



European Space Policy Institute

## Europe and Human Spaceflight: new context, new strategy?

### 1. *Toward a change of paradigm for human spaceflight?*

Although European astronauts have travelled to space more than 60 times onboard Russian and American rockets, Europe has never fully developed its own capability to launch astronauts into space. Options to develop human-rated space transportation systems have been considered several times in Europe over the last decades but the lack of political consensus among Member States on the strategic relevance of such endeavours, as well as disagreements regarding funding have driven these plans to an impasse. The ill-fated Hermes spaceplane, an optional ESA Programme led by CNES that was cancelled in 1992 due to continuing delays and major costs overruns, has been a traumatism that contributed to discouraging subsequent attempts to develop human spaceflight systems in Europe.

Notwithstanding, 60 years after Yuri Gagarin's first flight, the lack of autonomous European capabilities in the field of human spaceflight is a matter that periodically returns to the forefront of space policy debates. With the future of Europe's strategy for access to space under the spotlight, several top-level executives have again raised the question of Europe's capabilities to launch astronauts. Indeed, some recent developments may point to a possible change of paradigm for human spaceflight or, at least, to a change of landscape that would justify a fresh debate on this important topic in Europe:

- **Space has become an environment for long-lasting human presence**

Unlike the ISS that had a limited lifetime in orbit, programmes currently under development offer long-term perspectives and will require decades of efforts before objectives are fulfilled. Therefore, we can reasonably assess that human spaceflight is now being set on a permanent footing and should no longer be considered a temporary need to achieve a specific objective. All major space powers are envisioning such capability as a permanent feature of their space transportation strategy. The renouncement of Europe at this point in time might thus be definitive and irreversible and would certainly be determinant in its capacity of leadership in space.

- **Cislunar space is a clear destination for space exploration**

So far, Low Earth Orbit seemed the ultimate destination for human spaceflight, with the sole objective to service the ISS. Investing in a Europe-made manned transportation system was therefore difficult to justify given the existing capacities available worldwide to reach this orbit, with the Shuttle on the U.S. side for the deployment phase and later on, the Russian Soyuz vehicle for routine exploitation.

However, with the advent of new space exploration projects towards the Moon, and towards Mars at a later stage, cislunar orbits are now set to become the privileged destination for most manned and robotic flights. Furthermore, these developments raise the bar to an unprecedented level and the needs in terms for both freight and manned space transportation will require an international effort to which Europe needs to decide whether it wants - or not - to contribute.

- **New commercial and industrial dynamics have implications for launch service markets**

The commercial and industrial dynamics of human spaceflight are profoundly changing, with serious implications for the space launch sector at large. As a result of the service-oriented procurement approach implemented by NASA, the development of private human spaceflight capabilities, including

space tourism, has become a key driver for launcher developments in the U.S., stimulating considerable private investment and blurring the lines between commercial and institutional markets.

Attracting private investment in Europe to contribute to the development of such capacity could be considered in the framework of innovative Public-Private Partnerships supporting both long-term public perspectives and commercial objectives. Taking advantage of the current window of opportunity could leverage the public investment in this domain.

## ***2. A demanding endeavour and a decisive decision to integrate human spaceflight into the European space transportation strategy***

Throughout the past decades, Europe has based the economic viability of its space transportation strategy on capturing large shares of accessible global demand and European industry has been especially successful in addressing GEO markets. However, the emergence of new aggressive competitors, as well as the advent of new generations of space telecommunications systems have deep implications on the global demand for launch services and will inevitably question the resilience of this model. In this context, the key issue of the competitiveness of the European offer will need to be addressed in the short to medium term.

Additionally, major trends in space transportation industrial and business strategies, as well as in international programmes and commercial launch markets, are changing the dynamics of human spaceflight with potentially far-reaching implications for the broader domain of access to space. Yet, much is at stake for Europe as stakeholders are actively considering the future of their strategies and programmes in this domain. Ultimately, human spaceflight is poised to become an increasingly important factor for Europe's competitiveness on commercial launch markets and for Europe's role in international programmes. This prospect seems to be considered seriously by European actors and several top-level officials have already called on Europe to reevaluate its approach to space transportation.

Enlarging the scope of missions to include human spaceflight capabilities would affect all the key factors impacting the competitiveness of European launch service providers:

- **Reusable technology:** Major international competitors leveraged new public strategies including demand for human spaceflight to develop reusable launchers able to launch both satellites and crew/cargo capsules.
- **Industrial organization:** Human spaceflight is a catalyst for new approach based on long-term commitments for service-oriented procurement that could trigger a more efficient industrial setup.
- **Sustainable demand:** An enlarged customer base could contribute to the improvement of the competitiveness of the sector.

As demonstrated by the success of the U.S. Commercial Orbital Transportation Services (COTS) programme, such investment must be first justified by new public ambitions in space exploration and international programmes and then facilitated by clear synergies between institutional goals, commercial interests, and industrial strategies. In this regard, the current space ecosystem offers new options to foster these synergies, share costs between public and private stakeholders, and distribute development costs over time, as part of an adapted service-oriented procurement. On top of that, now that private actors, such as Blue Origin, have demonstrated that development costs for such capabilities have progressively decreased, new industrial management frameworks should make it affordable for Europe. The engagement on the development of autonomous human spaceflight capabilities must also be part of a strategic vision considering the risk posed by Europe's full dependence on foreign commercial service providers.

For the time being, the most difficult decision is probably convincing European Member States to agree to open this file once more in light of the recent developments of space transportation worldwide and to consider with a fresh look the stakes ahead regarding access to Space.

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Schwarzenbergplatz 6 • A-1030 Vienna • Austria  
Tel: +43 1 718 11 18 -0 / Fax: -99  
Email: [office@espi.or.at](mailto:office@espi.or.at)

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