



Executive summary



The space sector is currently experiencing major technological, economic, geopolitical and defense-related evolutions, on the global scale but with strong implications for Europe's future. This large topic includes access to space through launchers (rockets),

activities in space (mainly satellites), Earth-based activities closely linked to space (for example equipment using GPS or telecommunication satellites) and scientific exploration (satellites and probes exploring the solar system).

In the field of launchers (rockets) - the most visible space activity for the general public -, new American private companies aim at changing the equation of access to space, with very active support from their government. They are betting on an economic and technological disruption: reusability - which consists in recovering and reusing key launcher components instead of discarding them after a single use (the current industry standard). Though its global economic equation remains to be confirmed, the relevance of this new model is now clear. Reusability could very well trigger a significant cost reduction for access to space in the next few years, and possibly a massive reduction by 2030.

SpaceX, created by Elon Musk, is currently leading this trend towards reusable launchers and has overcome major technological hurdles in 2017 by reusing both the first stage of its Falcon 9 rocket and the Dragon capsule (used to supply the International Space Station). SpaceX is far from alone however, since Jeff Bezos, the founder of Amazon, has created his own company (Blue Origin). By selling Amazon shares, Bezos is investing as much if not more than Europe in its new launcher (approximately US\$1 billion per year) which is set to enter the market in the early 2020s.

This paradigm shift is only the more visible aspect of ongoing transformations. Such transformations stem from technological advances, in particular the digitalization of the global economy, the miniaturization, and lowering costs

of satellites. They are encouraged by the foreseen impact of launcher reusability. This in turn opens the way to new services such as global internet access through satellites, the combination of Earth observation and big data, in-orbit manufacturing and even space tourism. Not far beyond, the exploitation of space resources, such as water or minerals, could also form part of a new space economy in the coming decades. American companies are already developing related technologies and planning space missions.

Recent studies estimate the global space economy will grow from about US\$260 billion in 2017 (already twice the figure of 2007) to US\$1,100-2,700 billion around 2040. In the same way GAFAs emerged from the digital revolution in the 2000s to play a dominant role - all American -, future leaders of the space economy are already taking shape today. Simultaneously, all major spacefaring nations are actively developing military space programs and capabilities, with budgets far superior to that of Europe, which lacks coordination.

Embarked on a more traditional State-controlled path, China has set new goals for its space program in 2017. The country now intends to outpace Europe quickly, before setting its eyes on overcoming the United States in the coming decades. Though China already launches two to three times more rockets than Europe every year, its public space budget (both civil and military) is also rapidly increasing. It has recently announced reusable rockets demonstrators for 2020 and is already at the cutting edge of space technology in some advanced fields such as satellite-based quantum telecommunication. Not only is China now eyeing commercial launches (primarily in Asia) for its launchers and (nascent) satellite industry, but new private companies are also beginning to emerge.

In this fast-changing landscape, choices made by Europe were designed to be pragmatic but result in significant vulnerability, when compared to main competitors.

In the field of launchers, Europe decided in 2014 to go ahead with Ariane 6 using proven technologies, reducing costs, simplifying the project's governance and taking into account market evolutions. Nevertheless, faced with fierce competitors, there is significant uncertainty as to whether the

future launcher - a non-reusable launcher - will be competitive enough to maintain the current European leadership in commercial launches (launches that are open to competition) in the 2020s, especially as its domestic government market is already two to three times smaller than that of the US, China and Russia.

In addition, European space governance struggles to respond quickly and efficiently to faster-than-before changes: it remains divided between European (EU), intergovernmental (ESA, EUMETSAT) and national (governments and space agencies) levels. It also imposes the allocation of production capacities among countries based on their financial contribution (so-called rule of “geographical distribution”

or “fair return”). Finally, as in other industries, there are numerous new European players (startups) in the space field but recent figures show that they find it difficult to raise sufficient funding and lack market depth to compete effectively, in particular with American counterparts. Unless Europe responds to these challenges quickly, it will not be at the forefront of global space powers in the 21st century. The ongoing discussions about the future of the European Union are a unique opportunity for Europe to determine its space agenda and to assert genuine space sovereignty, as part of an ambition to be a global leader. Choices made in the next few months and years will have a lasting impact beyond the space sector, on defense and security, on the daily life of European citizens and on the continent’s future prosperity.

Our proposals

Additional efforts should be undertaken now, spanning all aspects of space:

Proposal 1: Publicly assert Europe’s ambition to be the main space power by 2030. The first step is to acknowledge what is at stake and, once a consistent strategy is defined, it should be publicly announced at the highest European level, initiated by leading countries, mainly France and Germany, but also Italy.

Proposal 2: Accelerate the ongoing optimization efforts and Ariane 6’s commissioning. At a time when Ariane 5’s operational life is nearing an end, weakening Ariane 6 would endanger the very existence of Europe’s launch sector and Europe’s independent access to space.

Proposal 3 : In parallel to Ariane 6, master as soon as possible the main technological building blocks of reusability, starting with rocket engines. The goal would be to develop a fleet of reusable launchers as early as possible in the 2020 decade, with increasingly lower costs.

Proposal 4 : : Introduce a “European preference” mechanism for European and national institutional launches. Equivalentents are already in force in the United States and China. This measure is consistent with required additional efforts in terms of competitiveness, investment and innovation.

Proposal 5 : Obtain a significant increase of the European Union’s space budget, starting with the negotiation of the Union’s next multiannual financial framework, for concrete projects to be defined rapidly. Such projects could include civilian (space-based internet, cleaning Earth orbit, manned spaceflight, etc.) and military applications (observing and defending European satellites in orbit).

Proposal 6 : Reorganize European space governance. Space-related issues must be increasingly managed at the European Union level, giving space policies stronger visibility in EU institutions (European Council, Parliament, Commission). Commercial practices of Europe’s competitors, which include offering artificially low prices on the international market to attract clients, should be monitored closely.

Proposal 7 : Promote the entry of new private actors in Europe, through innovative public-private partnerships. Such partnerships have been and will remain instrumental to the current American dominance in space, and would maximize the efficiency of additional public investments in space.

Proposal 8 : Improve European communication on space, both by political leaders and by companies.