



# Russia's Posture in Space: Prospects for Europe

Executive Summary

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## Background and Research Objectives

For the 50<sup>th</sup> anniversary of the launch of Sputnik-1, in 2007, the rebirth of Russian space activities appeared well on its way. After the decade-long crisis of the 1990s, the country's political leadership guided by President Putin gave new impetus to the development of national space activities and put the sector back among the top priorities of Moscow's domestic and foreign policy agenda. Supported by the progressive recovery of Russia's economy, renewed political stability, and an improving external environment, Russia re-asserted strong ambitions and the resolve to regain its original position on the international scene. Towards this, several major space programmes were adopted, including the Federal Space Programme 2006-2015, the Federal Target Programme on the development of Russian cosmodromes, and the Federal Target Programme on the redeployment of GLONASS. This renewed commitment to the development of space activities was duly reflected in a sharp increase in the country's launch rate and space budget throughout the decade. Thanks to the funds made available by flourishing energy exports, Russia's space expenditure continued to grow even in the midst of the global financial crisis. Besides new programmes and increased funding, the spectrum of activities was also widened to encompass a new focus on space applications and commercial products. Moreover, in order to increase competitiveness and the valorisation of the benefits derived from the country's capacities and expertise, the space industry underwent an ambitious restructuring, which combined stronger state involvement with the desire to create national champions in each major branch (propulsion, launchers, space systems, etc.).

Whereas the ambitious goals setting forth the future development of the Russian space programme were supported at the highest political level, ten years later, much of this prospective resurgence seems to have failed the reality check, with a number of endogenous and exogenous developments triggering significant changes in Russia's space posture. Russia's posture in space has had to be once again adapted to cope with new realities, causing major reconsiderations on both the domestic and international fronts.

These changes are well reflected in the adjustment of Russia's space policies and programmatic goals, in the further restructuring of its domestic space industry, and in its changing attitude towards international space partnerships. One of the most striking features is that Russia, which had increasingly opened its space programme to Europe and the United States after the end of the Cold War, has, in the past few years, shown greater resolve to achieve autonomy from foreign sources, while enlarging its international outreach to new emerging space nations and groupings.

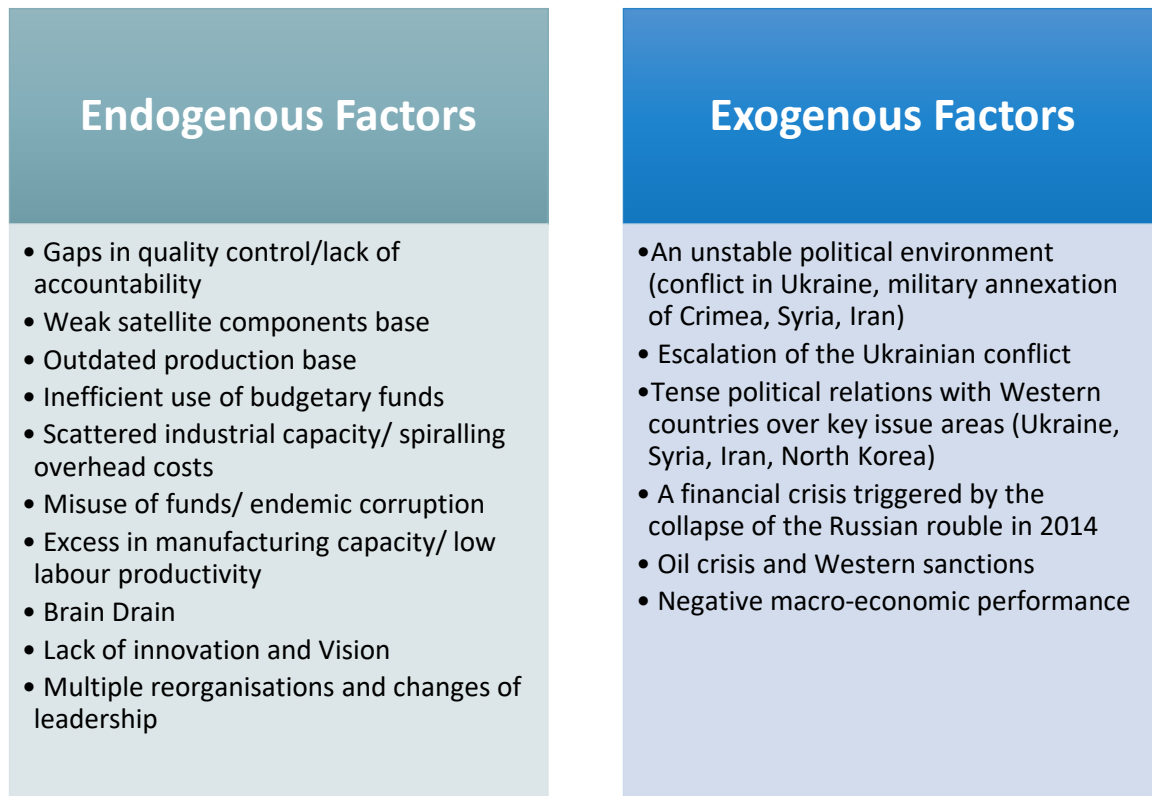
These evolutions and changing attitudes have the potential to strongly impact current and upcoming relations with foreign partners, including Europe, which has traditionally considered Russia as one of its two main strategic partners in its space endeavour. Whereas long-standing cooperation had hitherto developed between Russian and European partners in various areas, from science to launchers to human spaceflight, the ongoing redefinition of priorities and directions raises a number of open questions for Europe.

This study aims to shed light on the recent development of Russian space activities, focusing on both their current status and future outlook. The analysis looks at the evolution of the domestic and international dynamics that have been impacting Russia's direction in space, with the goal of providing an assessment on their impact for current and foreseeable Europe-Russia space relations. More specifically, the study responds to a threefold objective:

- Provide a comprehensive assessment of the most recent evolution of Russian space activities
- Investigate the development and current state of affairs of Russia's international posture in the space arena, with a focus on its attitude towards international cooperation with key partners.
- Evaluate the potential impact of changes on Europe-Russia space relations, outline possible developments and identify options for cooperation.

## Domestic Developments in Russia's Space Programme

After promoting the ambition of a second golden age for its space activities, the Russian space sector seems to have once again tottered over the past 10 years on the precipice of a systemic state of crisis. Despite the positive rhetoric from the government, this situation was the inevitable by-product of the persistence of many structural problems that the Russian space sector proved unable to tackle during the expansion phase of the 2000s, combined with a series of negative external factors outside the direct control of Russia's space authorities and related to a deterioration in Russia's broader political and economic environment. The most prominent issues that have been identified through a review of publicly available documents and interviews with stakeholders are summarised in Figure 1.



*Figure 1: Endogenous and Exogenous Causes of Russia's space crisis*

The combination of these factors has caused a number of important consequences for the Russian space programme, the most prominent of which are:

- the unceasing sequence of launch and spacecraft failures that occurred between 2010 and 2017,
- the delay – and in some cases the cancellation – of several programmes (e.g. the MLM, UM and NEM modules for the ISS, Venera-D, Venera-Glob, and Phobos-Grunt, etc.),
- the substantial reduction in both short and long term budget planning and disbursement,
- the strains on the country's commercial operations and cooperative undertakings.

Beyond the immediate impacts, the combination of these endogenous and exogenous factors has generated broader impacts on Russia's institutional space environment, in its policy orientations, and in its programmes and technological development. More specifically:

- At software level, there has been a fundamental re-orientation of Russia's space priorities towards more programmatic endeavours as a way to cope with the new budgetary realities;
- At orgware level, there has been an acceleration and change of direction in the institutional and industrial overhaul initiated in the mid-2000s.

While changes in the organisation of Russian space activities have been almost constant over the past 25 years (see Figure 2), the report shows that the 2016 reforms mark a radical departure from the current trends in the space sector.

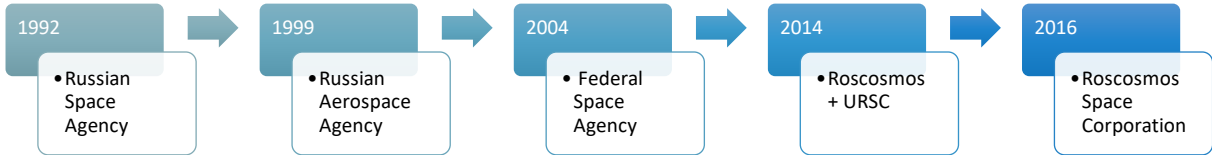


Figure 2: The Evolution of Russia’s Space Agency

By restructuring Roscosmos space agency into a State Corporation to combine all the possible functions under one roof, Russia has consciously chosen not to follow the worldwide trends of strengthening the involvement of private players in the space sector, but rather to rely on a centralised public space sector and focus on fostering its competitiveness in international markets, building on the successful model of the Rosatom State Corporation.

This reform process, completed in 2017, is certainly an indicator of the attention that the Russian government continues to give to national space activities, which are still considered a strategic asset for supporting the realisation of national objectives. However, the consequences of this strategic choice are still difficult to foresee. In fact, the assessment performed in this study pinpoints Janus-faced implications, as summarised in Figure 3.

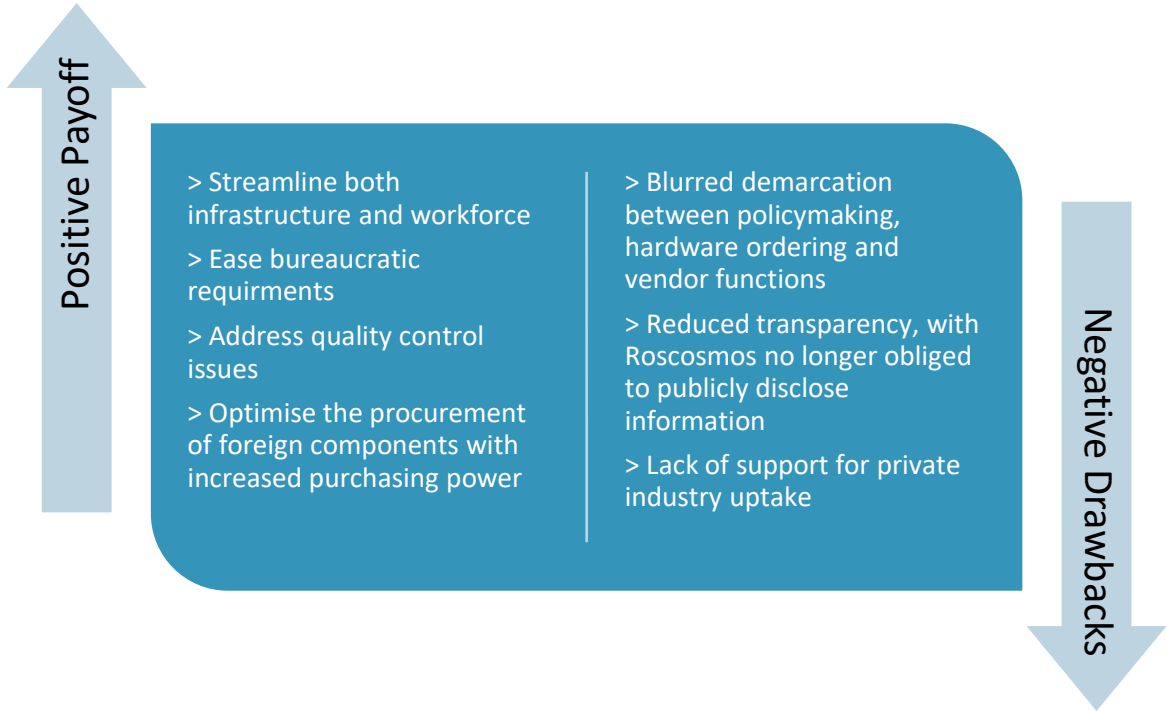


Figure 3: Payoffs and Drawbacks of Russia’s Institutional Overhaul

Irrespective of the eventual consequences, it is clear that a situation comparable to that existing before the entire reform process was started, i.e. similar to the structures during the Soviet era, may be now rehabilitated. Moreover, even though the lack of privatisation and support for private industry (with the partial exception of the Skolkovo space cluster) do not automatically preclude Russia’s successful

integration in global space markets, the current setting does not seem particularly encouraging either. This is notably so in the global market for downstream service applications, where Russia's sales are in a tiny pocket, but the situation is not stable even when it comes to traditionally successful areas such as commercial launch services, with Russia's market share inexorably declining. More broadly, the lack of private players' involvement in the Russian space sector may reduce prospects for technological innovation and the socio-economic impact of space-related investments, eventually causing overall stagnation of the Russian space programme.

As in the past, Russia will certainly continue to defy prediction about the eventual collapse of its space programme, but it appears now more than ever that in order to ensure the long term sustainability of its space sector, Russia will need to devise a new strategy and further open its space programme to international cooperation and competition.

## Russia's International Space Posture

The recent evolution of the Russian space sector and the recent strains in Russia's economic performance and international relations have led to changes in its cooperation with foreign partners. The analysis performed within this study has revealed a dichotomous evolution of its cooperation with foreign partners:

- On the one hand, there has been a visible reduction of cooperation efforts with several former partners (most visibly, Ukraine, Kazakhstan and the U.S.) accompanied by a push towards greater autonomy from foreign sources. This tendency intensified following the 2014 Crimea crisis, a year that marked the end of many cooperative undertakings. More specifically, Russian space authorities have:
  - repatriated the share of multinational joint ventures (ILS, Sea Launch, ISC, SIS) to Russia,
  - put a stop to future use of vehicles not entirely manufactured domestically, such as Dnepr and Zenit (also in light of the export ban on the Ukrainian side)
  - accelerated the construction of the Vostochny launch site to replace dependence on Baikonur
  - started to develop production capabilities for critical components that have not yet been domestically available.
- On the other hand, there has been a broadening of cooperation with new actors, particularly emerging spacefaring nations such as Brazil, South Korea and Indonesia, and non-Western countries such as China, India and Iran, in the form of both technology transfer and joint activities. Whilst such diversification in Russia's partnership portfolio was already unfolding in the mid-2000s, it has further intensified in recent years, in the context of Russia's worsening economic performance and diplomatic relations with the West. This partnership diversification has been driven by different factors, namely by:
  - Russia's resolve to compensate the increasing strains on cooperation with the West, and to mitigate the risks of isolation in its international space outreach. For instance, Russia quickly turned to China as a back-up partner in the area, for provision of electronic components for example.
  - The need to fill gaps by using those avenues of cooperation not closed by the West, hence also strengthening political ties with non-Western powers and groupings (e.g. the BRICS).
  - The increasing need to find alternative sources of revenue because of budget reductions in recent years. Emerging space faring nations such as Brazil, Iran and Korea want to develop their space activities quickly and need cooperation to acquire technologies and expertise. However, cooperation between Russia and these countries is still seen as potentially sensitive in some cases, both domestically and internationally, and issues of technological transfer tend to hinder it.

As emerges from the analysis, such diversification in Russia’s partnership portfolio may cause important transformations in international space alignments, but these should not be overstated either. Russia’s past and current cooperation experience with countries such as India, China and Brazil shows that the development of new relations faces inherent hurdles, including a mismatch in interests, priorities and capabilities, as well as a diffuse level of political mistrust. As the failed cooperation initiatives with India in the fields of launchers, space exploration and human spaceflight clearly show, not all desirable partnerships might actually materialise, and in some instances Russia’s position within the international (space) arena may even border on isolation.

Still, some of the most recent developments in Russia’s external relations (such as for instance the envisaged participation in the framework of NASA’s Lunar Orbital Platform-Gateway LOP-G and the recently established cooperation with ESA for lunar exploration) clearly show that Western countries remain preferred – not to say obliged – partners for Russia in its space endeavours. Russia’s industry and research institutes are indeed interested in working more closely with their American and European counterparts (not least because Russia needs their quality management expertise). The Europeans in particular are perceived as important and reliable partners, with a diversified and attractive offer for Russia, especially since long-standing cooperation has accrued tangible benefits for both sides.

### Prospects for Europe

In the final part, this study performed an assessment of past cooperation between Russian and Europe; disentangled the impact that the recent evolutions of the Russian space programme, industry and international posture may have on Europe’s need/will to cooperate with Russian partners; and presented foreseeable developments in key issue areas, as well as a set of possible options for Europe.

The assessment of Europe’s past experience in its cooperation with Russia revealed that it has accrued a number of benefits for the two partners, though barriers should not be underestimated (Figure 4)

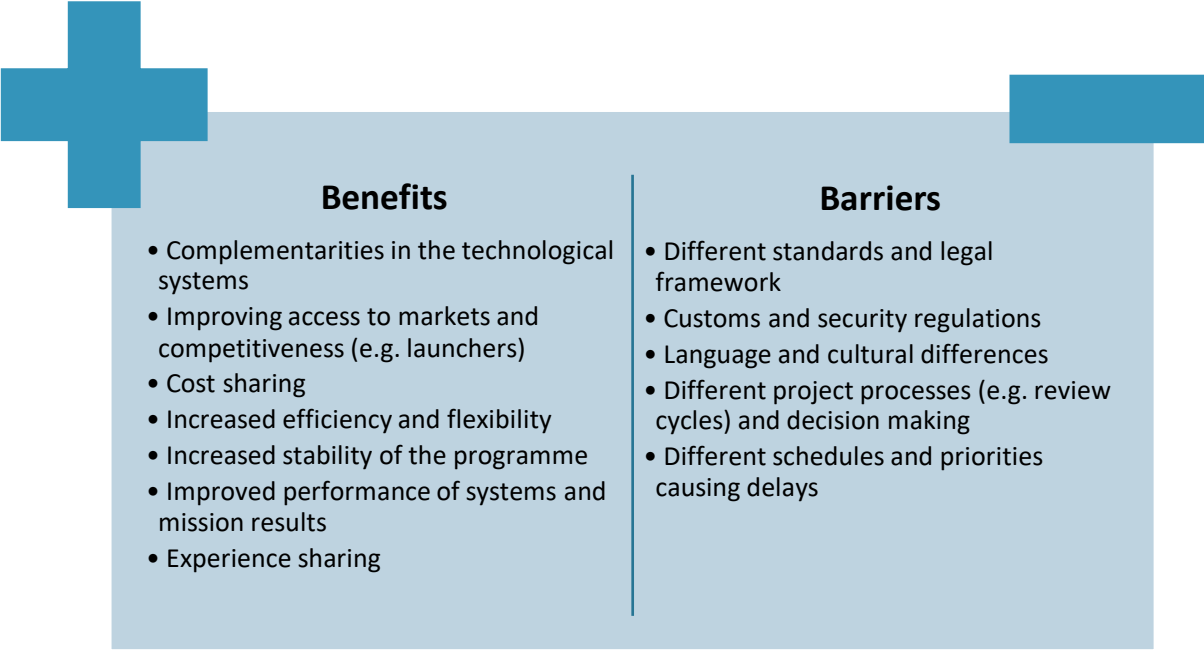


Figure 4: Benefits and Barriers in Europe-Russia Space Cooperation

The domestic evolution of the Russian space programme, together with the new developments in its external posture, has the potential to negatively impact European-Russian relations and space cooperation:

#### **Institutional Consolidation:**

- May require some amendments to the cooperation agreements and cause some delays, but also potentially streamline the execution of cooperative agreements

#### **Budget Cuts:**

- Potentially endanger ongoing cooperative activities
- Require future cooperation areas to be chosen wisely to avoid delays or even cancellations

#### **Quality/Reliability Issues**

- Contribute to making Russia less attractive for cooperative undertakings
- Higher insurance prices for Russian launch services

#### **Policy Re-Orientation**

- Different schedules and priorities
- Decreases the scope of potential undertakings to be pursued through cooperation

#### **Russia's More Assertive Foreign Policy**

- Contributes to an environment that is not very favourable for developing cooperation in space
- Puts into question Europe's reliance on the Russian partner in key domains such as access to space.

#### **Sanctions on Russia**

- Make daily cooperation activities more cumbersome and cause delays (e.g. sanctions on electronic components requiring a waiver for the ExoMars programme).
- Push Russia to seek other partners

#### **Russia's Partnership Diversification**

- Possibly reduces cooperation opportunities between ESA and these countries
- Price typically too high for this class of customer

*Figure 5: Impact of Russia's Evolution on Cooperation with Europe*

Whereas for existing cooperation projects key European stakeholders such as ESA and EUMETSAT have been opting for a “business as usual” approach by keeping politics out of their activities (also thanks to the programmatically-driven nature of the two organisations), it is undeniable that there have been fewer drivers for an expansion of space cooperation with Russia. Quite to the contrary, the strains in the political sphere – coupled with the loss of confidence in Russian space systems – seem to have made Europeans more hesitant in relying on the Russian partner in key domains such as access to space. This is for instance reflected in the decisions endorsed at the 2014 ESA Ministerial Council concerning the development of Ariane 6 and the discontinuation of Soyuz from Kourou.

More broadly, despite Europe and Russia remaining today interdependent in their space endeavours, and ESA continuing to explore numerous opportunities of mutually beneficial cooperation with Russia, as, inter alia, demonstrated by the new Cooperation Agreement of 2017, the analysis indicates that the impact of the degraded political context should not be underestimated and that for now the Europe pathway will be one of selective engagement rather than the fully-fledge partnership or even joint strategy envisaged in the 2000s. This becomes evident when analysing the major areas of current and potential cooperation between Europe and Russia: access to space, space sciences and exploration, human spaceflight and satellite applications, where a purely programmatically driven approach is emerging.

Whereas Europe-Russia ties are now set to decline in one of their most symbolic fields of cooperation, namely launchers and launch services, they are now expanding in the area of space exploration with a number of ambitious projects throughout the next decade (See Table 1), and, thanks to the re-orientation of Russia's space policy, possibly also in the area of space applications for scientific and commercial purposes.

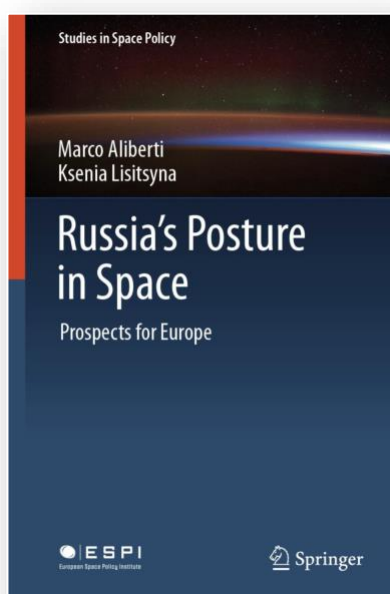
Date	Project name	Notes
2018	BepiColombo	Mercury comprehensive study
2019	Luna-Globe (Luna-25)	Simple lunar lander
	ISS Multi-Purpose Laboratory (MLM)	European Robotic Arm on the MLM
2020	ExoMars	Rover and surface science platform
2021	Luna-Resurs-1 (Luna-26)	Lunar Orbiter
2022	Luna-Resurs-PA (Luna-27)	Advanced lunar lander
2024	Phobos-Grunt-2	Phobos sample return mission
2025	Bion-M3	Biological-research satellite
2025+	Luna-Grunt	Lunar soil return mission

*Table 1: Europe-Russia Future Cooperation*

As evident from Table 1, for the time being, the main focus of Europe’s cooperation with Russia will continue to be the implementation of the many cooperative undertakings already underway in the areas of space sciences, human spaceflight and space exploration (Bepi Colombo, ISS-related activities, the ExoMars programme, etc.). A noteworthy development, however, is offered by the cooperative activities concerning the Roscosmos-led Luna programme (Luna-Glob, Luna-Resurs Orbiter, Luna-Resurs Lander, and Luna-Grunt sample return mission).

The Moon is ESA’s top priority destination for robotic exploration as well as the next likely destination for human exploration following the decommissioning of the ISS. By pursuing this cooperation with Roscosmos, Europe (but also Russia) will ensure the development of key technologies for the pursuit of more ambitious exploration missions; technologies that in turn will contribute to making ESA a so-called partner of choice in the international exploration architecture of the post-ISS context. Clearly, while cooperation in the field of space exploration is mainly intended to fulfil programmatic needs rather than political purposes, it should nonetheless continue to be backed at the political level.

Providing that there is sufficient backing on both sides, this blossoming area of cooperation between ESA and Roscosmos may well replace the declining cooperation on access to space as a new symbolic – and strategic – pillar of cooperation, underpinning Europe’s historical capacity to use space as a tool for bridge- and coalition-building, and possibly even paving the way for more ground breaking cooperation in the post-ISS human exploration context.



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