launched in June 2014.
 - Very small satellite (about 60kg) with optical sensor
- The primary objective of Hodoyoshi project is “education” for design, development, engineering, launch and operation of satellite
- Aiming at utilization and industrialization in the future.



Images by Univ. Tokyo

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Space Industry in Japan

Encouraging space industry is one of the primary goals of Japan's space policy

Basic Space Law, Article 4

“Space use and exploitation shall be carried out for our country's space industries to enhance their technologies and to strengthen international competitiveness.” (unofficial translation)

- **Maintaining the autonomy of space activities**
 - Robust space industry is a foundation of Japan's space activities
 - Maintaining the autonomy of space activities is one of the principles of Japan's space policy
- **Contributing to economy**
 - Technological innovation derived from space sector spills over many other industrial fields
- **Current status of Japan's space industry**
 - International competitiveness is still insufficient
 - Cumulative commercial acceptance of orders for satellite: only 10 satellites, including recent successful contract with Turkey and Vietnam
 - Commercial launch services: only 1 occasion so far (contract with Korea)
 - Insufficient opportunity of technological demonstration
 - Most of demands for space systems and services in Japan comes from the government (90%)
- **Challenges for Japan's space industry cf. possibility of micro/nano satellite**
 - Maintaining human resources in space engineering
 - Expanding of private-sector demands
 - Through ODA and other government financial supports, encouraging Japan's space industry to advance into foreign markets
 - Promoting public-private partnership (PPP)

Discussion about Space Activities Act

Basic Space Law (2008), Article 35

“The government shall comprehensively and immediately conduct the development of laws regulating space activities and laws necessary to perform treaties and other international commitments concerning space use and exploration (unofficial translation)

Need for Space Activities Act

Background: expansion of space business by private sector

- Space services for communication and earth observation by private sector
- Space transportation service
- Space travel and sub-orbital flight
- Emergence of space venture

Japan is also promoting space industries

- Need to establish Space Activities Act in order to
 - Adhere to treaties and international promises
 - Ensure public safety and protect victims
 - Avoid diplomatic and security risks
 - Promote Japan’s commercial space activities and new entry into this field

Discussion about Space Activities Act

Clarification of responsibilities sharing between government and private sector

- **The rules and regulation for space activities in private sectors**

- Licensing for space activities
- Framework for public liability system
- Burden sharing between the government and private sector

⇒ Improving predictability of business

⇒ Enhancing stability of business management by reducing risks

⇒ Promoting sound development of commercial space activities

Points at issue

- What is the ideal balance of promotion and regulation ?
- What is the best regulating authority for licensing space activities in private sector ? (Cabinet Office, MEXT, or METI ?)
- What is the role of JAXA with expertise in space development and use ?
 - JAXA as a space agency under regulations
 - JAXA as a supporter and promoter of space industry
 - JAXA as a supporting organization for regulating commercial space activities
 - How coordinate?

Discussion about Space Activities Act

Space Activities Act and Promotion of Space Business

- **Challenges for promotion of space industry**
 - Japan's liability system and rules for space business has been unclear
 - Price for compulsory insurance in Japan is too high
 - ⇒ **Need for clarification of rules and liability system for space business**
 - **Requirements from the viewpoint of the promotion of space industry**
 - No excessive regulation
 - Not too high a price for compulsory insurance
 - Importance of the location of launch site (the price of insurance depends upon whether the launch site is located in an area of high population density or not)
- ⇒ **It is needed to clarify the risk sharing between government (government compensation) and private sector (compulsory insurance)**

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International Space Cooperation

Basic Space Law (2008) Article 6

“Space development and use shall be carried out to proactively play our country’s role in the international society and to increase our country’s interest national by actively promoting international cooperation and diplomacy with regard to space development and use.”

(unofficial translation)

Global level:

- International cooperation in the framework of UN COPUOS
- Contributing global society (international cooperation in GEOSS)
- Participating in international discussion for making a rule for space activities
 - International Code of Conduct for Outer Space Activities
- International Space Station (ISS)
- international discussion on future space exploration (ISEF), etc.

Regional level (in Asia):

- Playing a key role in APRSAF
- Launching various initiatives to use space for social development in Asia
 - Sentinel Asia / ASEAN disaster management network
- Contributing to promote space utilization in Asia cf. potential role of ISS
 - Cultivation of human resources / export of space infrastructure to Asia

Promoting Space Diplomacy in Asia

Potential areas for space application in AP region

- **Fishery Industry**
 - Prediction of fishing ground / Conservation of fishery resources / Management of EEZ / Preservation of oceanic environment, etc.
- **Agriculture**
 - Management of agricultural field / Analysis of the amount of protein / Disaster risk management, etc.
- **Maritime Safety** (collaboration between space policy and ocean policy)
 - Surveillance of suspicious ships and pirates / Disaster management, etc.
- **Disaster Management**
 - Need of response to various types of natural disasters: earthquake, tsunami, typhoon, flood, volcano etc.
 - Disaster risk management: agriculture, industrial area etc.

**Contribution
 to Asia
 Pacific region
 through
 international
 space
 cooperation**

Main actors involved in space diplomacy in Asia

- MEXT and JAXA: promoting international space cooperation through APRSAF
 - MOFA: supporting ASEAN's efforts for enhancing its connectivity
 - JICA: playing a key role in cultivation of human resources, including the field of space activities, in Asia
 - Cabinet Office and METI: promoting exports of space infrastructure to foreign countries
- ⇒ **Maximizing synergistic effects derived from possible collaborations between organizations**

Thank you very much for your attention!!