FORESIGHT IN EUROPEAN SPACE AND GEOSPATIAL POLICIES: REPERCUSSIONS FOR THE GEOPOLITICAL SECURITY OF EUROPE

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Abstract

The decision of the European Space Agency to create its own Global Navigational Satellite System, the recent advances in space made by other space powers, notably the U.S.A., China and Russia, all prompt for a re-evaluation of Organisation for Economic Cooperation and Development's geopolitical scenarios for the Space Sector, which were drafted three years ago. The aim of this study is to provide answers to questions such as the following: What is the validity of this O.E.C.D. study today? Which ones of these scenarios and how would they change in view of the post- 2005 geopolitical changes in Europe and Asia? How and in what ways do these changes affect the Geopolitics of the European Union countries? Should the European Agencies set geostrategic goals? How should the E.U. (the ESA in particular) best respond to the growing geopolitical challenges? The method followed to provide answers to these questions is a critical re-evaluation of the OECD's geopolitical scenarios for the space Sector, by taking into account publications of the relevant space Agencies, along with assessments of possible impacts of Space Policies on certain geopolitical parameters affecting the civil and military security of the European countries. Among the results of this study are: a) A re-consideration of the OECD scenarios, b) The identification of four key areas of intervention for the European Space Policy to draft recommendations for the relevant European Agencies, in Technical-Institutional, Informational-Managerial, Institutional-Geopolitical, Geostrategic-Geopolitical fields and c) The creation of three scenarios for possible future developments of the European Space Policy. Following scenario A, named «Geo-Spatial Superpower», the European Space Policy attains global dominance in civilian space technologies. In scenario B, named «Geo-Political Custodian», the European Space Policies follow well behind the other major players, with unavoidable geostrategic downgrading of Europe. In scenario C, termed the «Geo-Strategic Pivot», the European Space Polices shift from civilian to military space technologies. It is concluded that scenario A at present appears more probable, although temporary shifts from one scenario to another may occasionally occur.

Key words: Space Policies, Geopolitics, Europe, Foresight

1. Introduction

Although it does not exist as an autonomous directory for policy-making, the European Space Policy (ESP) is mainly implemented by the European Space Agency (E.S.A.). Collateral to the work of the E.S.A., appear various ESP-related consortia, systems and societies, such as the Space Applications Institute at Ispra, the European Space Technology Master Plan and the European Cooperation for Space Standardisation (E.C.S.S.). Aside of these, the national Space Agencies of E.U. countries play rather minor roles compared to E.S.A., with the exception of the French C.N.E.S. (Centre National d' Etudes Spatiales).

These institutions however, albeit powerful, are now at the crossroads of either becoming even more influential, or gradually face unavoidable reductions in their importance, in view of the re-emergence of Russia, the rise of China and the growing turnover of the Japanese and Indian Space Agencies. The launching of the European

G.N.S.S. Galileo has been received with much hope as a basic constituent of the ESP, despite the fact that frictions with the agencies interested in continuing the supremacy of the American GNSS were expected right from the beginning of the project.

The opportunities, threats and challenges to the ESP were scrutinized in two landmark reports (O.E.C.D., 2004 and O.E.C.D., 2005). The Organisation for Economic Cooperation and Development (O.E.C.D.) had suggested three basic scenarios for the Space Sector: «smooth sailing», «back to the future» and «stormy weather». These were complemented by another nine scenarios: three geopolitical, three socio-economic (Globalisation, Regionalisation, Crisis), along with three scenarios related to energy-and-environment: «Dynamic but careless», «Bright skies», «Clean but not sparkling». All these scenarios are related to the geopolitical security of the European space, although the O.E.C.D. report did not proceed to establishing such correlations. Further, the O.E.C.D. has not produced Space Policy scenarios specific for the E.U. countries.

Yet, the geopolitical repercussions of unsettling relationships among space agencies are obvious. Consider, for instance, the inequalities among the E.U. countries participating in the ESP. Could the fact that a single European country, France, provides more than half of the total number of employees of all E.S.A. countries in E.S.A.'s most successful missile project (Ariane 5) perplex the already tricky politics of ESPs ?

The European «Arianespace» is now a world leader in commercial satellite launching (followed by Russian agencies with significant difference). But, despite E.S.A.'s well known competition by American companies (Lockheed and Boeing notably), it is estimated that Russian companies will remain the most serious competitors of E.S.A.'s chief contractor, «EADS Astrium» (Le Figaro, 2007) in the near future. For instance, the launching of new Russian carriers, such as «Angara», is expected to reduce prices significantly.

Should the ESP stick to its «soft» approach to space technologies, which heavily relies on commercialisation of space products (Peeters,2000, Peeters,2002) and give emphasis on sound spending (Gaubert, 2002)? Or should it shift to security and defence policies as other researchers suggest (Kolvos, 2002)? Whatever the case may be, the literature (Salin, 2001) suggests, that the interplay between militarization and finance is the cornerstone of space business.

Thus, a series of questions arise: How should the ESP best respond to the oncoming challenges imposed by commercial and geostrategic competition? And what are the geopolitical repercussions of its possible responses? How could these challenges be met on the basis of O.E.C.D.'s Space Policy scenarios? What are the geostrategic challenges associated to the ESPs?

To these questions this paper aims at providing possible answers.

2. Data and Methods

The method followed to derive possible answers to such questions consists in three steps a) Making a critical re-consideration of the O.E.C.D.'s space sector and geopolitical scenarios. This task is carried out by taking into account other publications, along with assessments of possible impacts of space policies on certain geopolitical parameters affecting the civil and military security of the European countries), b) Identifying the key areas of intervention of ESP and c) Forming scenarios for future ESP.

The O.E.C.D. has created some geopolitical scenarios for the space sector (O.E.C.D.,2004, O.E.C.D.,2005), with time horizon the year 2030. Following the first scenario, titled «Beggar thy neighbour», growth for space research and space applications is inhibited by severe social and environmental stresses on countries and populations, so space research remains the benefit of a few privileged countries only, much as it is now. The

second scenario, named «Ad astra», foresees increasingly multilateral approaches to world growth, high level of technological innovation, development of alternative energy resources and the rise of India and China. The third scenario, named «Rising Eastern Star» is envisaging a strengthened China at the expense of the U.S.A., which, in turn, results in a fostering of U.S.-E.U. (and, possibly U.S.-India) alliances to counter China's influence.

An elaboration of these scenarios in view of the recent (post-2005) developments on the international geopolitical check board will shape the framework in which ESP should and might range today. Hence, recommendations will be made here on how the ESP should develop in the future. Consequently, scenarios will be drafted to show how it might develop.

3. Results

3.1. Elaboration of the O.E.C.D. scenarios for the ESP specifically for the E.U. and for the post-2005 period

As relates to the O.E.C.D. scenarios, the following observations can be made, which necessarily prompt for amendments to the basic O.E.C.D. scenarios:

- As for the United States, the establishment of the U.S.Geo-Spatial Intelligence Agency (with its very appropriate logo «We own the night») announces the implementation of remote sensing technologies hitherto unmatched by any other country or even group of countries. These developments (as well as those relating to ABL weapons) are not covered by the O.E.C.D. report. Both these observations point to the fact that the dominance of the U.S. in space affairs should by no means be underestimated in drafting recommendations and scenarios for the ESP.

- As concerns Russia, the recent (2006) successful tests of very long range missiles, reputedly capable of penetrating all known Antiballistic Missile Defences, in tandem with its enhanced space-based weapons, initiate a new era in geostrategic affairs. This is because the situation is now different than a few years ago, when the strategic space forces of that country were collapsing amid corruption and negligence as reported a few years earlier (Cimbala, 2001). This country, whose nuclear arsenal remains the world's largest (probably the best equipped also), re-emerges in world affairs with a fresh vigour since late 2005 and has been vastly under-estimated in the O.E.C.D. geopolitical scenarios.

- Although containing China's recent (in the year 2006) achievements in the space sector, reading carefully the supporting documentation to O.E.C.D.'s well-founded scenarios, it can be observed that these scenarios do not adequately consider, neither the far-reaching repercussions of U.S. military supremacy in space, nor Russia's (sooner than predicted) geostrategic advance to superpower status. It is interesting to notice however, that all three O.E.C.D. geopolitical scenarios for future Space Policies define future geostrategic balance only between the U.S.A. and China. This (outdated by now) approach diminishes the ever-increasing importance of the Europe and Russia in the Space Sectors.

The insecurity imposed by the deployment of advanced U.S. and Russian weapons systems may well end up with a new arms race, or even space race between the two countries. Concerns are legitimate, that a significant part of this race may fall upon the shoulders of governments of E.U. countries to accommodate. This has happened in the past and lasted as many as 45 years. Despite the fact that the 1967 Outer Space Treaty prohibits it, it seems sad but true that space weaponization is inevitable (Hardesty, 2002). Besides, the deployment of ASAT (Anti-Satellite) weapons (either ground-based, or space-based) presents a threat to space-based applications for civilian purposes (such as those, that the E.S.A. is pursuing) more than initially anticipated. China's recent ASAT test (in 2007) was perceived as a threat to many, as it makes a race to weaponise space more likely, despite the fact that such tests have been virtually abandoned by both Americans and

Russians at least twenty years ago (The Economist, 2007, Newsweek, 2007a). Further, given the proliferation of micro-satellites (weighting less than 100 kg), it is virtually impossible to verify the absence or presence of weapons in space (Newsweek, 2007a), until the time that they will be used.

Hence, a question rises as to how the ESP should respond to these challenges. Surely, any re-evaluation of the ESP can not only be geopolitical, but it would need to address technical, institutional, geostrategic, as well as managerial aspects of the ESP. Each one of these aspects will be examined hereafter.

3.2. Identification of Key-areas of concern or intervention for future ESPs

3.2.1. Technical - Institutional aspects

Certain steps towards increasing systems inter-operability may have a disproportionately significant impact on the overall geopolitical situation and the reverse: increased systems inter-operability may come out as a result from reduced geopolitical tensions. This is a fact that the ESP might seek to exploit in all possible manners. To date, we may notice the possibility for use of both G.P.S. and GLO.NA.S.S. in certain countries (i.e. Bulgaria) for civilian purposes, as well the availability in the market of G.N.S.S.-receivers capable of receiving both G.P.S. and GLO.NA.S.S. signals simultaneously. It can therefore be anticipated that future systems will allow triple receiving, including GALILEO. In this respect, the joint efforts of the American Institute of Aeronautics and Astronautics (A.I.A.A.) and the European Cooperation for Space Standardisation (E.C.S.S.) can be very useful. These institutions might work together with the Technical Committee TC20 of the I.S.O. (the International Standardisation Organisation) and the Consultative Committee for Space Data Systems (C.C.S.D.S.) with the aim of achieving global interoperability of space vehicles and systems.

The C.C.S.D.S. acts as the principal technical advisor for I.S.O.'s TC20 (Subcommittee 13) and its recommendations are in fact endorsed by the I.S.O. To date, more than 300 space missions have been carried out with C.C.S.D.S. protocols and the C.C.S.D.S. has succeeded in establishing a working and fully functional international forum for discussing and solving technical interoperability problems for space missions, involving more than 25 countries and in partnership with more than 100 commercial associates.

If the E.U. continues to aim at developing in non-militarised ways, the C.C.S.D.S. appears particularly suited as a field in which the ESP may pursue several of its aims peacefully and successfully. A more active participation of the ESPs in the C.C.S.D.S. process will thus further augment their leverage in international space-policy making.

3.2.2. Information-Managerial aspects

A major part of ESP should be devoted to raising public awareness and appreciation of space activities, by fostering not only the purely research-related scientific activities, but also infrastructures for the public benefit, particularly of disadvantaged social groups or regions. Consider, for instance, that the French postal services provide satellite-based communication kiosques at various villages of the country. An even more effective action in raising public support for space activities could be India's EduSat, this being the first satellite worldwide fully dedicated to delivering education.

3.2.3. Institutional-Geopolitical aspects

Institutional partnerships between the ESA and other countries may well develop into the establishment of an International Space Agency, following the model of E.S.A.. In fact, for this to become a reality, probably one of the first problems to be accommodated will be the interoperability of G.N.S.S.s. In this context, the European EGNOS should be seen as an important step in this direction, since it is intended to augment both the American G.P.S.

and the Russian GLO.NA.S.S. systems.

3.2.4. Geostrategic-Geopolitical aspects

To date, there is no foreseeable European military alliance as such, since most E.U. members are N.A.T.O. members also. Whilst third countries have already made advances in developing various ASAT (anti-satellite) weapons (the U.S. and Russia since the 1980s and China last year), the capability of the E.U. for ASAT systems remains negligible. It can be conjectured that this deficit will either force the E.U. to develop its own ASAT systems in the future (which,, at present, seems rather unlikely, at least for the E.U. as a whole), or make the E.U. countries' governments to over-invest on civilian use of satellite technologies. The latter option will result in the E.U. to emerge as the prominent commercial and non-militarised pole in the space sector. The decision to develop (or not) its own military capability in space will greatly influence E.U.'s geopolitical future.

The competition in the international space-related strategic environment becomes increasingly fierce, whereby the number of countries that aspire to increase their space-based military capabilities is on the rise. Further, the U.S.A. have laid plans to develop a fully enabled, space-based, pre-emptive strike system by 2015 and continue being the world's leading military spender. However, a report of the Joint Doctrine and Concept Centre of the British Military of Defence (J.D.C.C., 2003) shows that whilst the biggest E.U. military spender now (France) ranks only 5th worldwide, the E.U. as a whole will have become the world's second military spender by the year 2030.

3.3. Foresight and scenarios for ESP

Given the O.E.C.D.'s scenarios for Space Policies and their re-evaluation in view of the four parameters explained above, the following scenarios can be shaped for the European Space Policies and their geopolitical repercussions for the E.U. countries.

Scenario A. *"Geo-Spatial Superpower"*

Following this scenario, the ESPs give such a clear prevalence on civilian and commercial use of space technologies that the E.U. develops into what we might term as «Commercial Geo-Spatial Superpower»:

Most countries (including the U.S.A., to a certain extent), will rely on European commercial satellites for their civilian uses (telemedicine, distance learning, e-commerce, earth observation/environmental monitoring etc). This success will be based on the continuing high appreciation that the European launching systems already enjoy worldwide. Hence, even smaller and less wealthy European countries will decide to increase part of their budgets to space technology investments under European schemes, thus further reinforcing the space economy of the E.U.

The rise of Europe as a provider of peaceful space technology fits squarely with its international profile as the world's major economic powerhouse. The rise of Europe as a Geo-Spatial Superpower however, may necessitate the establishment of successful partnerships with public and private aerospace companies from other countries.

The endurance of E.U.'s status as a Geo-Spatial Superpower is conditioned on: a) the E.U. countries' ability to converge in the long run (politically, economically, socially and technologically), b) the adoption of carefully designed policies by the relevant bodies (such as the ESA) and c) the maintenance of a peaceful world at global scale.

Scenario B. "Geo-Political Custodian"

Under this scenario, the ESP participates in various international cooperation schemes in the space sector, but keeps lagging behind other major players in terms of technology, economy and geostrategic power. Should the ESP in its entirety fail to compete successfully with other countries both technologically and economically, it would have virtually no geostrategic component of its own and would only be financially viable, if it established opportunistic cooperations within consortia of companies and non-European national space agencies.

In this case, ESP would mainly focus on civilian applications and, at times, it might be difficult to discern common ends among the varying baskets of the European countries' nationalised space policies.

Such a scenario may realise as a result of E.U.'s protracted inadequacy to withstand geoeconomic and geostrategic pressures imposed by other countries (or, at some later stage, by groups of countries), resulting with Europe as a geopolitical laggard in both civil and military space technologies. In this respect, the E.U. as whole (or each one European country separately) will inevitably associate themselves with non-European space powers, of which they will become simply followers (custodians).

Scenario C. "Geo-Strategic Pivot"

Under this scenario, the E.U. countries may develop political, technological and financial mechanisms to foster a geostrategically independent space policy, under the auspices of an overall (dual purpose: civil and military) ESP.

Such a development may either result from a possible prolonged failure of the NATO to fulfil its obligations to protect its E.U. country-members against an external threat or from a failure of the global geostrategic balance. Such failures may force initially one or two European countries (subsequently followed by other countries), to take lead and shape a dynamic military-and-civil ESP. Such a re-arrangement of the global system may, for whatever reason, appear if, for instance, the U.S.A. or Russia failed to keep up their geostrategic prevalence over Europe, thus leaving free room for Europe to play a pivot role within the greatest part of the continent.

In such a case, European countries will increase dramatically their financial contributions to the space sector, whilst giving priority to military space technologies. In fact, such a development could as well end up with the reverse: enhancing the European civilian space sector rather than its military. This is because the E.U., as a whole, may seem to remain far from potent enough to compete militarily with the ever more powerful U.S.A. and an always (disproportionately to the E.U.) powerful Russia.

4. Discussion

The OECD had developed scenarios for global space policy, but not for European Space Policy (ESP). None of OECD's scenarios is fit to describe the ESP in the post-2005 geopolitical environment, which is marked (among other developments) by the steadily rise of Europe as the world's most successful economic block, the recuperation of Russia and the development of ASAT capabilities by China.

For this reason, a re-consideration was necessary, which has identified certain parameters that could be taken into account by future E.U. policies. This study suggests that the European Space Agencies cease priority for intervention in four interlinking fields of space policy-making: technical-institutional, informational-managerial, institutional-geopolitical and geostrategic-geopolitical. On the basis of these key-areas, three scenarios

are drafted, shaping possible futures for the ESP.

So far, the E.U. countries' current inadequacy to match U.S.' or Russia's supremacy in space-based and space-related military capabilities has played a decisive role in keeping ESP oriented to civilian uses only. Thus, the current circumstances seem to favour scenario A. None can guarantee however, that the same conditions will prevail as they do now, fifteen to twenty years on. Were a new arms race to begin (as several analysts fear nowadays), the ESP would be trapped in between two competing giants. In such a situation, the E.U. might opt for scenario C, which, in unfavourable to the ESP circumstances, might well degrade into what scenario B describes (which, in the long run, may eventually appear more reasonable and feasible to European governments).

If there is no arms race to be unleashed anew, but only an ever harsher economic competition, then it is possible that the ESP may fare through scenario C to scenario A or, at best, straight to scenario A. Such marked shifts from intentions to reality can not be ruled out, if we considered, for instance, that N.A.S.A.'s refusal to incorporate MIR into the International Space Station ended up later with what the magazine Newsweek named a «Mir-rival-turned-Mir-replacement» (Newsweek, 2007).

5. Conclusion

In this study, a foresight of possible futures for the European Space Policy is attempted on the basis of OECD reports, by developing three scenarios. The geopolitical aspects of these scenarios are drawn on the basis of current and forecasted geopolitical conditions. These three scenarios should be accompanied by the delineation of four key-areas of intervention for the ESP, for maximising its positive geopolitical impacts. These are drawn in the present study, and relate to technical-institutional, information-managerial, geopolitical-institutional and geostrategic-geopolitical areas of ESPs. These recommendations are intended to enforce the ESP, particularly in the event that the ESP would head to developments described in scenario A (or C) and eventually overcoming all obstacles and becoming the world's leading superpower in commercial and civilian space applications. In view of these results, it is concluded that the three scenarios presented here can be useful for deriving foresights relating to the interplay between geopolitics and the space sector in Europe.

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