METI
Ministry of Economy, Trade and Industry

Japanese Space Industry Policy Overview

- Space industry in the big data era-

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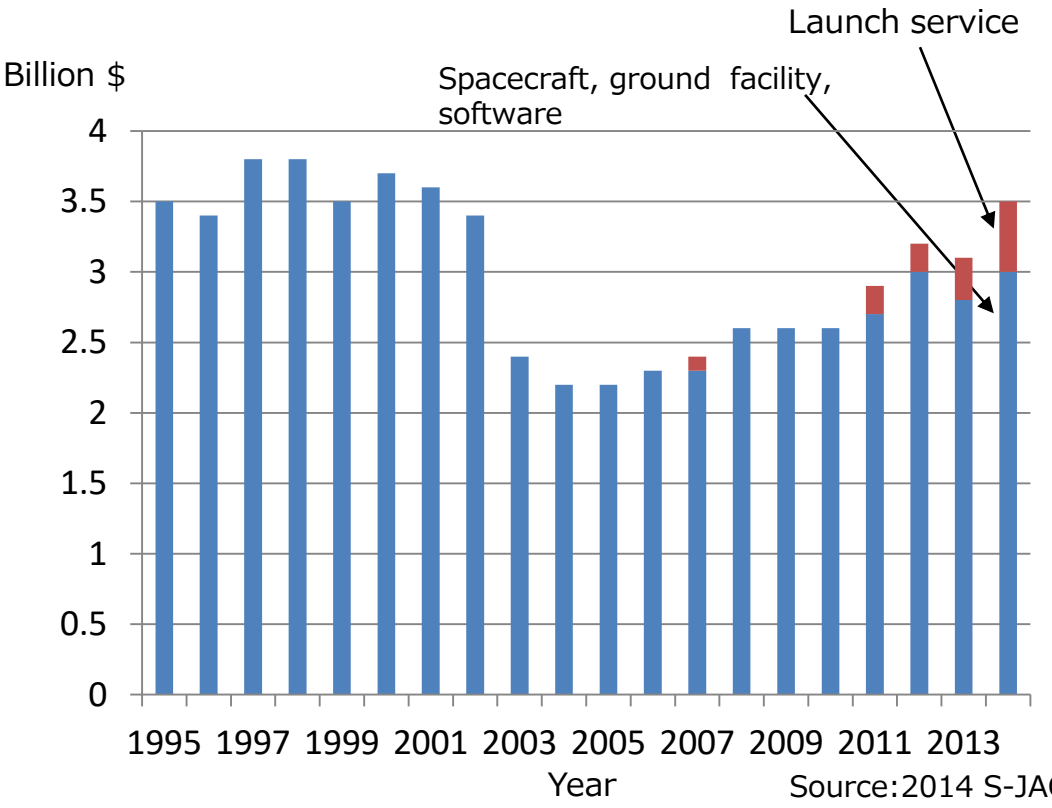
Current situation of the Space Industry in Japan

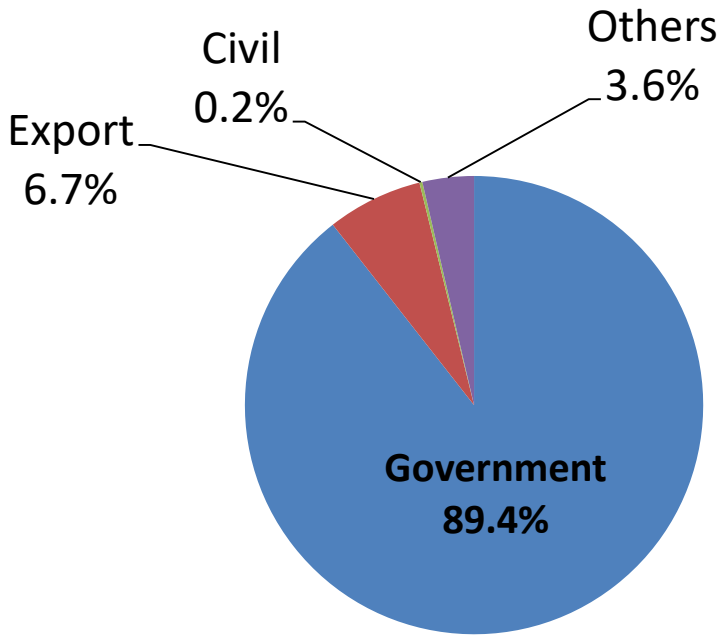
- Sales amount has steadily increased, but,,, still not big
- Heavily depends on government mission

Trend of Sales



Source:2014 S-JAC data book

Sales Structure in Japanese Space Industry (2014)



⇒ Expansion of the user business is the key

1. Policy Direction(1)
- The space industry in the fourth industrial revolution, Connected Industries-

- The quality and quantity of the data derived from space are improving dramatically.
  - Positioning : high-precision positioning service
  - Earth Observation : high resolution, high frequency data brought by small satellite constellation
- AI/deep learning is good at analyzing image data.
- Application business which will provide the solution for user industries is expected to develop rapidly, by integrating ground data and “space data.”
- “Space Industry Vision 2030”&“Growth Strategy 2017”

“Space Industry” can be positioned as “big data” industry.

(Reference) Overview of the "Space Industry Vision 2030"

- The space industry is a strong driving force for promoting the fourth industrial revolution. In addition to promoting productivity in other sectors, it is a frontier field for the creation of new growth.
- Innovative space technology is being combined with the innovation based on big data, AI, and IoT. The fields of space utilization is being expanded by declining costs through miniaturization.
- Through the expansion of the role of the private sector, Japan aims to double the market size of its entire space industry (currently 1.2 trillion yen), including the space utilization industry, in the early 2030s.

Space Utilization Industry

<CHALLENGES>

- Inadequate continuity of satellite data
- Difficulty in finding and accessing data
- Lack of satellite data solution
- Shortage of stable demand in early stages

① Improving Access to Satellite Data

Satellite Data Utilization

- Listing the types, storage locations, etc. of satellite data, including data utilization methods etc. in the future. Enhanced data continuity.
- Establishing a platform for data utilization（i.e., a data center）

Open and Free Government-owned Satellite Data

- Promoting new business creation by facilitating the use of satellite data by venture companies

② Promoting Satellite Data Utilization

Promotion of Model Projects

- Utilizing AI, big-data analytics, and human resources in these areas
- Creating new utilization models by integrating satellite and ground data, including remote-sensing satellites and QZSS
- Expanding and industrializing data utilization through cooperation with ministries and local governments as potential users

Space Equipment Industry

<CHALLENGES>

- Need to enhance international competitiveness （e.g., technological development, performance, and cost)
- Technological impediments to entry for new enterprises

① International Competitiveness

Consistent Satellite Development

- Matching market needs

New-type Mainstay Rocket（i.e., the H3)

- Reducing costs by half and shortening the production period

Parts and Components Technology

- Selection and development of key parts and components

Improvements of the Procurement Framework

Support System for Technological Development

② Supporting New Enterprises

Enhancing Opportunities for Demonstration on Orbit

- Providing one-stop service for overall support measures

Small Rocket Launch

- Researching market trends, establishment of guidelines, and trends in small rocket ventures

Space System Overseas Development

<CHALLENGES>

- Strategic international cooperation corresponding to partner countries' development stages
- Studying and promoting long-term and sustainable strategies

Packages corresponding to Partner Countries' Needs

- Composing packages for physical equipment, services, and human resources developments

International Cooperation

- QZSS high-precision positioning service in Asia and Oceania. Coordinating with the EU's Galileo
- Strengthening cooperation with APRSAF, ERIA, NASA, DLR, and other organizations

Sustaibnable Coordination System

- Appointing "Project Managers" to promote projects continuously and proactively

※1. APRSAF=Asia-Pacific Regional Space Agency Forum
※2. ERIA=Economic Research Institute for ASEAN and East Asia

Environment for New Space Businesses

<CHALLENGES>

- Shortage of risk money and thickness of new enterprises
- Global trends focusing on the establishment of laws for new businesses

Encouraging New Ideas and Businesses

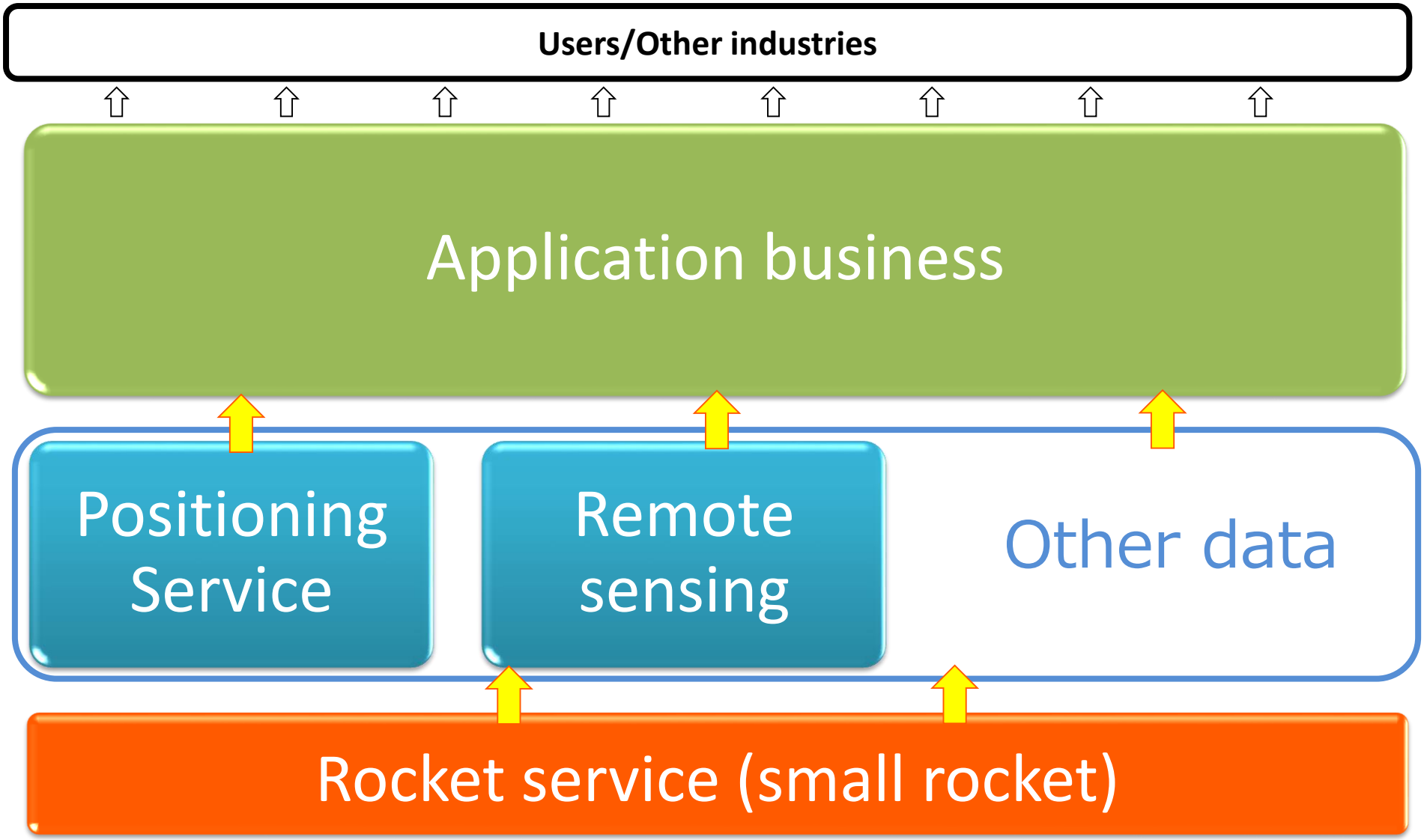
- Strengthening the supply of risk money
- Implementing idea contests and supporting commercialization (S-NET etc.)

Institutional Settings for New Businesses

- Investigation for "on-orbit servicing" and "space resource exploration"

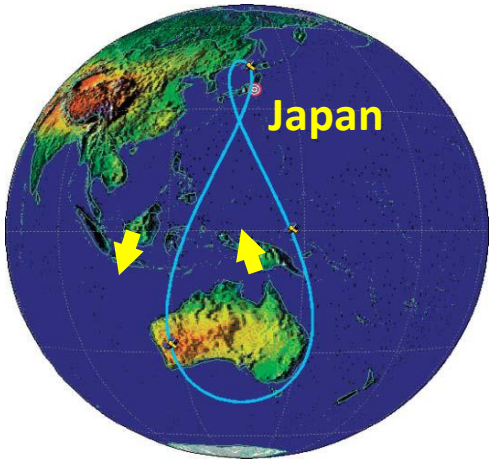
1. Policy Direction(2)

- The space industry in the fourth industrial revolution, Connected Industries -



2. Positioning(1)
- QZSS（Quasi-Zenith Satellite System）-

- Three satellites have been already launched, and an additional satellite will be launched this year. The operation starts in 2018.
  - 7 satellites around 2023 is national target
- Positioning service at cm-level
- Asia-Oceania region will be covered.



Diversified application service is expected in Japan and Asia-Oceana region

Source: cabinet office

2. Positioning(2)
- Possible application cases -

Mobility	Autonomous driving, new road charging system, Unmanned aerial vehicle(UAV)/drone, etc.
Location Based Service (LBS)	Mobile application including commerce, sports, etc.
Agriculture	Autonomous driving, etc.
Airline	Satellite-based augmentation system(SBAS), etc.
Railway	Operation management, etc.
Construction	Autonomous driving, etc.
Marine	Fish boat monitoring, etc.

(Reference) Applications (Autonomous Driving)

- Autonomous Driving = Dynamic Map + relative sensors (IMU, vision sensor, radar, etc.) + absolute sensor (GNSS including QZSS)

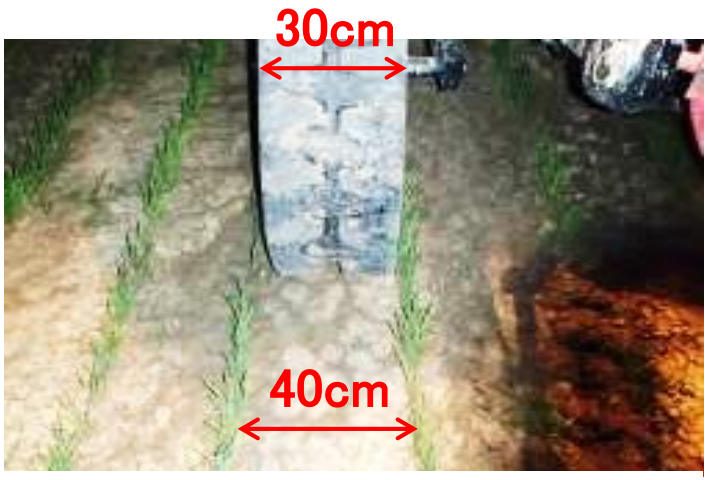
High resolution digital map

Road, Trafic Information on the driving route

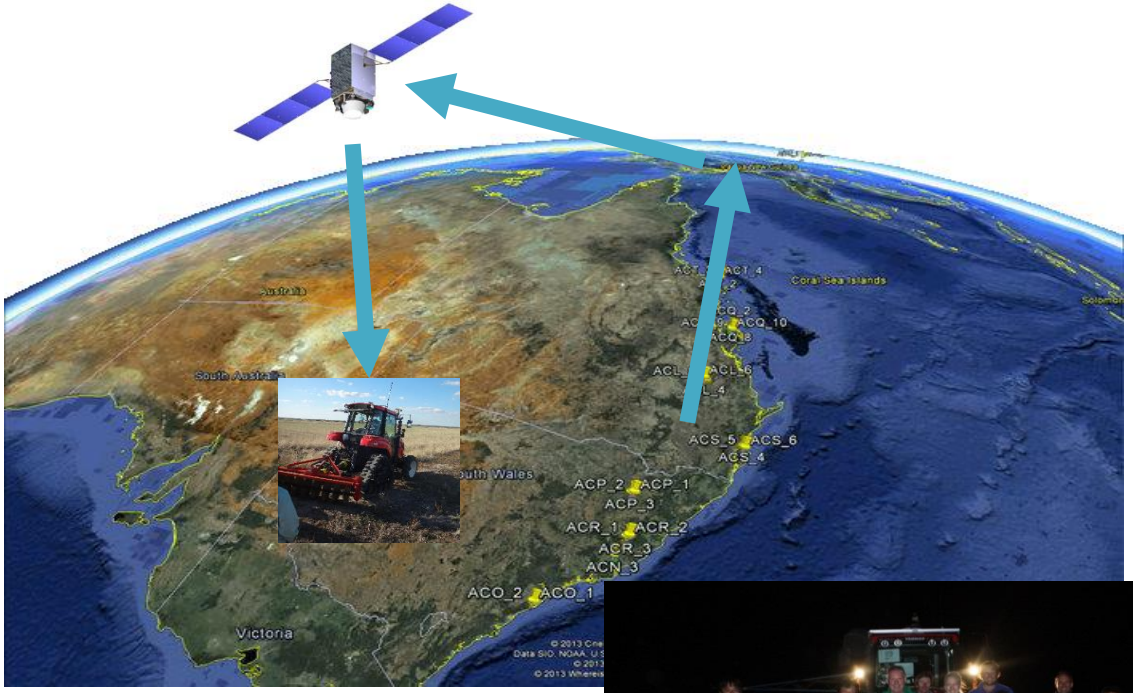
※precise positioning of QZSS → detection of “lane” base

Sourse: Japan Cabinet Office Strategic Innovation Program (SIP) Symposium 2014

(Reference) Applications (Tractor Auto-Driving)



Tractor tracks of RTK and PPP-AR guidance

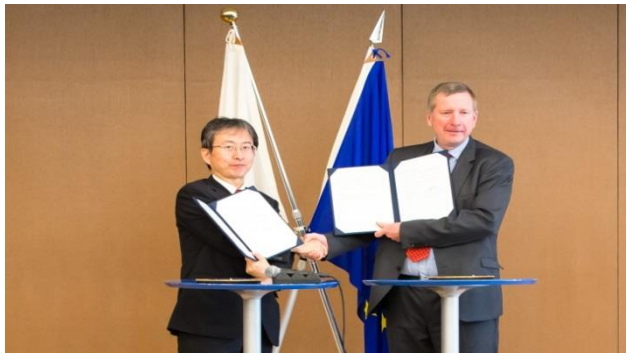


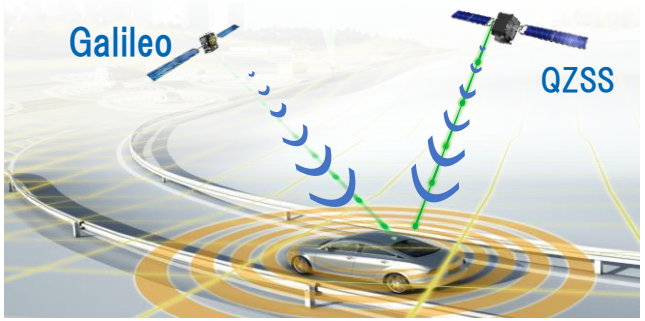
JP-AU joint project

(C) MIC, Hitz, Hitachi, Hitachi Solutions,Yanmar, CRC-SI, et al.

Positioning (3)
- Collaboration with Europe in GNSS -

- Collaboration between Europe(Galileo) and Japan (QZSS) is vital to stimulate the world's GNSS market and to incubate new business which can bring a variety of benefits to end user in the world.
- METI welcomes the MOU singing between Europe and Japan in this area so that Europe and Japan may accelerate the GNSS application.

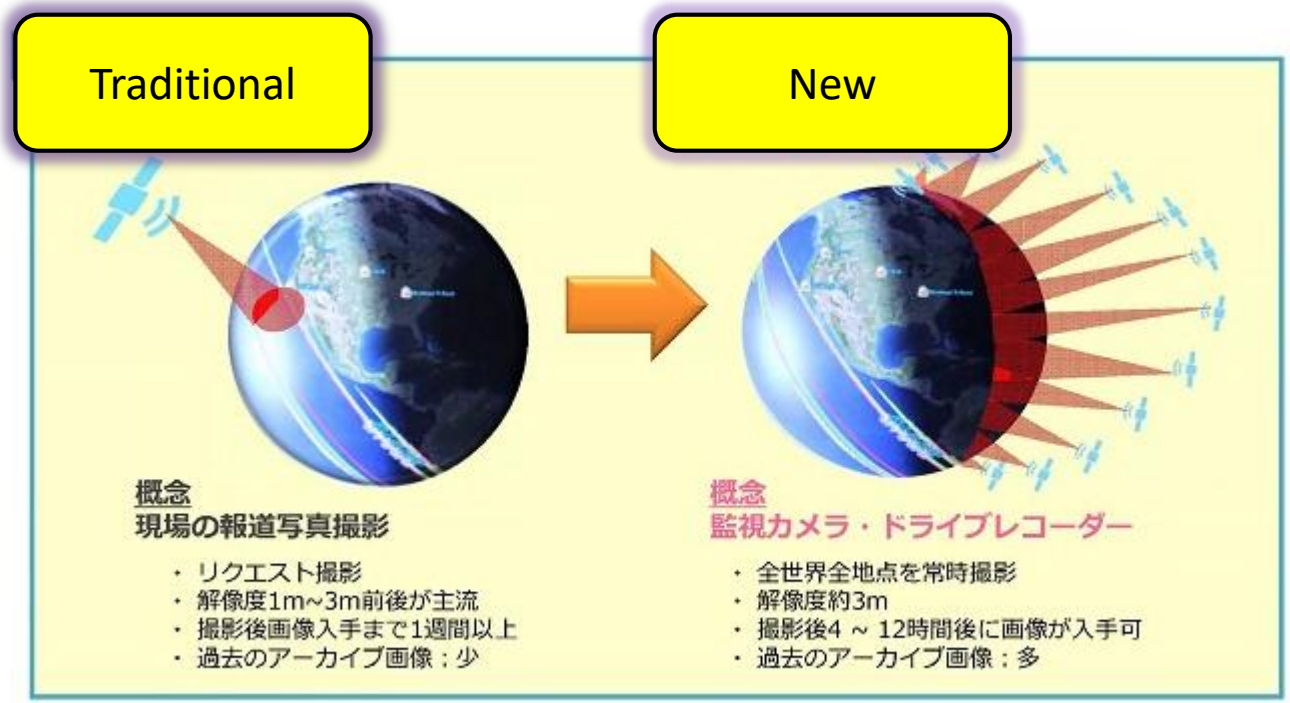


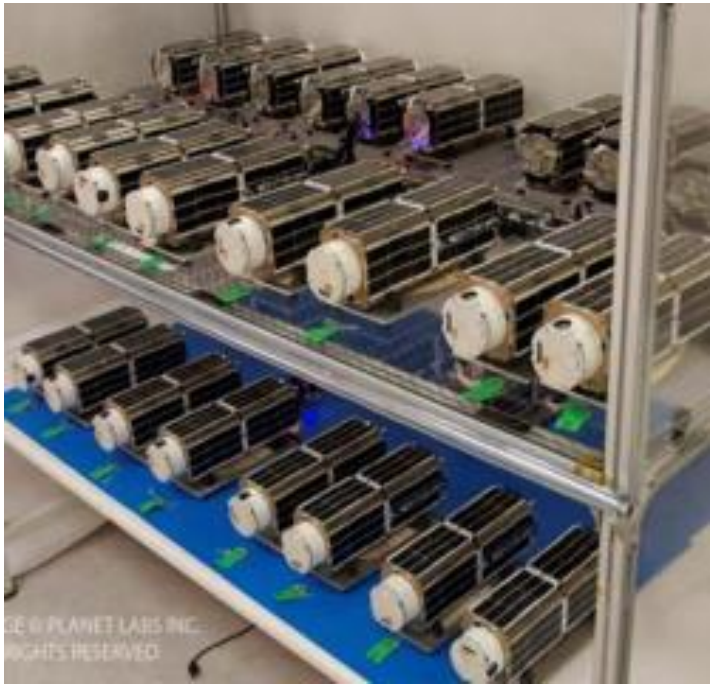


Date : March 8th, 2017
Purpose : exchanging views on civilian use of space / supporting civilian use of positioning satellites by Japan-Europe collaboration
Japan side : the National Space Policy Secretariat, Cabinet office of Japan
EU side : the Directorate General for Internal Market, Industry, Entrepreneurship and SMEs of the European Commission

3. Remote Sensing (1)

- Remote sensing technology has improved dramatically in recent years and became indispensable part of the big data infrastructure.
- Venture companies that provide huge amounts of data at high frequency by using small satellite constellation are emerging.
- Need to create the friendly environment including finance for new participants to the market

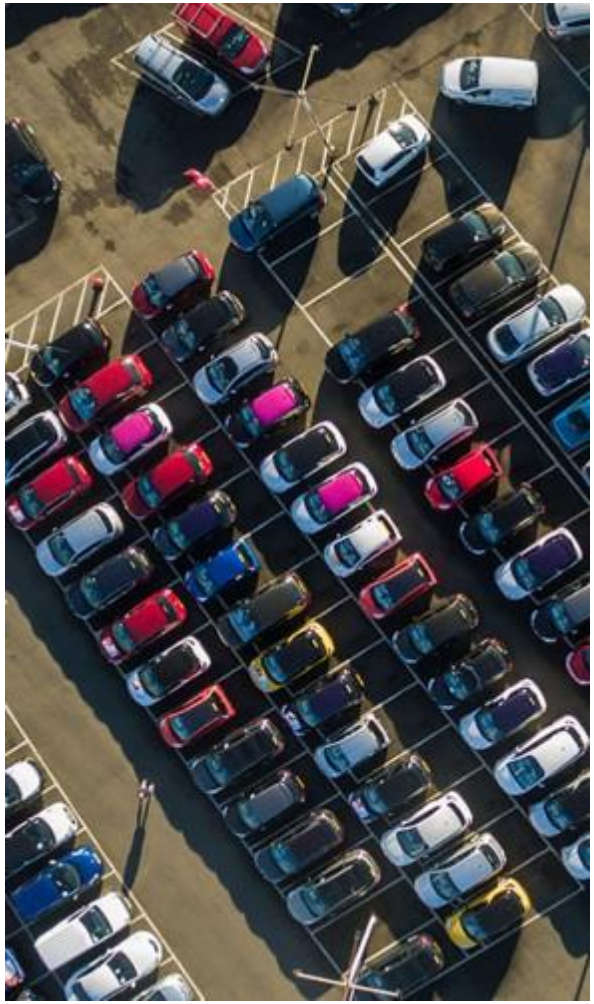




Source: snet, Planet

3. Remote Sensing (2)

- New utilization, but still seems transition



source : Planet, Orbital insight

3. Remote Sensing (3)
- Possible application cases -

Agriculture	Monitoring, growth survey , etc.
Forest	Surveillance for illegal deforestation, etc.
Infrastructure	Monitoring, construction management, plant management, etc.
Natural resources	Field development management, etc.
Finance, insurance	Trading (energy, minerals, agricultural products), damage survey, etc.
Urban development	Housing information, traffic management, etc.

Space data is not enough! Combination with other ground data, UAV and positioning service is important.

4. Rocket Service

- There is a growing demand for small satellites.
- Competitive rocket service is vital to make satellite service competitive.
- Promotion of the new players

<JAXA SS520-4>

- Using consumer Parts
- Renovated into a three-stage rocket based on sounding rockets “SS 520”
- Put microsatellite weighing)

▼

- Demonstration failed in January
- Challenge again

<Interstellar Technologies>

- Small venture: 10 employees
- Location : Taikicho, Hokkaido
- Using general parts and manufacturing by themselves
- Try to reach 100 km altitude

source : JAXA, Interstellar Technologies

5. New participants to the market

- Japanese space industry is to be more attractive.
- Promotion of new participants to the market and supporting the creation of venture companies is important

Finance

Legal structure to new areas

Matching

, etc...

<S-NET: Space New Economy Creation Network>

- Providing a platform that connects companies and individuals involved in the creation of new industries and services with the keyword of space
- Conducting business matching and supporting business development

Platform

One stop

Coordination

(Reference)

- Japan has held B to B matching events for private companies with EU countries
- Precious opportunity for both companies to expand new business potential

Year	Partner country	Partner company	Place	Participating companies (JP side)
June, 2016	France	Airbus Safran Launchers, Airbus Defense & Space, Thales Alenia Space etc	Paris	13 companies
April, 2017	Italy	e-GEOS, AVIO, Thales Alenia Space Italia, Leonardo	Tokyo	9 companies
July, 2017	Germany	Airbus Defense & Space, Kastanienbaum, Vialight etc	Tokyo	15 companies

(Reference)

- Industrial co-operation on space is stipulated in Japan-UK Joint Declaration on Prosperity Cooperation (August 31, 2017)

the lifting of EU import restrictions on food and feed from Japan, including those from Fukushima where they have been scientifically verified as safe.

c) Championing global free trade through multilateral forums: The UK welcomes Japanese support to establish the UK's independent commitments at the WTO. We commit to working together to progress plurilateral agreements including the Trade in Services Agreement and the Environmental Goods Agreement. Both sides recognise the importance of ambitious regional trade deals as steps towards eliminating global barriers to commerce.

Industrial Policy Dialogue

4. We have decided to launch a new Industrial Policy Dialogue to deepen our cooperation on industrial policies, focused on innovative economies of the future. Our senior officials will convene in Tokyo this year for the first round of this dialogue. This co-operation will initially be based on space, aviation, energy and climate change, advanced manufacturing, and bio-economy.

Joint Committee on Science and Technology

5. Since 1994 Japan and the UK have held Joint Committee meetings based on the Agreement between the Government of Japan and the UK on Co-operation in Science and Technology that have consistently identified new areas for cooperation between our countries.
6. To facilitate greater collaboration, we will aim to establish a "Lead Agency Arrangement" between our research and innovation funding agencies (UKRI, JSPS and JST)[1] to enable our researchers and businesses to more easily collaborate by the next Joint Committee meeting.

Nuclear Dialogue

7. The Nuclear Dialogue is an opportunity to gather officials from across the governments of Japan and the UK once a year, and strengthen bilateral cooperation across the full range of civil nuclear activities. The Dialogue covers the following five areas: nuclear policy; nuclear decommissioning and decontamination; research and development; public communication; and safety and regulation.
8. The UK welcomes Japanese industry involvement in the UK's new build programme. We recognise that the complementary strengths of Japanese and British companies in the civil nuclear sector give us the opportunity to pursue more strategic partnerships for mutual benefit and gain.

Cooperation on Climate change

9. We are both committed to action on climate change and the effective implementation of the Paris Agreement. We will work together to support a successful 2018 UN Facilitative Dialogue, and explore the possibility of

[1] Respectively UK Research and Innovation, the Japanese Society for the Promotion of Science and the Japanese Science and Technology Agency.

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Thank you for your attention