Japanese Space Industry Policy
Overview

- Space industry in the big data era-

September 6th, 2017
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Director, Space Industry Office
Ministry of Economy, Trade and Industry (METI)
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


⇒ 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.
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

<table>
<thead>
<tr>
<th>① Improving Access to Satellite Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite Data Utilization</td>
</tr>
<tr>
<td>• Listing the types, storage locations, etc. of satellite data, including data utilization methods etc. in the future. Enhanced data continuity.</td>
</tr>
<tr>
<td>• Establishing a platform for data utilization (i.e., a data center)</td>
</tr>
<tr>
<td>Open and Free Government-owned Satellite Data</td>
</tr>
<tr>
<td>• Promoting new business creation by facilitating the use of satellite data by venture companies</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>② Promoting Satellite Data Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion of Model Projects</td>
</tr>
<tr>
<td>• Utilizing AI, big-data analytics, and human resources in these areas</td>
</tr>
<tr>
<td>• Creating new utilization models by integrating satellite and ground data, including remote-sensing satellites and QZSS</td>
</tr>
<tr>
<td>• Expanding and industrializing data utilization through cooperation with ministries and local governments as potential users</td>
</tr>
</tbody>
</table>

### Space Equipment Industry

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

<table>
<thead>
<tr>
<th>① International Competitiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent Satellite Development</td>
</tr>
<tr>
<td>• Matching market needs</td>
</tr>
<tr>
<td>New-type Mainstay Rocket (i.e., the H3)</td>
</tr>
<tr>
<td>• Reducing costs by half and shortening the production period</td>
</tr>
<tr>
<td>Parts and Components Technology</td>
</tr>
<tr>
<td>• Selection and development of key parts and components</td>
</tr>
<tr>
<td>Improvements of the Procurement Framework</td>
</tr>
<tr>
<td>Support System for Technological Development</td>
</tr>
</tbody>
</table>

### Space System Overseas Development

**<CHALLENGES>**
- Strategic international cooperation corresponding to partner countries’ development stages
- Studying and promoting long-term and sustainable strategies

<table>
<thead>
<tr>
<th>Packages corresponding to Partner Countries’ Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Composing packages for physical equipment, services, and human resources developments</td>
</tr>
</tbody>
</table>

**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

**Sustainable Coordination System**
- Appointing “Project Managers” to promote projects continuously and proactively

### 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.

Source: cabinet office

Diversified application service is expected in Japan and Asia-Oceana region
## 2. Positioning(2)
- Possible application cases -

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Autonomous driving, new road charging system, Unmanned aerial vehicle(UAV)/drone, etc.</td>
</tr>
<tr>
<td>Location Based Service (LBS)</td>
<td>Mobile application including commerce, sports, etc.</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Autonomous driving, etc.</td>
</tr>
<tr>
<td>Airline</td>
<td>Satellite-based augmentation system(SBAS), etc.</td>
</tr>
<tr>
<td>Railway</td>
<td>Operation management, etc.</td>
</tr>
<tr>
<td>Construction</td>
<td>Autonomous driving, etc.</td>
</tr>
<tr>
<td>Marine</td>
<td>Fish boat monitoring, etc.</td>
</tr>
</tbody>
</table>
Autonomous Driving = Dynamic Map + relative sensors (IMU, vision sensor, radar, etc.) + absolute sensor (GNSS including QZSS)
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.
3. Remote Sensing (2)

- New utilization, but still seems transition

source: Planet, Orbital insight
### 3. Remote Sensing (3)
- Possible application cases -

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Monitoring, growth survey, etc.</td>
</tr>
<tr>
<td>Forest</td>
<td>Surveillance for illegal deforestation, etc.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Monitoring, construction management, plant management, etc.</td>
</tr>
<tr>
<td>Natural resources</td>
<td>Field development management, etc.</td>
</tr>
<tr>
<td>Finance, insurance</td>
<td>Trading (energy, minerals, agricultural products), damage survey, etc.</td>
</tr>
<tr>
<td>Urban development</td>
<td>Housing information, traffic management, etc.</td>
</tr>
</tbody>
</table>

**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

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Partner country</th>
<th>Partner company</th>
<th>Place</th>
<th>Participating companies (JP side)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June, 2016</td>
<td>France</td>
<td>Airbus Safran Launchers, Airbus Defense &amp; Space, Thales Alenia Space etc</td>
<td>Paris</td>
<td>13 companies</td>
</tr>
<tr>
<td>April, 2017</td>
<td>Italy</td>
<td>e-GEOS, AVIO, Thales Alenia Space Italia, Leonardo</td>
<td>Tokyo</td>
<td>9 companies</td>
</tr>
<tr>
<td>July, 2017</td>
<td>Germany</td>
<td>Airbus Defense &amp; Space, Kastanienbaum, Vialight etc</td>
<td>Tokyo</td>
<td>15 companies</td>
</tr>
</tbody>
</table>
Industrial Policy Dialogue
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.

(Reference)
- Industrial co-operation on space is stipulated in Japan-UK Joint Declaration on Prosperity Cooperation (August 31, 2017)
Thank you for your attention