

## Launcher policy in Europe: from symbol to the market?

**Christophe Venet**

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Launchers constitute one of the most tangible elements of a nation's space activities. This is particularly the case in Europe, where Ariane 5 is a strong symbol of pan-European identification. For more than thirty years, the successes of the Ariane launcher family epitomised European achievements in space. At the same time, they are the result of technological and scientific integration processes at the European level.

Launchers are strategic enablers: more than a goal in itself, the establishment of launch capabilities is the indispensable precondition for any comprehensive space policy. Thus, access to space has a dual dimension: it is a strategic necessity, as it enables independent decision-making based on space data, but it is also a service of general interest, as it allows the deployment of space applications providing wide socio-economic benefits.<sup>i</sup>

Launcher policies mirror all the major features of the European Space Policy (ESP), as they deal with political, industrial, strategic, symbolic, governance and economic issues. In addition, the launch sector is closely associated with the concept of autonomy, often presented as the main driver behind the ESP. Two conflicting positions lie at the heart of the debate. The political standpoint argues that an autonomous access to space is a strategic necessity for Europe, and that this political objective should dominate any other consideration. A second perspective rather focuses on the economics of the launch sector, putting emphasis on cost-effectiveness and on commercial logics.<sup>ii</sup> The major challenge for Europe is to reconcile these two positions into a coherent launcher policy.

Most of the paradoxes of Europe's launcher policy stem from these seemingly contradictory positions. Arianespace is the leader on the commercial launch market for several years now, but it recently faced financial difficulties. Similarly, Europe is the only major spacefaring entity without a development programme for a next generation launcher as of yet. Finally, it is the only space power without a clear preference policy ordering to launch institutional payloads aboard European rockets.

In the wake of the ESA Council at Ministerial Level, which will take place in Italy next fall, launchers came back on the top of the European space policy agenda. It will be one of the major issues discussed at the Council, and the outcome of the negotiations will have an enduring effect on the future of the ESP. Indeed, Europe's position on launchers seems to be increasingly fragile. Confronted with a growing global competition in a rapidly evolving commercial market, Europe's political support is gradually fading away in a context of financial and economic crisis.

Launcher policy will be one of the major issues discussed at the upcoming ESA Council at Ministerial Level. Europe is at the crossroads, as it needs to find the adequate balance between political necessities (ensuring an autonomous access to space) and economic realities (reducing costs).

Christophe Venet is Research Associate to the Ifri Space Policy Program.

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The European launcher strategy is burdened by structural political constraints. Due to a complex interplay between a rising EU and competing national interests, there is no consensus on a European definition of autonomous access to space (1). In addition, current discussions and future decisions on the issue are overshadowed by the crisis. This led to a real paradigm shift in the definition of the future launcher: the focus is now put on the demand, rather than on the supply side (2). Finally, first elements of a future European launcher policy will be sketched (Conclusion).

## Political constraints

Launchers might well be one of the most politicised issues within the ESP. It is linked to the strategic debate around autonomous access to space, but it also reflects the growing importance of the EU in the ESP, as well as the balance between the major spacefaring nations in Europe.

### *How to define autonomous access to space?*

Getting an autonomous access to space through an indigenously developed launch vehicle has always been an early objective for any nation with space ambitions. In the case of Europe, the development of a policy of autonomous access to space was even more dramatic, as it was triggered by the famous conflict with the U.S. over the launch of the French-German *Symphonie* satellites.<sup>iii</sup> The maiden flight of Ariane in December 1979 can thus be considered as the first milestone of a truly independent European space policy.

Since then, the necessity of an autonomous access to space is systematically highlighted in official documents. The EC/ESA Framework Agreement of 2003 clearly identified “Europe’s independent and cost-effective access to space” as a strategic necessity.<sup>iv</sup> This stance was confirmed by the EC Communication and the Council Resolution laying down the ESP.<sup>v</sup> The 2005 ESA Council “Resolution on the evolution of the European launcher sector”,<sup>vi</sup> the 5<sup>th</sup> Space Council Resolution<sup>vii</sup>, the 7<sup>th</sup> Space Council Resolution<sup>viii</sup> or the EC Communication on a space strategy<sup>ix</sup> reiterated this political commitment.

Despite this wide political consensus on the principle of an autonomous access to space, the concrete implementation of the concept is difficult in the European context. Three major issues illustrate this. First, ESA Member States have always been reluctant to support the launch sector financially. The European Guaranteed Access to Space (EGAS) Programme covered the fixed costs of operating Ariane 5 and provided around 250 million Euros a year to Arianespace between 2004 and 2010.<sup>x</sup> After the end of the programme however, Member States accepted to renew their financial support only after an in-depth audit of the European launch sector.

Second, Europe has no constraining policy of “European preference” for institutional launches. ESA is the only institutional actor which defined an unambiguous launch service procurement policy in its 2005 Council Resolution.<sup>xi</sup> It stated that for ESA missions, preference shall be given first to launchers developed by ESA (Ariane 5 and Vega), then to Soyuz, and only then to other launchers. The Resolution also calls ESA Member States to consider European launchers when defining and executing their national programmes, but several of them, such as Germany or Italy, recently chose foreign launch systems to orbit their military satellites.<sup>xii</sup> This situation is in sharp contrast with the strong institutional support to the launch sector in all the other spacefaring nations.<sup>xiii</sup>

Finally, Europe is the only major spacefaring entity which is not actively developing a next generation launcher.<sup>xiv</sup> ESA launched its Future Launcher Preparatory Programme (FLPP) in 2004 to prepare for the next generation launcher.<sup>xv</sup> In addition, the Ariane 5 post-ECA programme has been adopted at the 2008 ESA Council at Ministerial level. 357 million Euros were allocated in this framework for a three-year pre-development phase. Despite these early steps however, discussions on the future European launcher did not progress substantially. A formal decision is to be taken at the upcoming ESA Council at Ministerial Level, focusing on the future of the Ariane 5ME and Next Generation Launcher (NGL) programmes. Given the current political and economic difficulties however, the future European launcher policy is more than uncertain.

### *The growing role of the EU*

The European launch sector is affected by the growing role played by the EU within the ESP. Thanks to the Galileo and GMES programmes, the EU became not only the biggest institutional customer in Europe, but also Arianespace's most important customer overall. While Soyuz (launched from Kourou) and Ariane 5 will launch all the satellites of the Galileo constellation, Vega landed its first commercial contracts in late 2011 to launch the Sentinel 2 and 3 satellites.<sup>xvi</sup>

This evolution might have several consequences. First, it could affect Europe's stance on the issue of European preference for institutional launches. For Galileo, the EU insisted that the satellites should be launched from European territory, given their sensitive and strategic nature. However, this does not mean necessarily that the launch vehicles used are fully European (Soyuz is a Russian vehicle operated from Kourou, and Vega has a Ukrainian upper stage). In addition, the EU usually insists on dual sourcing when passing its contracts, which could be potentially detrimental to the European launch industry (in the case of Galileo though, it meant that both Ariane 5 and Soyuz should be used for the launches). Finally, the limited financial resources allocated to both flagship programmes could also be problematic for the European launch sector, as the cost factor might outweigh the "buy European" factor.

The increasing role of the EU could also have consequences on the funding of the Guyana Space Center (GSC). Currently, its operating costs are split between France (1/3) and ESA Member States (2/3). While France guarantees an access to the GSC<sup>xvii</sup>, ESA Member States committed themselves to support the GSC financially for the period 2009-2020 through an intergovernmental agreement which entered into force in November 2009.<sup>xviii</sup> Several voices already called for an increased "europeanisation" of the GSC: ESA Member States in a 2008 Council Resolution<sup>xix</sup> and former French President Sarkozy in February 2008.<sup>xx</sup> A more active involvement of the EU in the GSC seems unavoidable due to its increasing political weight in the ESP. However, governance issues and EU-specific financial constraints will make it difficult.<sup>xxi</sup>

Finally, the role of the EU in the launch sector indirectly raises the question of industrial procurement rules. The principle of geographical return has always been at the heart of the European launch sector. While this enables a specialisation process, and is thus a quality assurance, it also results in a scattered industrial landscape, both for development and production activities.<sup>xxii</sup> Given the constrained financial environment, several voices are calling for a focus on pure cost factors rather than on geographic return for the development of the next European launch vehicle.<sup>xxiii</sup> This in turn, could unleash new political conflicts between certain ESA Member States.

### *The evolving geopolitics of the launch sector*

Member States remain the central actors in the European launch sector. The industrial base is very concentrated, as France, Germany and Italy are the clear leaders in launcher technologies. As a consequence, the discrepancy between major actors and smaller countries – a classical feature of the ESP – is exacerbated in the case of launcher policy. The fate of Europe's launcher policy is in the hands of a handful of countries, which poses two essential governance problems: all the other ESA Member States feel excluded from the discussions, and the whole decision process could be blocked in case of persisting divergences between the three main players.

As a matter of fact, the interests of the three main actors may be difficult to conciliate. France has always been the major player in the European launch policy. Maintaining a robust launch sector is a strategic necessity both for political reasons (autonomy should be the main pillar of the ESP) and for military reasons (there are strong synergies between the civilian launch sector and the French ballistic missile programmes). France's strong support to the launch sector is also reinforced by industrial motivations: new launcher development programmes are crucial to keep its space workforce busy. At the same time however, France is keen on sharing the heavy financial burden with the other ESA Member States. This was testified by two recent French moves: the call for a "europeanisation" of the GSC, and the proposal to open Arianespace's shareholding structure to other ESA Member States.

Germany traditionally put less emphasis on the political necessity of an autonomous access to space. It occasionally counted on foreign commercial launch providers to orbit its institutional

satellites.<sup>xxiv</sup> In recent years however, an increasing convergence with the French position is noticeable, as testified by the recent German national space strategy. The text dubbed unhindered access to space a matter of European sovereignty.<sup>xxv</sup> Tensions with France reappeared in the last months however, as the two major players seem to disagree on the launcher strategy to adopt at the ESA Council. Germany is strongly supporting Ariane 5ME, a more powerful version of the current Ariane 5ECA, as it expects important industrial contracts from this programme. France on its side is pledging for the development of an entirely new launch vehicle. In this perspective, it already awarded 250 million Euros for preparatory work in late 2010.<sup>xxvi</sup> Despite these diverging positions, both countries remain conscious of their political responsibilities. After the 14<sup>th</sup> French-German Council of Ministers in February 2012, a common declaration on space policy was released<sup>xxvii</sup>, ordering both national space agencies to establish a working group. One of its objectives will be to elaborate a common French-German position on launchers before the ESA Council.

It would be a mistake to focus exclusively on the French-German tandem in the field of launchers though. Thanks to the successful development of Vega, Italy became a very credible actor in this field and modified the geopolitical balance. The path to get there was long and difficult, as Germany was initially very sceptical about the viability of a light launcher, and as France was actively trying to slow down the programme.<sup>xxviii</sup> The broadening of industrial and technological capabilities to Italy is certainly a positive development for the European launch sector.<sup>xxix</sup> It could open new perspectives for Europe's future launcher strategy, away from a constraining French-German duopoly. At the same time, current uncertainties over Italy's space budget could limit the country's future involvement in the launch sector.

### **Towards a paradigm shift**

In addition to structural political constraints, the future of the European launch sector is overshadowed by the current economic crisis. This led to an increased focus on the commercial environment of launch activities, and triggered a real paradigm shift. The major objective for the future European launch vehicle is not to develop pure launch capabilities (supply side), but rather to propose tailored solutions to institutional and commercial launch service customers (demand side).

#### *The adverse impact of the crisis*

Initially, the global economic crisis didn't seem to have a strong impact on the space sector. Commercial space activities continued to grow, and institutional actors labelled the space sector a strategic asset for the future.<sup>xxx</sup> In recent months however, budgetary difficulties in some major ESA Member States (such as Spain, Italy or France) played an increasing role in the debates preceding the ESA Council.

The launch sector is particularly affected by this situation. The best example of this is the evolution of French and German positions on post-Ariane 5ECA scenarios. In 2010, both countries agreed to work in parallel on Ariane 5ME and on a new follow-up launcher.<sup>xxxi</sup> In recent months however, France indicated that it had not made its decision yet (support Ariane 5ME, NGL or both), and that the tight budgetary environment will be a decisive factor guiding its choice.<sup>xxxii</sup>

The cost factor has always been very high on the Member States' agenda and the crisis even reinforced this tendency. Rocket economics became the most important element to consider for the development of the future European launcher, above technical performances and industrial concerns.<sup>xxxiii</sup> More than the production costs, operating costs will be the key variable and should be included in the equation from the beginning.<sup>xxxiv</sup>

This increased importance of the cost factor led to a refocus on the commercial aspects of launch activities.

#### *Putting satellite users and operators at the forefront*

In the case of Europe, the institutional market for launch services is too narrow to be commercially viable. The number of institutional missions that could be fulfilled using an Ariane 5 is around four a year, which represents two launches.<sup>xxxv</sup> As a consequence, a strong

presence of Arianespace on the commercial launch market is vital to maintain a certain economic balance. This equilibrium between commercial logic and institutional support is the crucial equation in the European launcher policy.

In view of the increasing commercial competition in the launch market, both for heavy and light launchers, this necessity to adapt the launch sector architecture to the commercial and institutional market became more pressing. As a matter of fact, ESA launched a survey among commercial operators and institutional users to determine their priorities as a first step towards the development of the NGL. In addition, Vega and Soyuz are expected to be price-competitive on the commercial market, and operating three vehicles from the GSC will also reduce operating costs.

These are only initial efforts however, as Europe should conceive a comprehensive commercial launch strategy. Such a strategy should first define a set of clear principles, precisising in particular the exact balance between institutional and commercial launch activities. It should then define the means to reach these objectives, meaning the kind of launchers needed. Two questions seem to be particularly pressing in this respect: the viability of the dual-launch strategy in the long run and the commercial compatibility of the three launch vehicles operated from the GSC.

### **Conclusion: towards a sustainable launcher policy**

The European launch sector depends on the balance between political necessities (ensuring an autonomous access to space) and economic realities (reducing costs). The crisis put an increased emphasis on the economic realities, which in turn lead to a paradigm shift. Future launchers should be developed to respond to satellite user needs, and not according to industrial, technological or performance constraints. It is impossible to ignore these current budgetary constraints, but it would also be a mistake to forget that the autonomous access to space has a cost.

A balanced launcher policy should thus comprise five major points:

- **An unambiguous support by institutional actors.** This support has to be a political one, shared by all ESA Member States, but also a financial one, given the specificities of rocket economics.
- **An industrial reorganisation of the launch sector.** Two priorities should be concerned: the rationalisation of the industrial processes, in order to cut costs, and an improvement of the launch sector governance, in order to increase transparency, accountability and the inclusion of all Member States.
- **A sustainable commercial strategy.** Given the structural challenges of the launch market (small size, cyclicity of the demand) and the increasing competition from new entrants, Europe should tailor its commercial strategy. It should seek to remain competitive on the launch market, while at the same time reducing the exposure to commercial risk in the future.
- **A versatile launcher family.** In order to cope with the commercial challenges, it is important to have the broadest launch offer possible. The exploitation of three different launchers from the GSC goes in this direction.
- **Towards a new launcher.** It is crucial for the sustainability of Europe's autonomous access to space to keep a steady R&D activity – in form of the Ariane 5ME evolution, or of a completely new launcher.

<sup>i</sup> Bigot, Bernard; d'Escatha, Yannick; Collet-Billon, Laurent. L'Enjeu d'une Politique Européenne de Lanceurs: Assurer Durablement à l'Europe un Accès Autonome à l'Espace. 18 May 2009.

<sup>ii</sup> It must be noted however that these two positions are constructed models, and almost never exist in their "pure" form. They should rather be seen as the two poles of a policy continuum.

<sup>iii</sup> Sheehan, Michael. The International Politics of Space. London/New York: Routledge, 2007: 78ff.

<sup>iv</sup> Council of the European Union. Council Decision on the Signing of the Framework Agreement Between the European Community and the European Space Agency. Doc. 12858/03 of 7 October 2003.

<sup>v</sup> Commission of the European Communities. Communication from the Commission to the Council and the European Parliament. European Space Policy. COM(2007)212 final of 26 April 2007.; Council of the



- European Union. Resolution on the European Space Policy. Doc. 10037/07 of 25 May 2007.
- <sup>vi</sup> European Space Agency. Resolution on the Evolution of the European Launcher Sector. Doc. ESA/C-M/CLXXXV/Res.3 (final) of 6 December 2005.
- <sup>vii</sup> Council of the European Union. "Council Resolution. Taking Forward the European Space Policy." Doc. 13569/08 of 29 September 2008.
- <sup>viii</sup> Council of the European Union. 7<sup>th</sup> Space Council Resolution. Global Challenges: Taking Full Benefits of European Space Systems. 25 November 2010.
- <sup>ix</sup> Commission of the European Communities. Communication from the Commission to the Council and the European Parliament. Towards a Space Strategy for the European Union that Benefits its Citizens. COM(2011)152.
- <sup>x</sup> Ruello, Alain. « Arianespace: les Etats européens veulent trancher en mars la question de l'actionnariat. » Les Echos, 5 January 2011.
- <sup>xi</sup> European Space Agency. Resolution on the Evolution of the European Launcher Sector. Doc. ESA/C-M/CLXXXV/Res.3 (final) of 6 December 2005, p. 12-13.
- <sup>xii</sup> The German SAR-Lupe satellites were launched aboard a Russian Kosmos rocket, the Italian Cosmo-Skymed satellites aboard a U.S. Delta II rocket and the Italian Sicral 1B aboard a Russian-Ukrainian Zenit launcher.
- <sup>xiii</sup> Centre d'analyse stratégique. « Une ambition spatiale pour l'Europe », 2011, p. 52.
- <sup>xiv</sup> The heavy launchers currently in development are Angara for Russia, Long March 5 for China, GSLV Mk. III for India, Falcon 9 and Falcon Heavy for the US. In addition to these, lighter launch vehicles are also being developed: Epsilon in Japan, VLS in Brazil, Naro in South Korea, Tsiklon 4 in Ukraine.
- <sup>xv</sup> Ackermann, Jürgen ; Breteau, Jérôme; Kauffmann, Jens; Ramusat, Guy and Giorgio Tumino. «The Road to the Next-Generation European Launcher. An overview of the FLPP. » ESA Bulletin 123, August 2005.
- <sup>xvi</sup> de Selding, Peter. « Two Sentinel Satellites to Launch Atop Vega Rockets. », Space News, 14 December 2011.
- <sup>xvii</sup> Loi N. 2006-615 du 29 Mai 2006 autorisant l'approbation de l'accord entre le Gouvernement de la République Française et l'Agence spatiale européenne relatif au Centre spatial guyanais. JORF n. 124 du 30 mai 2006 page 8020, texte n. 5.
- <sup>xviii</sup> Declaration by Certain European Governments on the Launchers Exploitation Phase of Ariane, Vega and Soyuz from the Guiana Space Center. Paris, 30 March 2007.
- <sup>xix</sup> European Space Agency. Resolution on the CSG (2009-2013). ESA/C-M/CCVI/Res.3 (Final). Adopted on 25 November 2008.
- <sup>xx</sup> AFP. « Sarkozy plaide à Kourou pour une politique spatiale cohérente et raisonnée ». 11 February 2008.
- <sup>xxi</sup> Bigot et. al. op. cit., p. 25.
- <sup>xxii</sup> Bigot et. al. op. cit., p. 14.
- <sup>xxiii</sup> de Selding, Peter. « Affordability, Not Geographic Return, Key Criteria for Europe's Next Rocket. », Space News, 4 May 2012.
- <sup>xxiv</sup> This tendency might also be reinforced by the existence of Eurockot GmbH, a German-Russian joint venture selling Rockot launches on the commercial market.
- <sup>xxv</sup> Bundesministerium für Wirtschaft und Technologie. Für eine zukunftsfähige deutsche Raumfahrt. Die Raumfahrtstrategie der Bundesregierung. Berlin: Bundesministerium für Wirtschaft und Technologie, November 2010.
- <sup>xxvi</sup> Space Daily. « France's Industrial Policy And Future Of The Space Sector. », 20 December 2010.
- <sup>xxvii</sup> Présidence de la République. Déclaration du ministre français de l'Enseignement supérieur et de la Recherche et du ministre allemand de l'Economie et de la Technologie sur la politique spatiale. 14<sup>ème</sup> Conseil des Ministres franco-allemands, 6 February 2012.
- <sup>xxviii</sup> On Franco-Italian tensions over Vega, see Marta, Lucia. « Perceptions italiennes sur la coopération spatiale militaire avec la France. » FRS, Note n° 16/11, Spring 2011.
- <sup>xxix</sup> Marta, Lucia. « L'avenir de Vega : quel marché et quels défis pour le nouveau lanceur européen ? » FRS, Note n° 03/12, 12 March 2012, p. 9.
- <sup>xxx</sup> See, Venet, Christophe. « Space in the financial and economic crisis. », in: Schrogl, K-U et. al. Yearbook on Space Policy 2009/2010: Space for Society. Vienna: Springer, 2011, p. 184-198.
- <sup>xxxi</sup> 12<sup>ème</sup> Conseil des Ministres franco-allemands. Croissance, Innovation, Recherche et Enseignement Supérieur. <[http://www.france-allemande.fr/Croissance-innovation-recherche\\_5234.html](http://www.france-allemande.fr/Croissance-innovation-recherche_5234.html)>, 4 February 2010.; de Selding, Peter. « Germany Reaffirms Commitment to \$2B Ariane 5 Upgrade. », Space News, 28 October 2011.
- <sup>xxxii</sup> de Selding, Peter. « France Undecided on Ariane 5 Investment Question. », Space News, 8 December 2011.
- <sup>xxxiii</sup> de Selding, Peter. « Next Generation Ariane Tops Agenda for ESA Ministerial. », Space News, 25 May 2012.
- <sup>xxxiv</sup> de Selding, Peter. « Europe's Launch Infrastructure Costs Loom Large Amid Fiscal Crisis. », Space News, 28 May 2010.
- <sup>xxxv</sup> Bigot et. al. op. cit., p. 5.