PORTUGAL SPACE 2030

A RESEARCH, INNOVATION AND GROWTH STRATEGY FOR PORTUGAL
STRATEGIC OBJECTIVES FOR A DECADE 2030

• Promote economic growth and the creation of skilled jobs in Portugal by promoting space-related markets;

• Foster the generation of satellite data through new space Technologies and space-related infrastructures in Portugal with emphasis on new space industries (New Space);

• Contribute to the development of the country taking into account the advantages of Portugal’s geostrategic position of space activities;

• Ensure the development, internationalization and evolution of the legal, financial, institutional, cultural/educational framework for boosting the development of the Space sector in Portugal through national initiatives and international cooperation
STRATEGIC AXES

1: Boosting the exploitation of space data and signals through space-based services and applications, promoting new markets and highly-skilled jobs

To Foster the data exploitation:
  • Through the services and space applications;
  • Promoting new market for space
  • Promoting qualified job;

2: To Foster the development, construction and operations of space infrastructures:
  • mini, micro and nano-satellites
  • Launcher services
  • Increasing the current space-based monitoring earth observations infrastructures;

3: Reinforcing and strengthen national competences in the space sector:
  • Innovation and R&D;
  • Education and scientific outreach
Portugal Space: Founding Members

Governo dos Açores

FCT Fundação para a Ciência e a Tecnologia

ANI Agência Nacional de Inovação

Recursos da Defesa

Private non-for profit
• An old ambition from the Industry and National institutions
• Recognize the space sector as a pillar of economic and scientific growth
• A close look at the opportunity of the moment (new space)
• A country qualification need
• Greater attention from the new student generation
• A responsible and sustainable look at space utilization

... a journey of 20 years
To make Portugal as a Space Nation
Focus in the Atlantic
The Portuguese Atlantic Platform

The heart of the North Atlantic Ocean

Strategic location: a raw material to exploit
Many things happen here every day.

The North Atlantic region links the Americas, Europe and Africa continents.

And brings new challenges and needs:
- Environment Monitoring
- Abnormal behavior
- Piracy
- Tracking good
- Safety trading
- Climate
- Comms (Gateways)
- VLBI (Geodetic Interferometry)
AI Moonshot Challenge

Combining AI with emerging space technologies to solve a major problem in Climate Change.

€500K award will be given to the winning team to perform further research in Portugal.
Democratization of Space
Foster responsible use of space

„Space Sustainability“
Space and Non-Space
Interligação de estratégias:

- Portugal AI 2030
- Portugal Advanced computing 2030
- Portugal Space 2030
Space = Infrastructure and Enabler
Diversification of Platforms to Address User Needs
New Markets for Nano/Microsatellites
Public Pays Permanently

→ YOUR BUSINESS
POWERED BY SPACE
Public Pays Permanently
Future Business Models?
Future Customers?
Future Business Partners?

 YOUR BUSINESS
POWERED BY SPACE
Constellations
- Comm/PNT/EO
- Revisiting time
- Resolution
- Frequencies

Upstream
Downstream
Hybrid
Autonomous Shipping

Illegal Fishing

Maritime Piracy
Guiding Principles

- balance consolidating and continuation of acquired and proven competences with investments in new fields of growth and new markets;
- develop subsystem and system competence to increase the Portuguese presence along the whole value chain (in a European context);
- stimulate user uptake – commercial and institutional – including the user in the strategic definition process;
- concentrate main efforts in a few strategic fields and support other fields by opening opportunities to businesses;
- build strong international partnerships;
- build synergies between national-ESA-EU funding for space and other sectors;
- increase the science output in all fields.
Comprehensive Innovation Policy + Extensive Capacity Building

- political will and climate
- sound overall configuration
- variety of instruments
- fair (start-up) loans
- acceptance of failure
- access to competition
- access to information
- access to infrastructure
- networking & partnerships
- fair competition
Small-sat EO constellation
Future goal: ubiquitous connectivity

5G
Air Traffic Management
Space Tourism
Space Weather Impacts on Infrastructure

- Astronaut radiation
- Radiation damage, charging/discharging
- Solar cell degradation
- Increased radiation doses in aviation
- Satellite navigation errors
- Increased atmospheric drag
- Telecommunication disturbances
- Geomagnetically induced currents in power grid
- Errors in directional drilling
- Aurora
Lagrange Point 5 forecasting

Earth Orbit nowcasting

1 Au = 150,000,000 km
Collision Risk Estimation and Automated Mitigation (CREAM)
AI for e.g. Earth Observation

New Technologies
Forest Fires
Optimisation of Energy
Natural Disaster Forecast

Earthquake Magnitude (ML)
- <1.5
- 1.5-2.0
- 2.0-2.5
- 2.5-3.0
- >3.0

LOS Displacement
- +15.0 cm/yr
- -5.0 cm/yr

credits: Fcumelis et al. 2013, GJII
Development of Drought Resistant Plants
Smart Cities
Coastal Erosion
Democratisation of Access to Space
Cost of Access to Space

→ Price does not scale linearly with size

→ A microlauncher is much more expensive than a large launcher in terms of €/kg
Spaceports in Europe

The European spaceport: Kourou

+ 3 other spaceports for microlaunchers under development with considerable competitive advantage

+ Santa Maria

+ more under discussion (e.g. RO)
75 known microlauncher concepts worldwide
1 flown, only a few financed

Many spaceports developing worldwide
Enable access to Space from the Azores, in order to develop space activities in Portugal and enable a new generation of launch services for future markets worldwide – public and private alike
1500 km
The Spaceport is to be built on the island of Santa Maria.
Space Activities from the Spaceport are to start in 2021
The Spaceport is to be an Open Spaceport
Satellites and debris in low Earth orbit, 1960-2010. Courtesy NASA.