



European Space Policy Institute

Measuring Space Power

A theoretical and empirical investigation
on Europe

Executive Summary

Prepared by the
European Space Policy Institute

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Is Europe a Space Power?

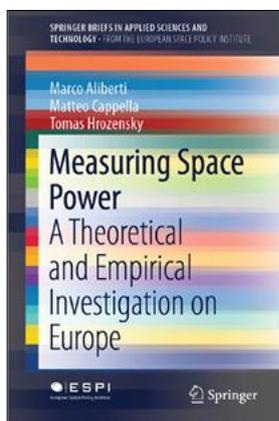
Speaking at the 9th annual Conference on European Space Policy in January 2017, the EU High Representative for Foreign Affairs and Security Policy, Federica Mogherini, highlighted that “Europe can be and should be a space power”. The High Representative also made clear that this objective was to be pursued for several political, economic and security reasons, but could be achieved only by “acting together, as a true Union”.

A few months later, in her keynote speech at the Space Symposium in Colorado Springs, EU Commissioner Elżbieta Bieńkowska provided the audience with a different message. She stressed that “Europe has always been an important space power”, and that through the new European space strategy, Europe has set its “vision and ambition for space: to remain a space power and to embrace the challenges ahead”.

The apparent mismatch in the views expressed by the two EU commissioners not only underscores a possible discrepancy in the assessment of Europe’s situation in space, but more broadly raises several questions regarding the very notion and constituent elements of space power. What are the key features defining such status? Are there specific criteria to be used for differentiating a space power from a lesser space actor? And how can they be empirically measured and assessed? Eventually, can a hierarchy among space actors be established on the basis of these criteria?

Within the body of the space power literature these questions have not been fully answered. This is not surprising considering that debates around the meaning and nature of space power have yet to reach a consensus on this concept. As of 2018, there is still no widely accepted definition of space power, let alone a comprehensive theory explaining its exact significance and implications. Equally important, for understandable reasons, the literature has focused mostly on the United States and Russia so far. The case of China also raised some interest more recently, in relation to China’s space achievements and its openly asserted resolve to be “a space power in all respects”. Europe, for its part, emerges from the literature as a complicated and intertwined tangle of relations, institutions, and national interests; a unique regional power usually perceived as an important actor of the global space arena.

The European Space Policy Institute (ESPI) examined whether Europe, through its various constituents, can be considered a space power with the objective to understand the implications of its actual status and position within the international space arena. To do this, the research team developed a methodology to define and measure space power thanks to measurable indicators. To do so, the team analysed the conditions required to reach and maintain the status of space power and investigated the major political, security, and socio-economic stakes at play. Building on this, the team performed a comparative assessment of the major space actors, with the underlying objective to examine Europe’s relative position in the global space arena and to put into perspective European space power ambitions with the necessary means and resources required to meet this goal.



Marco Aliberti, Matteo Cappella, Tomas Hrozensky

SpringerBriefs from the European Space Policy Institute

This new ESPI book offers an innovative framework to measure and compare the status of worldwide space actors within the space arena. The overarching objective is to reflect on Europe’s relative position and put into perspective its proclaimed goal to assert itself as a space power, with all of the means and resources this would entail. With its unique scope, the book represents a valuable and versatile tool to support European decision-making and offers key insights for executives, space professionals and scholars alike.

Measuring Space Power

Although extensively used in space policy discussions, there is still no widely accepted definition of space power, but rather a plethora of different and sometimes diverging meanings. In addition, most definitions and theories focus on the capacity dimension of power, rather than the actor detaining such capacity, thus making empirical assessments and comparisons between different countries inherently difficult.

The study shifts the analytical perspective from a capacity-oriented approach to a status-oriented approach. Towards this, the study provides the following definition of a space power: **any entity with the ability to autonomously deploy, operate and benefit from any space-related capability to support the achievement of national objectives.**

From this definition, several important considerations emerge:

- First, only nation-states can acquire and maintain the status of space power. While the definition theoretically opens the status to non-state actors, it is clear that only nation-states have the means to master the full spectrum capabilities.
- Second, whereas the definition of space power remains unvaried over time, its constituent elements evolve as a function of technological development, the ever-expanding scope of space activities as well as the relative positioning of other actors in the space arena.
- Third, the definition enables the determination of an intrinsic set of requirements setting the threshold separating space powers from other types of space nations. The definition, more specifically, highlights two crucial features defining space power status, here referred to as autonomy and capacity.

Drawing upon political science literature, we can elaborate that a state reaches the status of space power if two sets of conditions are met, as summarised in Fig. 1.

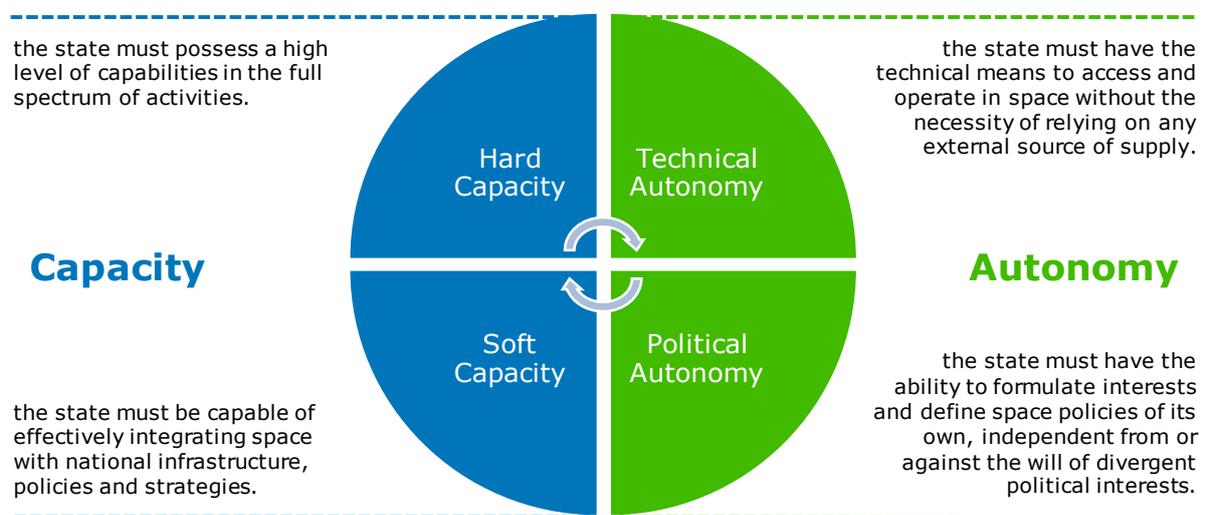


Figure 1: Space Power Requirements

The extent to which these conditions are met by different countries varies and determines the relative status and overall position of a given country in the global space arena. Some countries for instance, may score well on both the capacity and autonomy dimensions, while others may not meet any of the two sets of conditions. Between the two poles, there may be countries possessing only some attributes with respect to either the autonomy or capacity dimensions. Given these variations, the question becomes **how to evaluate and compare space actors' capacity and autonomy to position them on a global space power map.**

To perform this comparative evaluation, the compliance of countries with space power criteria has been measured along 4 indexes, themselves based on 64 quantitative and qualitative indicators. More specifically, capacity has been evaluated on the basis of a hard and soft capacity index, while autonomy has been measured on the basis of a technical and political autonomy index.

- The **hard capacity index** (based on 31 indicators) assesses the quantifiable assets and abilities that allow an actor to operate in, through and from space across the full spectrum of existing space activities.
- The **soft capacity index** (based on 16 indicators) measures the state's capacity to effectively utilise and integrate assets and expertise in national policies, infrastructure and activities.
- The **technical autonomy index** (based on 10 indicators) evaluates to which extent a state has the means to access and operate in space without relying on external sources of supply.
- The **political autonomy index** (based on 7 indicators) gauges a state's ability to formulate interests of its own, independent of or against the will of divergent political and societal interests emanating from both inside and outside the country.

In order to bring together different indicators, a score (low/medium/high) was attributed according to predefined qualitative/quantitative threshold taking into account that the status of space power is relative (to other countries) rather than absolute. As a result, the scale defines the positioning of the considered actor with respect to the two sets of conditions (capacity/autonomy indicators) and relatively to other actors.

This approach allows to combine the two constituting dimensions of space power in a matrix (see Fig. 2). This offers a graphical representation of a state's level of capacity (axis Y) and level of autonomy (axis X) but also a comparative mapping of different countries' situation.

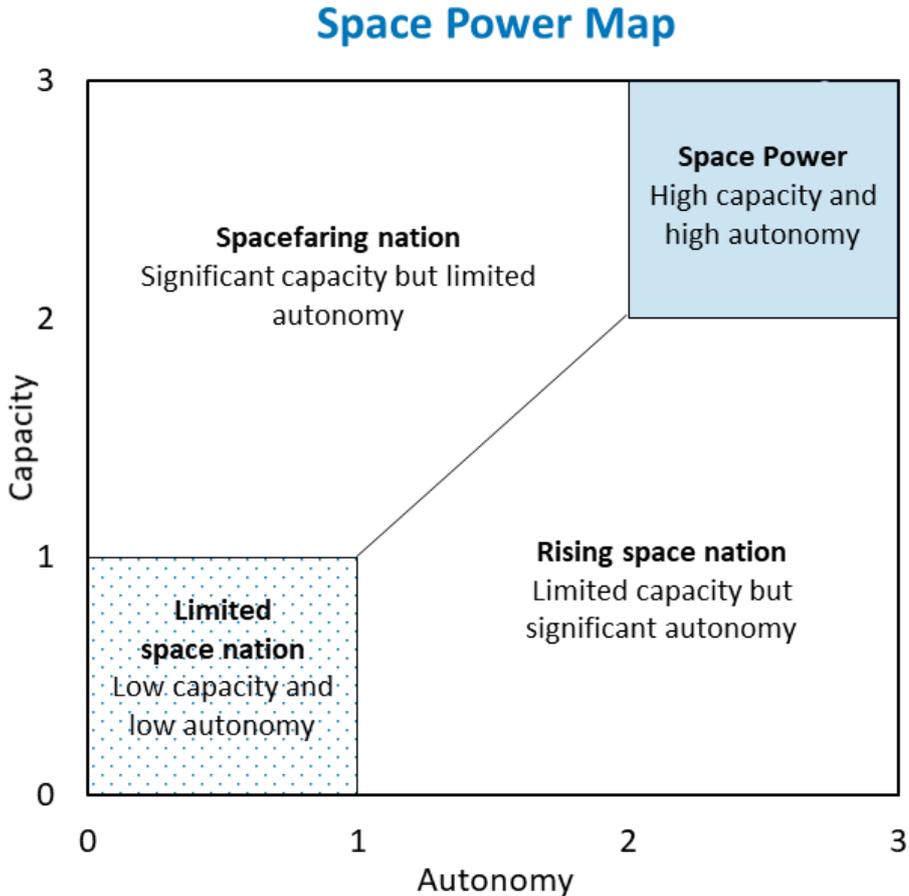


Figure 2: A Conceptual Map of Space Actors

The peculiar characteristic of this matrix is that it can be ideally divided by lines of demarcation that separate among a low, medium and high level of capacity and a low, medium and high level of autonomy. The matrix enables to locate and differentiate space actors along four possible quadrants, each corresponding to a specific status. In the upper-right quadrant, we find states endowed with a high level of capacity and autonomy that, consistent with the above provided definition, would fit the status of **space powers**. Conversely, on the bottom-left quadrant are states with a comparatively low level of capacity and autonomy, which can be ideally dubbed as **limited space nations**. All other more nuanced situations resulting from a combination of low and medium capacity and autonomy were grouped into two ideal-types: **spacefaring nations**, which are characterised by a level of capacity higher than the level of autonomy and **rising space nations**, characterised by a capacity lower than the autonomy.

From an empirical point of view, it is possible to locate the various space nations in the map. For instance, at a first glance it would be possible to argue that a nation such as the U.S., which has been heavily investing with great results in the full-spectrum capabilities, would fall somewhere in the high capacity – high autonomy quadrant. Vice versa, a state such as Nigeria, which only recently has expressed interest in space activities and possess only few capabilities, would fall somewhere in the low capacity – low autonomy quadrant.

Space Power Map

Building on the basis of this methodology, a comparative assessment of the major space actors worldwide can be performed. Results of the scoring are displayed in Fig. 3 below.

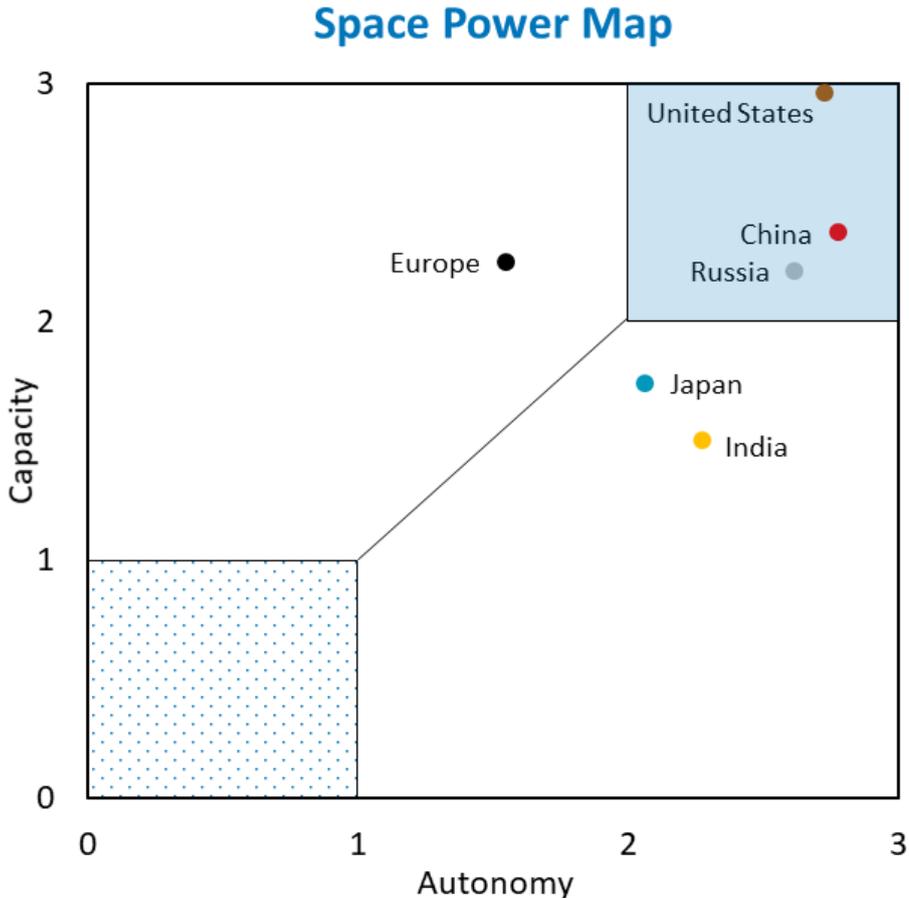


Figure 3: Positioning space actors in the space power map

Results of the scoring show that the United States, China, Russia fall within the space powers quadrant. With considerable autonomy but somewhat less capacity, Japan and India fall within the rising space nation quadrant, while Europe emerges from the analysis as an established "spacefaring region".



The United States stand as the country closest to the theoretically "ideal" space power, with "ideal" meaning a country that scores the highest in both capacity and autonomy, therefore appearing at the top-right of the matrix. With a long tradition of space activities, the United States build up capacities across the whole spectrum of activities, stabilized and mastered them. This, in turn, enabled a high level of technological and political autonomy, which was, on the U.S. side, protected and sought after by sound policies, forward-looking decision makers, and an overall solidarity among national stakeholders, interests and industries.



Since the beginning of the 21st century, China has been building an impressive set of capacities. It has stepped up the pace and versatility of its launch capabilities, continuously upgraded and polished its spacecraft technology, built operational satellite systems for telecommunications, EO, and navigation, entered the human spaceflight domain, reached the Moon multiple times and, lately, has been riding the wave of global private capital enthusiasm for space. China has been doing this in a situation of almost total autonomy, forced to develop in-house substitute technology, barred from exploiting the global demand, and partially isolated in terms of cooperation in space.



Russia's position on the map is the result of a space programme and an industry that was once prolific but now struggles to keep pace with new developments and foreign actors (most notably China). Albeit still a full-fledged space power, Russia has been slowed down by several mishaps such as satellites and probe failures, the (also literal) downward spiral of the Proton booster, the abandonment of the Ukrainian-built Zenit for political reasons, the delays in offering a substitute for the Baikonur Cosmodrome as well as the replacements for the five decades old Soyuz spacecraft and carrier. Russia still manages to show its influence and capabilities in space, but its space ecosystem is starting to appear ridden by inefficiencies, with a growing level of technological and financial dependence on foreign actors. Should the country continue on this path, the country may lose its space power status in the long term.



Slightly outside the space powers quadrant, Japan has been making its niche among the most active space actors. In spite of the budgetary cuts imposed by its plateauing economy, the Japan Aerospace Exploration Agency (JAXA) can pride itself with significant space exploration, science and human spaceflight achievements that are also marked by a high level of autonomy. More generally, Japan presents a strong, technologically advanced industry aligned and in pace with national goals, a thriving university environment working on space, and a political class that takes space seriously enough to link space policy decisions directly to the cabinet office, the agency in charge of implementing the Japanese's government policies.



Similar to Japan, India stands as a rising space nation. India has managed to develop its capacities autonomously, albeit not mastering all the capacities required to be considered a space power. The Indian approach has been generally associated with the utilitarian use of space to provide services and assistance to implement nation-wide socio-economic policies. So far, India has not pursued space activities for the sake of the status that follows. Things are progressively changing, though: with more high-profile missions related to space exploration and human space programme as well as a more active involvement in security and defence activities (as inter alia evidenced by the 2019 ASAT test).

Europe: from established Space Farer to full-fledged Space Power

Europe possesses a high level of capacity, both hard and soft, but a relatively lower level of autonomy as compared to other major space actors, a situation that positions the continent slightly outside the "space power" quadrant of the map.



A highly capable actor...

Having conducted space activities since the 1960s, Europe is one of the most experienced actors in the international arena and operates a highly regarded space programme. Through its different constituents (member states, European institutions, private sector), Europe has mastered a wide array of capabilities that address the whole range of space activities

In addition to its hard capacities, equally striking is Europe's ability to integrate space within its policy objectives, particularly socio-economic ones. From this perspective, European space programmes have been highly successful, with the space infrastructure now enabling and enhancing a plethora of other industrial and economic sectors.

...lacking autonomy

In spite of its wide array of capabilities, Europe fails to reach the same level of autonomy as its international partners or competitors. Remarkably, this is the case for both the technical and political dimensions of European autonomy over space matters.

European stakeholders still need to externally source a share of critical components, raw and advanced materials as well as some basic technologies and building blocks that are not available within European borders. Additionally, because of a tangle of relationships, institutions, and multi-level sharing of competences, Europe as a whole lacks the core features defining domestic sovereignty over space matters: i.e. autonomy in decision-making and effective control over policy implementation.

The considerations provided in the study underpin the conclusion that Europe cannot be considered a full-fledged "space power". The main evidence supporting this claim is the evident mismatch between Europe's high level of capacity and its low level of autonomy, with this latter dimension single-handedly preventing Europe from falling within the "space powers" quadrant.

Admittedly, its present position within the matrix is close to reaching the space power quadrant, a target that might be achieved in a reasonable timeframe, provided that proper processes are implemented. In principle, it may therefore be agreed that Europe can be considered a "space power in the making" rather than a spacefaring "nation". This is consistent, for instance, with the views expressed by the European External Action Service. However, the study shows that there is still no concrete evidence to support this assertion. A first element confuting this progression is the above-discussed sensitivity of Europe to the issue of autonomy and its business-oriented approach, for they produce an evident discrepancy between Europe's claimed ambition to assert itself a space power and the financial, infrastructure and policy means to fulfil this objective. A second, and more fundamental element is the still limited appetite of member states to consider strategic power in regard to European integration, be it in space or elsewhere.

All in all, Europe's business-oriented approach, its de facto acceptance of its state of dependency, and its limited taste for international competition and power considerations make it a unique case in the international arena, and ultimately raise the **question whether Europe should ambition to set itself as a full-fledged space power or should rather limit its ambitions to being a spacefaring "nation"**, although among the most powerful ones, and adapt its strategy accordingly. In any case, European space policy should aim to avoid that this singularity turns into a weakness.

Should Europe become a Space Power?

Considering Europe’s position within the space power map, answering the question of whether Europe should become a space power means answering the question of whether it is in Europe’s interest to ensure that its great capacities are endowed with an appropriate level of autonomy in its two dimensions – technological and political. To answer this, an assessment of the stakes associated with the pursuit of autonomy has been provided.

There are security, economic and political stakes associated with the pursuit and maintenance space autonomy. As summarised hereby, however, these stakes are not equally pressing from Europe.

Economic Stakes

Socio-economic considerations are of fundamental importance to any assessment of Europe’s future path, as these will most probably continue to represent the overarching theme of its presence in space. However, in looking at these stakes, it can be noted that Europe has been already harvesting and benefiting extensively from these. Additional economic benefits and returns on investment do not necessarily stem from the pursuit of technological autonomy. This is especially so when it comes to the development of critical technologies that do not have a sufficient level of recurrent use on the commercial markets. Admittedly, this is not to downplay the different economic risks that Europe faces by maintaining the *status quo*. Nevertheless, from an economic standpoint, what is critical for European industry is not technological autonomy *tout court*, but rather non-dependence – i.e. ensuring the possibility of having unrestricted access to -state-of-the art technologies. This is because the mechanisms driving technology in the direction of short-term competitiveness and commercial programmes are profoundly different from those driving technology for strategic reasons, such as autonomy. In short, from a pure economic perspective, moving to the right from spacefaring status to the space power status does not necessarily give rise to compelling economic incentives for Europe.

Security Stakes

From a security perspective, no actor with a minimum of strategic ambition in space can stand the consequences of a high level of dependence. This is equally true for Europe, even though the continent has, so far, tolerated a significant level of dependence on foreign technologies. However, maintaining the status quo for Europe would mean remaining at the mercy of external forces and accepting a higher level of vulnerability with regard to both *security of supply* (unrestricted access to required technologies, products, services or information) and *supply chain security* (control of security throughout the programme lifecycle). Conversely, becoming a space power would translate into greater industry and programmatic security, Thus, there are key security stakes behind a possible pursuit of space power status

Political Stakes

The major driver in fostering the position of Europe in the space power quadrant is anchored to this group of stakes. What is first and foremost at stake is European sovereignty over the conduct of its space activities. Indeed, Europe’s lack of autonomy may impact its freedom of action and ultimately restrict its capability to decide when and under what conditions to develop and deploy its space programme. In addition, by maintaining the *status quo* Europe may not enjoy the autonomy to freely choose its partners, due to possible external pressures. More broadly, what is at stake in this context is the long-term possibility for Europe to promote its position as a leader in space and strengthen its role as a global actor. Achieving and maintaining the status of a space power means having the leverages to build its leadership in the global space sector at large.

In fact, when linking the relevance of each of three groups of stakes to the above discussed specific policy drivers guiding past and current European space activities, a conundrum clearly emerges: as highlighted in Fig. 4, European efforts in space are primarily driven by economic considerations. Yet economics is not the overarching stake associated with the pursuit of autonomy.

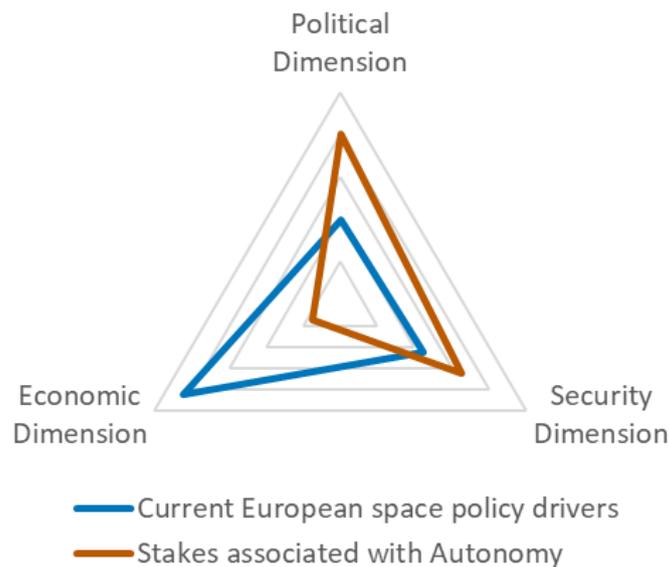


Figure 4: Drivers and Stakes - The European Conundrum

In fact, the pursuit of autonomy (and consequently of space power status) proves to be first and foremost related to strategic (i.e. security and political) considerations. Clearly, the decision to develop capacities – partially or along the full spectrum of capabilities, with a narrow or a wide scope – as well as the decision to do so with a high degree of autonomy or by relying on third countries' capabilities, is the result of a political process; a process that largely resembles the process that drives a country's decision to become a military power, or not. This means that any European decision in the direction of attaining space power status should be taken on purely political grounds.

From a political standpoint, achieving space power status is not only desirable, but also necessary, as what is at stake is Europe's political sovereignty over space matters and its declared objective to assert itself as a global player. However, even if the equation *no autonomy, no political sovereignty* provides a rather straightforward answer to the question of whether to aim at space power status, attaining such status is no easy undertaking. Quite to the contrary, the development and maintenance of such status is a capital-intensive process requiring not only sustained financial investments, but also the highest degree of political will and backing.

The current dearth in political will is a highly critical and potentially fatal factor in tackling the issue of autonomy. In view of that, the study then poses a new question: can Europe become a space power?

How can Europe become a Space Power?

For Europe, reaching and maintaining the status of space power essentially necessitates meeting two broad conditions:

- **Maintaining its capacity edge** through the sustained development of its hard capacities (i.e. upgrading of existing assets as well as identification, development and maturation of new capacities), and the integration of those capacities into national policies and infrastructure.
- **Establishing an appropriate level of autonomy** enabling Europe to develop and use its space programme without the necessity of seeking any kind of permission from anyone;

Each of these two conditions presents a number of cascading requirements, as briefly detailed below. With respect to the time aspect, the short-term need is more apparent with respect to the issue of autonomy. From a long-term perspective, the requirements are related to both conditions.

Maintaining High Capacities

Whilst Europe emerged from the capacity analysis with high scores, this is an achievement that, nonetheless, should not breed idleness or complacency. The ever-changing requirements associated with maintaining the status of space power create a need to continually improve Europe's capacity edge. Space technologies change, adapt and evolve, eventually allowing new types of space activities, new approaches to existing activities (cheaper, faster, more resilient...) and novel application and services opportunities to emerge. Hence, Europe must keep pace with global trends and potentially also be trend-setter in specific areas of spaceflight.

At this stage no conclusive assessment can be made on the extent to which currently emerging concepts such as reusability, in-orbit servicing, in-orbit manufacturing, or completely new concepts will impact the evolution of space power capabilities and the requirements to be met to attain space power status. However, it is clear that these requirements will evolve and broaden over time. This is an inevitable development of which European stakeholders need to be aware in order to act in a timely and appropriate manner.

Taking this into account, the study tries to visualize the trajectory of the capacity threshold in relation to Europe's position on the capacity matrix. Depending on how Europe's vision and efforts evolve, three broad scenarios can be envisioned (as depicted in Fig. 5): one in which Europe maintains the current programmatic profile, one scenario in which it reduces its space efforts, and one scenario in which it increases its efforts.

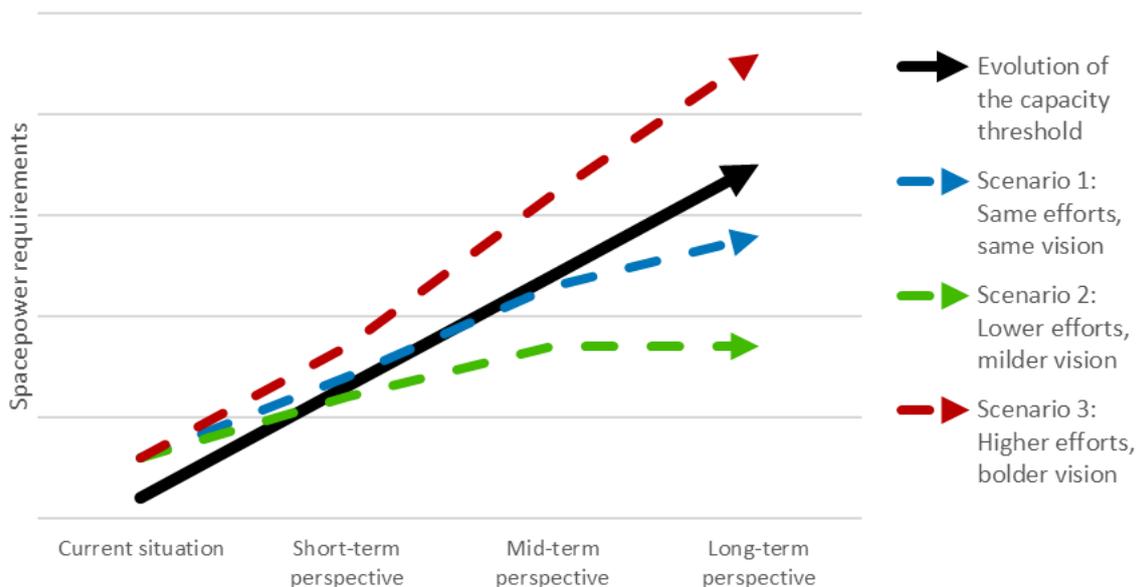


Figure 5: Evolution of the requirements for the space power status, potential scenarios for Europe

As the Figure makes plain, only by adopting a bolder vision for its space programmes, and hence investing in the development of new capacities and making a further leap in integrating these capacities for the fulfilment of broader policy objectives, will Europe be able to remain above the capacity threshold over the medium to long term. In this context, it is certainly gratifying to see the proposal for the next MFF (2021-2027) that was approved by the European Parliament in December 2018, which endorsed a substantial increase of the initially proposed amount for the SSA and GOVSATCOM components of the EU Space Programme. As both SSA and secure governmental satellite communications are integral parts of the hard capacity and soft capacity indexes, the implementation of the two programmes will certainly contribute to maintaining Europe's high level of capacity.

However, beyond these well-defined programmes, new and more ground-breaking avenues must be explored if Europe is to maintain a leading position in the space pecking order and ensure that it will be the instigator rather than a victim of future technological developments.

Achieving Technological and Political Autonomy

In attaining this objective, Europe will be primarily confronted with the need to tackle the longstanding problem of technological dependence and hence ensure that European industry will have unrestricted access to the state-of-the-art space technologies in each of the space application sectors. In this respect, the challenge for Europe lies not only in guaranteeing the simple availability of technologies from domestic sources, but rather ensuring these domestic technologies: a) have the required level of performance; b) have the right level of maturity to be available for application; and, c) are affordable.

For these aims, there is a clear need for a comprehensive and consistent space technology policy that will address the different requirements in all application areas; support the complete value chain; foster adequate maturity and readiness, target potential users.

While many initiatives and actions have been taken both within ESA and at EU level these have been focusing mostly on product concepts and the early stage of innovation, with a TRL between 1 and 5. However, later phases of the technological process (high TRL) should also be properly covered to ensure the ultimate availability of these technologies and relieve the users from the financial burdens and risks associated with the full qualification of the required technologies. Therefore, more attention should be given to the maturity and readiness aspects. This is a challenging task, since it requires harmonisation of potentially conflicting priorities as well as an institutionally-funded mechanism that can completely bring European technologies within an application or operational programme.

In addition to technology maturation, measures to support the eventual commercialisation of the matured technologies should also be provided, as it would be pointless to publicly fund the complete development of a new technology if it will not be eventually used as an alternative to available non-European sources.

Clearly, all these activities require a sustained financial effort on the public side, the establishment of sound industrial processes/facilities, and an authoritative institutional setting tasked with their operational implementation. While substantial, the effort proves within the realm of Europe's potential, provided there is a strong commitment on the political side. The question, once again, becomes whether European stakeholders are prepared and willing to pay the price for their autonomy.

In offering a conclusive answer to this question, it must first be acknowledged that commitment is present among all the major pan-European institutions (ESA, the European Commission and EDA). However, in light of the European governance framework, determining the operational body responsible for the implementation of these activities is a decision to be taken at the political level by member states. However, member states do not equally share concerns over the issue of autonomy – and ultimately European sovereignty. This clearly undermines the efficiency with which Europe can tackle the issue of technological dependence.

Overcoming this implies finding ways to offset these restrictions and to and skilfully craft an effective one-voice system capable of forging a common strategic vision for space matters. Incidentally, one proposal along these lines was recently made by European Commissioner Bieńkowska on the establishment of a European Space Council, attached directly to the European Council and gathering all the space decision makers. Arguably, by shifting the venue of discussions on Europe's direction and strategic ambition in space from the current ministerial level to the highest political level, a much-needed alignment of views among European heads of states and government and consequently a shared long-term vision for Europe in space could be reached.

The proposed European Space Council may hence prove an important stepping-stone towards emphasising the comprehensive strategic nature of the European space sector and, more importantly, filling Europe's autonomy gap in the political realm. It is also clear, however, that to achieve full political autonomy and attain its space power potential, a more ambitious political evolution of the overall institutional setting will be ultimately indispensable. As long as European member states do not jointly see the need to move beyond the current intergovernmental model and confer real autonomy over space matters to the supranational level, the possibility for Europe to become a full-fledged space power will inexorably remain untapped.

Concluding remarks

Europe is an established spacefaring region, but still lags behind full-fledged space powers in particular in terms of autonomy.

This study has made a comparative assessment of the major space actors worldwide. The underlying objective was to examine Europe's relative position in space and put into perspective its purported ambition to assert itself as a *space power* with the necessary means and resources required to meet this goal. From the empirical application of this methodology, Europe emerged as an established "spacefaring region". This is the by-product of the imbalance between Europe's high level of capacity (in both the hard and soft dimensions), and a relatively low level of autonomy in the technological and political spheres. While Europe can boast significant achievements in its space endeavours and is equipped with a highly capable and competitive industry in a broad range of space domains, it does not, yet, possess technological autonomy across the full spectrum of space capabilities and, more importantly, has only a limited degree of political autonomy over space matters.

Europe's path towards space power status is paved with major economic, security and political stakes requiring sustained efforts.

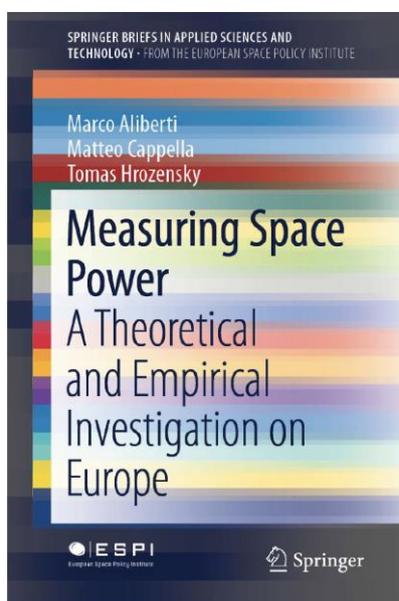
In translating this empirical evaluation into normative considerations, it is evident that Europe's current status carries an array of political, programmatic, industrial, commercial and diplomatic consequences and creates a number of risks for the European space sector over the long-term. These are further magnified by the mismatch between Europe's declared ambitions and the actual means to achieve them.

This mismatch calls for a revisiting of the overarching policy drivers of the European approach to space towards a more politically oriented profile, if Europe is to assert itself as a full-fledged space power.

The study also highlighted the many issues that would come with the quest for such status. These include: the need to put in place effective instruments to tackle the issue of technological dependence; the necessity of revisiting the concept of shared competency in space affairs; the need for a more ambitious agenda in the foreign, security and defence policy; and the need to address the reluctance of Member States to agree on any additional transfer of sovereignty towards European institutions in this area.

Making of Europe a full-fledged Space Power is a matter of political will. Perspectives on this issue are likely to evolve in the future.

Given these burdensome issues that must be overcome, it is clear that Europe's path towards space power status will be a lengthy process ultimately demanding a deeper advancement of the political dimension of the European integration project. Recovering unity of vision and action will be the key tool to fully attain Europe's space power potential. Eventually, Europe can be and should be a space power. Achieving this goal is deeply intertwined with the construction of Europe and its current political challenges (beyond the space sector).



Measuring Space Power

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