

24. Brazil

Brazil's space programme covers the entire range of space technologies and applications. The Brazilian space agency (Agência Espacial Brasileira, AEB) is the largest space organisation in Latin America, with a budget of BRL 352 million in 2010 (around USD 210 million). In co-ordination with AEB, the National Institute for Space Research (INPE) designs half of Brazilian satellite subsystems and contracts them to the industry. It is estimated that some 3 400 people work directly for the Brazilian space programme, either in governmental agencies or industry (AEB, 2010). Brazil owns ten satellites, the majority procured for telecommunications. In addition to meteorology, some of its satellites are dedicated to land remote sensing, and have been designed and built in co-operation with China. The China – Brazil Earth Resources Satellites (CBERS) programme so far includes a family of five remote-sensing satellites (2 operational in 2010) built jointly by Brazil and China. CBERS-3 should be launched in 2011 and CBERS-4 in 2014. The Brazilian participation in the programme amounts to a total cost of USD 500 million, with 60% of investment taking the form of industrial contracts. From 2004 to 2010, more than 1.5 million images were delivered to users in Brazil, Latin America and China for forestry and agriculture assessment (e.g. sugarcane and soybean crops assessments), urban management and geological mapping. From 2012 onwards, African ground stations in South Africa, the Canary Islands, Egypt and Gabon will receive and freely share CBERS data. The country is developing indigenous rocket launching capabilities at its Alcantara Space Centre, aiming to compete with other space-faring countries in commercial launch provision. Brazil also

contributes data from its own meteorological satellite to the World Meteorological Organisation and should join the European Southern Observatory (ESO) organisation in 2011, becoming its fifteenth member state and the first from outside Europe.

Methodological notes

The data are provided by the Brazilian space agency, the Planning Commission and the Brazilian aerospace industry association. All figures are in the national currency, the Brazilian real (BRL).

Sources

- Associação das Indústrias Aeroespaciais do Brasil (AIAB) (2009), *Números da Associação das Indústrias Aeroespaciais do Brasil*, Brasília, Brazil, www.aiab.org.br.
- Brazilian Space Agency (EAB) (2011), *Annual Report*, Brasília, Brazil.
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Space programmes in Latin America

Many countries in Latin America are developing their own space programmes. Brazil and Mexico are the largest owners and operators of space systems in the region, but many other Latin American countries are actively seeking to develop their own space programmes. Micro-satellites are currently being developed in Argentina, Chile and Peru, while international astronomical telescope facilities have been established in Chile, Colombia, Honduras, Paraguay, Peru and Uruguay. A number of countries also have their own astronauts, who flew to orbit using the US Space Shuttle or the Russian Soyuz system.

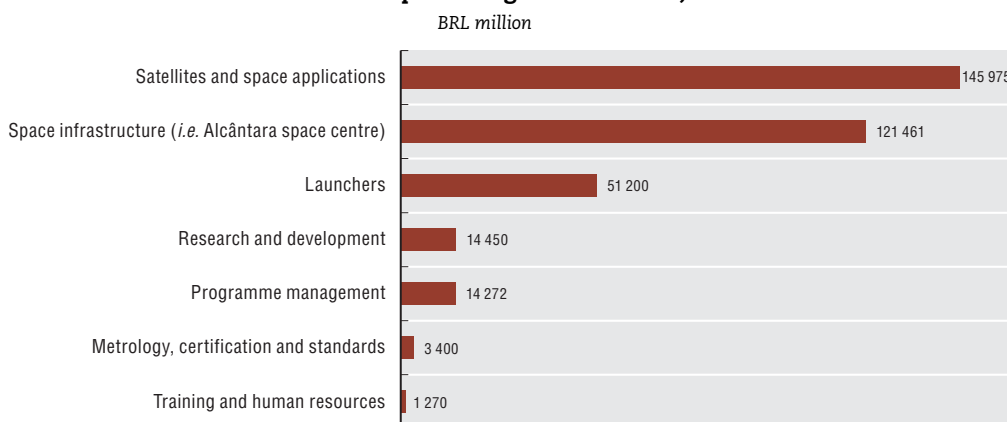
- **Argentina:** The Comisión Nacional de Actividades Espaciales (CONAE) is the country's space agency, which has already designed some small satellites. Owner of five procured telecommunications satellites, Argentina is starting to build its own satellites: ARSAT-1, the first geostationary telecommunications satellite is planned to be launched in 2011. The country is also pursuing new remote sensing capabilities.
- **Chile:** Chile became the 31st member of the OECD in 2010. It has recently formed a space agency (Agencia Chilena Espacio – ACE) and is developing remote sensing and micro-satellite capabilities. It aims to launch its first earth observation satellite (dubbed Sistema Satelital para Observación de la Tierra) by 2011. The country's geographic location has also allowed the development of national scientific space research programmes, particularly in astronomy, with the setting up of several large international telescopes.
- **Colombia:** The Colombian Space Commission was created in 2006 to promote the development of space activities, particularly remote sensing applications.
- **Ecuador:** The Ecuadorian Civilian Space Agency (Agencia Espacial Civil Ecuatoriana EXA) was established in November 2007. An active suborbital programme is underway with the objective to fly microgravity experiments and future astronauts.
- **Mexico:** Mexico, an OECD member state since 1994, has focused on developing commercial satellite communication services. In 1997, the Mexican government created the Satelites Mexicanos (Satmex) to oversee its satellite operations and the company currently owns three satellites in orbit. The national space agency (Agencia Espacial Mexicana, AEXA) was created in 2010, as a decentralised public agency responsible for encouraging the development of scientific and technological research.
- **Peru:** Peru is developing remote sensing capabilities, particularly to tackle natural disasters, via its National Aerospace Research and Development Commission (Comisión Nacional de Investigación y Desarrollo Aeroespacial – CONIDA). The objectives are to launch a sounding rocket and a mini-satellite, as well as forming and training the first Peruvian astronaut.
- **Uruguay:** The Aeronautics and Space Research and Dissemination Centre (Centro de Investigación y Difusión Aeronáutico-Espacial – CIDAE) is in charge of co-ordinating international co-operation, particularly for astronomy.

24.1 Key statistics on the Brazilian aerospace sector, 2005-08

	2005	2006	2007	2008
Revenues (USD billion)	4.3	4.3	6.2	7.55
Share of GDP (%)	1.5	1.5	1.9	2.02
Exports (USD billion)	3.7	3.9	5.6	6.74
Employment	19.800	22.000	25.200	27.100
Main sectors				
Aeronautics (%)	87.3	90.8	91.3	89.13
Defence (%)	9.29	5.78	6.6	8.79
Space (%)	0.24	0.41	0.4	0.57
Total exports as a % of revenues	90	90.5	90.8	90.8

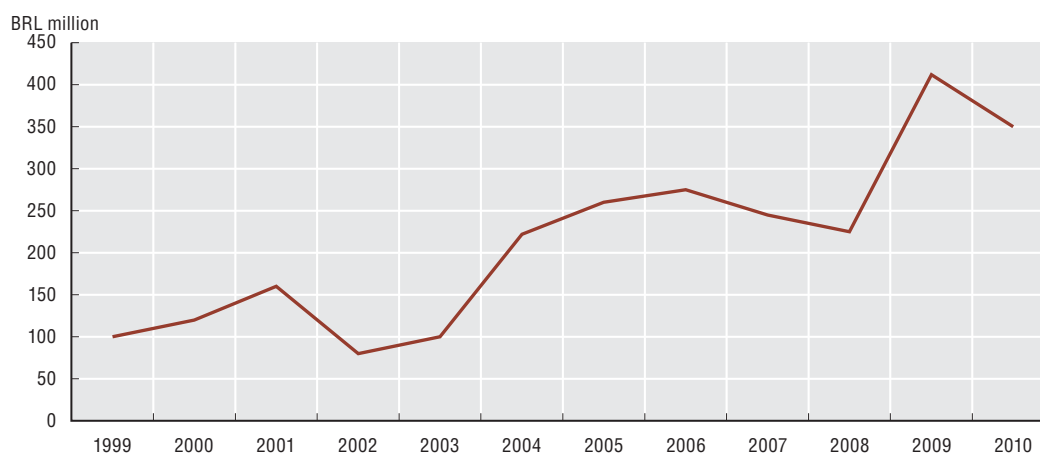
Source: AIAB (2009).

24.2 Brazilian space budget distribution, 2010



Source: Comissão Mista De Planos (2010).

24.3 Brazilian space budget



Source: EAB (2011).



From:
The Space Economy at a Glance 2011

Access the complete publication at:
<https://doi.org/10.1787/9789264111790-en>

Please cite this chapter as:

OECD (2011), "Brazil", in *The Space Economy at a Glance 2011*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264113565-29-en>

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