

Prime Minister's Office

Government guidelines on space and aerospace

1. Introduction

Space and aerospace are two fundamental and strategic sectors for the country's interest, both as concerns all the services and applications which may be offered to national users and foreign markets, and for the great impetus towards the domestic industry's scientific research, technological progress and development and production capacity.

Through its domestic programmes, bilateral cooperation and the participation in international projects, Italy is one of the few countries in the world to have a space and aerospace sector characterised by a complete supply chain of products and services. A significant strategic autonomy which has allowed the domestic industry to develop an excellent competence and a truly valid competitiveness on the international market for developing and achieving products and services for the space segment, i.e. the *upstream sector* (launch services, satellite development and production, infrastructures, *payloads*, sensors, inhabited modules, robotics, etc.), the ground segment i.e. the *midstream sector* (operations, security, terminals, etc.), and the chain of services and applications, i.e. the *downstream sector*.

The latter, generated by the space and aerospace systems, are used by the Country's central and territorial Institutions in order to support policies concerning environment, climate, safety, defence, the control of the territory, infrastructures, cultural heritage, the agricultural, forestry and fishing industries, the air/sea spaces, contributing - on a general level - to improving the conditions and quality of life of its citizens; moreover, they provide momentum to scientific research, technological progress and diplomatic initiatives.

By introducing articles 4 and 189 in the Treaty on the Functioning of the EU in 2010, the European Union has also become aware that Space is a strategic resource, intensifying its efforts to acquire an autonomous capability to provide satellite services, even attributing a direct jurisdiction on the matter to the Institutions of the Union, albeit shared with that of the Member States, and providing for the establishment of appropriate relations with the European Space Agency.

The space sector has long been subject to rapid change; in particular, it is evolving from a specialised excellence sector to a *commodity one*, broadening the field to system

developers, in which COTS¹ and application services are increasingly used. The sector also records a growing interest on the part of large companies, SMEs and *Start-ups*, increasingly reducing times and methods of implementation.

2. The new *national governance* for space

Law no 7/2018 reformed *national governance* by conferring the key management, the general political responsibility and the policy coordination of all the Ministries involved in space programmes to the Prime Minister, and by establishing the "Inter-ministerial Committee for space and aerospace-related policies" (COMINT). The Committee has the task of elaborating the governmental and industrial strategies in view of facing the new challenges which derive from security requirements or from new developments (such as, for example, *Internet of Things*). COMINT - through a constructive and functional coordination between the various Ministries concerned and the Presidency of the Regional Governments, with due regard to the institutional powers of each member - considers it necessary to define:

- an **industrial policy which also supports new technological production chains in the space sector**, capable of defining priorities and the related level of ambition for the specific associated programmes, enhancing the expertise acquired by the domestic production sector and underpinning its competitiveness on the international market;
- a **programme able to attract capital** and to encourage and facilitate access to finance - through the development of regulatory instruments compatible with EU competition laws - with particular reference to SMEs and *Start-ups*, favouring the development of the technological, financial, regulatory and *governance* aspects functional to the increase of private capital;
- a **space diplomacy** which envisages strengthening international cooperation and national supervision at the highest institutional levels of all the international organisations in the industry, in order to ensure a constant and influential Italian presence, through active participation in the United Nations, ESA, European Commission and in joint programmes with NASA and the Space Agencies of other countries;
- a **multiannual programme** — in financial and programmatic terms — which is

¹ *Commercial off-the-shelf products* i.e. *hardware* and *software components* available on the market.

consistent with the medium-long term time horizon, necessary for the development and implementation of space programmes, increasing national strategic capabilities for the "National Economic System", international collaborations and strategic alliances;

- a **plan to promote the applications and use of space technologies** in diversified institutional and commercial contexts, maximising the use of infrastructures and of innovations derived from the space industry in favour of national institutional and commercial users and as a potential offer to foreign markets, including developing countries with which Italy can take on a leading role;
- a **National Strategic Plan for Space Economy** in order to enhance and implement what was started in 2016, taking into account the public-private partnership approach, with the objective of promoting and progressively increasing private participation in sector investments, encouraging the commitment of central and local administrations (so-called *Buyer Groups*) to acquire products / services developed by *Public-Private-Partnerships*;
- a **National Security Space Strategy** which - whilst recognising the need to guarantee an adequate level of continuity in the provision of services and applications to institutional and commercial user communities - enables acquiring an adequate intrinsic resilience of space infrastructures towards natural events (accidental collisions of satellites with dangerous debris and *space weather*) or intentional threats (physical, computer and electromagnetic ones) to orbiting and terrestrial systems. Within this framework, the qualifying factor is to establish and maintain *Space Surveillance and Tracking* over time, as prelude to the *Space Situational Awareness* and to the broader *Space Traffic Management* which must be pursued, implemented and preserved over time, including to monitor the uncontrolled return of objects and space debris;
- a **plan for enhancing national resources**, which envisages the promotion, at an international level, of operational and research centres spread over the national territory and a strategy in order to position qualified Italian representatives in key and top roles of the most important international organisations;
- a **development programme of the *upstream sector***, functional to the creation of innovative "enabling and operational" products and services, increasingly in line with the needs of the market and of public and private users;

- a **development programme of the *midstream sector*** which allows to implement effective and functional ground infrastructures suitable for data acquisition, processing, storage and distribution;
- a **development programme of the *downstream sector*** which satisfies the growing demand for space applications, stemming from central and regional institutions as well as commercial business, achieving full integration with non-space services, including - for example – by means of applying *Machine Learning* (ML) and Artificial Intelligence (AI) techniques and contributing – at the same time - to reducing the *digital divide*.

3. Domestic strategic sectors for space and aerospace

In the light of the foregoing, the sectors on which it is necessary to focus attention and efforts given the importance of the potential effects and applications are, in order of priority:

- **telecommunications, Earth observation and navigation**, whose satellite services and applications (so-called *downstream ones*) will be used by citizens and enhanced by the Institutions in order to implement national policies concerning safety (including food safety), defence, environmental protection, national cultural and landscape heritage protection, continuous monitoring of the agricultural, forestry and fisheries system and of critical infrastructures and structures, as well as of the National Civil Defence Service;
- **the study of the universe**, also by joining international cooperation programmes, *primarily* with ESA and NASA; in all these fields, Italian research ranks as excellent, having gained an internationally recognised *leadership* in achieving important scientific and technological instruments. The repercussions of this line of research are not limited to the general advancement of global knowledge of the universe, but since they are frontier studies, the developments and solutions to the various challenges will also spill over to other sectors, as advanced technologies which will improve citizens' lives and national industrial competitiveness;
- **access to Space**, an ability which is indispensable for a credible space policy, currently already part of the Domestic Industry's expertise which has created a carrier - Vega, which is developing its evolutions in order to increase competitiveness, including launch services for mini, micro and nanosatellites - for which commercial

usability must also be protected; in this context, platforms for entering space and returning to the earth based on *payloads* of a scientific, dual and technological nature are of special interest, with the aim also of offering competitive services on the international market;

- **sub-orbital flight and stratospheric platforms** in order to acquire a national technological and industrial capacity in stratospheric and sub-orbital flight, thanks to the possibilities which aerospace can offer, also using the capacity provided by potential national spaceports, the first of which has been located in Grottaglie;
- ***in-orbit servicing***, including capabilities concerning satellite *de-orbiting*; the possibility of intervening with ordinary and extraordinary maintenance operations on orbiting satellites appears as a new frontier of space activity; the applications of this technology are many and their economic interest is evident; this involves the study and development of *low-thrust* propulsion, identification, *tracking*, *docking* and intelligent robotics systems;
- **robotic exploration** of the Moon, of asteroids, planets and their satellites; all the Space Agencies are engaged in planetary robotic exploration programmes, which must necessarily precede any human exploration and colonisation programmes of the solar system; the national scientific community, in collaboration with the Italian Industry, has gained a leading position in achieving remote and in-situ investigation instruments which have been successfully installed in missions carried out mainly by ESA and NASA; the same original technologies - and their subsequent evolutions - will be able to effectively contribute to robotic exploration missions, with important returns in terms of knowledge and cutting-edge technological development;
- **human space exploration**, maintaining the role of excellence acquired by Italy in the field of scientific research and industrial capabilities; it is therefore considered appropriate:
 - to consolidate participation in programmes concerning the International Space Station;
 - to guarantee an important role in the Lunar gateway, including through ESA, bilateral cooperation (*primarily* with NASA) and possible commercial initiatives;
 - to evaluate the opportunities offered by future human presence on the surface of the Moon;
 - to strengthen cooperation in human spaceflight also through further opportunities

with new partners, such as the Russian Federation and China, with which a collaboration has been under discussion for some time within the scope of the future Chinese modular space station.

4. Subsequent Documents

In accordance with Law no 7 dated 11 January 2018, the Italian Space Agency (ASI), based on the Government guidelines on space and aerospace matters, will prepare the draft of the "Domestic Space Policy Strategic Document - DSPSN" which will be appraised and subsequently approved by COMINT, as well as the consequent – at operational level - "Space strategic vision document - DVSS".

THE PRIME MINISTER

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