Brazilian Space Programme and Cooperation with Partners

Horizon 2020 Space Info Day
November 9th 2015, Hotel Le Plaza Brussels
Presentation topics

• Why does Brazil need a space program?
• Brief history
• Governance structure
• Legal framework
• Long-term objectives
• Challenges
• Recent developments
• Why international cooperation?
• Cooperation with the EU
Why does Brazil need a space program?

• Large territory extension.
• Demographic concentration along the coastal zone;
• Vast regions of tropical forests.
• Large areas of difficult access and scarcely populated.
• Extensive borders and coastline.
• A significant amount of natural resources not yet adequately mapped.
• Brazil’s special location on the globe
Brief History

• **1946:** Creation of the nowadays called Department of Aerospace Science and Technology of the Brazilian Air Force

• **1960:** A Commission was charged by President Jânio Quadros with the task of formulating a Brazilian national space-faring program.

• **1961:** As a result, the Organizing Group of the National Commission of Space Activities was established in São José dos Campos, state of São Paulo.

• **1971:** This group was replaced by the National Institute of Space Research (INPE).

• **1994:** The Brazilian Space Agency was created, a central coordinating governmental body, under civil control.
Governance structure

• **Brazilian Space Agency (AEB)**, under the Ministry of Science, Technology and Innovation (**MCTI**), in charge of formulating and coordinating the implementation of the Brazilian space policy.

• **National Institute of Space Research (INPE)**, under MCTI, which develops satellites and its technologies and space applications;

• **Department of Aerospace Science and Technology (DCTA)**, under the Ministry of Defence, which carries out research and development of launch vehicle systems and related technologies, through its **Institute of Aeronautics and Space (IAE)**.

• **DCTA** operates the **launch center of Barreira do Inferno (CLBI)**, located in Natal, in the state of Rio Grande do Norte, and **the launch center of Alcântara (CLA)**, in the state of Maranhão.

• **DCTA** also comprises the **Technological Institute of Aeronautics (ITA)**, a top high education institution which trains many of the Brazilian researchers in the space field.

• The **National System for the Development of Space Activities (SINDAE)**, established in 1996, gathers government, industry and academia.
Legal framework

*main instruments*

- The **1994 Brazilian National Policy for the Development of Space Activities** set as a strategic goal the development of national space technology capabilities.

- The main current policy instrument is the **National Programme of Space Activities 2012-2021 (PNAE 2012-2021)**. It identifies priority actions, investments needs and international cooperation possibilities. It also foresees a calendar of space missions and describes a set of specific projects. Some of the projects mention cooperation with international partners.

- The **2004 Technological Innovation Law** provided conditions to build a more favorable environment for partnerships between universities, technological institutes and industry.

- There is **legal framework in Brazil that provides for the participation of the private sector in space activities in Brazil**, particularly in space launch from the Brazilian territory. For that purpose, foreign private companies must register as enterprises in Brazil, in accordance with the Brazilian national law.
Long-term objectives

• To develop and consolidate the space industry in Brazil.

• To master the complete technological cycle of design, development, manufacturing, integration and operation of satellites.

• To carry out projects that can make a contribution to sustainable development in Brazil and the world.

• To focus on international cooperation with a view to the joint development of technologies.
Challenges

• The government is the only buyer: government organizations continue to play the role of main contractors, with the legal hurdles and red tape typical of government procurement.

• The risks and high investments needed to develop complex technologies are major obstacles for Brazilian companies to develop space capabilities. Investments in research and development programs are still essentially from governmental sources.

• Government investments should be at adequate levels and continuous to avoid discontinuity in actions and projects, since space projects take long time to bear fruit.

• Procurement legislation should be adapted to deal adequately with the unique characteristics and risks of space projects.

• The consolidation of the space industry, by increasing its competitiveness and innovation capacity, through different governmental instruments and mechanisms, is strategic and mandatory for the sustainability of space programs.
Recent Developments

• Especially in the 80’s and 90’s, a space sector industrial base developed in Brazil, comprised of mostly small and medium engineering companies, with low working capital, but able to develop prototypes, parts, equipment and subsystems for projects contracted essentially by the Government. So far, these companies have no significant competitive insertion in the international market. An industrial cluster has taken shape in the city of São José dos Campos.

• The domestic industry has achieved high technical levels in niches like the design and manufacturing of optical cameras, solar panels, solid propulsion systems, power supply, mechanical structures, thermal control and communications.

• One of the drivers for the development of national capabilities is the long time joint cooperation program for the development of the series of China Brazil Earth Resources Satellite (CBERS). CBERS-4 was launched in December 2014.

• The number of engineers and technicians is insufficient and in certain areas Brazil still faces international restrictions on the purchase of parts and components.
In 2012, a public-private joint venture between EMBRAER and TELEBRAS resulted in the creation of **VISIONA**, the first national prime contractor company for space systems. VISIONA will conduct the **Geostationary Satellite for Defence and Strategic Communications (SGDC) project**, which aims at securing governmental communications and digital inclusion for population in remote areas. The Franco-Italian company Thales Alenia Space (TAS) won an international tender and signed a contract with the Brazilian government to build the telecommunications satellite.

It is expected also that VISIONA, in the medium and long term, acting as prime-contractor for other national satellite projects, will assist in the **organization and consolidation of the Brazilian space supply chain**.

Thales Alenia Space and AEB have recently signed the **Definitive Transfer of Technology Agreement**, which further specifies the general ideas of a 2013 MoU. Based on the agreement between AEB and TAS, AEB and the Brazilian financing agency for innovation in the industry (FINEP) launched last September a public call for projects covering several topics, for instance platforms, payloads, ground systems and applications.
Why international cooperation?

- International cooperation is an important instrument to promote the advancement in space programs, due to the high costs and risks normally involved.
- Brazil has cooperated with Argentina, China, France, Germany, India, Italy, Japan, Russia, South Africa, Ukraine and the United States, among others.
- Mutual interests, joint efforts and shared benefits are the ideas which underlie the Brazilian space cooperation.
Cooperation with the EU

- Brazil had a significant participation in FP7 projects. In light of the 2011 European Commission’s Agenda for Change, Brazilian entities and researchers cannot be funded by the EU under Horizon 2020. This raises fears about a potential decrease in the level of Brazilian participation in Horizon 2020 in comparison with FP7.

- Coordinated calls under Horizon 2020 have been agreed (not in space) and are an option for cooperation, but they usually demand complex negotiations.

- Under the Strategic Partnership launched in 2007, Brazil and the EU established Sector Dialogues, one of which on Civil Space Cooperation.

- Under this dialogue, a joint project between the Ministry of Development, Industry and Foreign Trade of Brazil and then DG Enterprise led to the publication, in December 2014, of a study on Brazilian and European initiatives and best practices on the development of the micro and nanosatellite industry.

- There are also ongoing projects between INPE and the Joint Research Centre of the European Commission, involving the use of satellite images in human settlement mapping, forest types mapping and forest degradation monitoring.

- Brazil and the EU signed in 2011 a letter of intent concerning the future creation of a structured space policy dialogue, with particular focus on: earth observation and earth science; contribution to the Group on Earth Observation and the Committee on Earth Observation Satellites; global navigation satellite systems; satellite communications; space science; and space exploration.
Thank you!

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