

6. Trends in shaping space policies around the world

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6.1. Introduction

This paper aims to note the primary trends in space policy in the period from June 2009 to June 2010, a busy year for space activities worldwide. Many nations entered the process of reevaluating their space programmes and future policies; governments' space spending reached about a third (86.17 billion dollars) of the global space market (261.61 billion dollars), reflecting an aggregate growth rate of 16%, which demonstrates the value attributed to space activity.⁷⁴⁸

The United States continues to be the main actor and the most advanced space faring nation, with an estimated budget of 64.42 billion dollars, which accounts for 25% of the global market. It is followed and challenged by Russia, Europe (mainly as the ESA), China and India. The space club continues to grow. In recent years medium-sized and small states are interested in catching up with the traditional space faring nations by demonstrating similar capabilities in order to enjoy the added strategic, political and social values related to space activities. The period covered by this article reflects the continuation of this trend.

The rapidly growing space market makes it logical to assume that states that need space applications for daily use would turn to the procurement of technology and services. Nevertheless, evidence shows that many nations share the objective of developing a national expertise in space, demonstrating at least some indigenous space hardware production capabilities in order to join the "space club". Nevertheless, the space club is an informal club. As more and more nations expand their space activities and capabilities, there will be a need to organize and coordinate their activities. This process may demand the formalization of a space club.

6.1.1. Space as a symbol and a means of power

States that aspire to position themselves as more powerful and influential within the international community (or to preserve their status), use space programmes to demonstrate their power and convince the world, as well as their own citizens,

of their high status among other nations. The ability to develop and launch a satellite into space testifies to a high level of technological capability. This is even more significant as progress is geared towards peace, and military force cannot be used as much as in the past. Because it is becoming increasingly difficult to create deterrence by traditional means, states must find alternative means to increase their deterrent capability – instead of making a show of their military strength, they must rely more and more on demonstrating other capabilities.⁷⁴⁹ Presenting technological capabilities of a peaceful nature but with clear dual use potential, like these related to space, increases a states' status, power and deterrent capabilities.

This trend is evident across a wide range of nations, regardless of their size. It is manifested either in the form of upgrading existing programmes, or in the growing number of national space agencies and the increase in the overall international government space budgets. In the years 2006–2008 the total international government space budgets excluding the U.S. accounted for 6% of the global space market (12.46–16.44 billion dollars). In the year 2009, international government space budgets excluding the U.S. accounted for 8% (21.75 billion dollars) of the global market.⁷⁵⁰

The growing number of space agencies worldwide also illustrates the continuous interest nation-states show in having a national capacity to develop, produce, and operate space systems. In the early 1980s there were less than 20 national space agencies. Almost thirty years later, in the year 2009, there were almost 60 operating agencies. Britain and Australia, which are discussed below, traditionally refused to organize their space activities via a formal agency. But in 2009–2010 both of them reached the conclusion that only by forming a national space agency they would be able to fully exploit the potential of their capabilities and expertise in space technologies. The following statement by Lord Mandelson, Britain's Secretary of State for Business, Innovations and Skills, explains the British new approach: "As a focal point for this activity, we're launching our new Space Agency. This will have the muscle it needs to coordinate space policy and boost our international standing. It will bring together all UK civil space activities under one single management and give this sector the support it needs to grow."⁷⁵¹

Another aspect of this trend is the upgrading of existing programmes. In the past few years, Russia has reemerged as a space faring nation, boosting its space budget and restoring its space activities' potential and capability. Europe increasingly acts as a unified actor in the field of space, forming European space policies on various objectives and concerns. India continues to expand its space programme in two directions. First, by its ambitions to excel in space exploration embarking on human space-flight missions; second, by expanding its space activities into the realm of national security and military activity.

South Korea has been investing great efforts to upgrade its capability. Increasing funds for Korea's space programme is part of these efforts. Korea aims at bringing its space industry to a new level, as Seoul seeks to end its reliance on other states and keep pace with global developments.⁷⁵² In South Africa as well, independence and self-reliance play a role in the renewal of the space programme. Kazakhstan is another example of a nation that aspires to upgrade its space program. The Kazakh government expects to exploit the Soviet/Russian space infrastructure left in the country in order to develop a robust space programme and industry. This is part of the government's overall strategy to position Kazakhstan high in the international community, especially by developing satellite communication capabilities.⁷⁵³ Having a national capacity to explore and use space is of great significance to Iran too, as part of its overall struggle with the "imperialist powers".

Examining the space programmes and policies of many space faring nations allows for several conclusions regarding the major trends that emerge from their activities: (a) there is greater emphasis on international cooperation, (b) more nations expand their space activities to include national security missions, (c) the growing space market motivates nations to improve their industrial scale, capabilities and competitiveness by decreasing costs, improving and expanding the use of space applications and adopting efforts to miniaturise space technologies and products.

6.1.2. Greater international cooperation

The perception of space as a global commons, along with the fact that global economy and security are increasingly reliant on space, motivate the international community to find ways to cooperate and share global utilities from space. Hence, in the last year there is greater evidence of bilateral and multilateral ventures in space, as well as of more actions taken towards a greater coordination in space activities on a global scale. One example of this trend is the initiative to reach a U.N. space policy in order to better respond to the evolving challenges of the international space arena.⁷⁵⁴

In the period covered in this paper there were many cooperation agreements signed between space agencies. To name but a few: the Kazakh and Japanese space agencies signed cooperation accords in January 2010; Ukraine and China signed cooperation accords through 2015; Brazil and Belgium in October 2009; the U.S. and India expanded civil space cooperation between them; Russia and India consider a joint Moon mission; and India also signed an agreement with South Korea in January 2010.

The future of global activity in space would be even more dependent on international cooperation. The growing reliance of daily activities on space assets increases their importance and concomitantly their value. Cooperation is needed for the development of measures to assure their intact operation. The high costs involved in developing advanced space technologies for space research and exploration makes cooperation between nations a rational strategy for achieving worldwide human aspirations to go where no human has gone before. Many nations have become conscious of this fact worldwide. Jean-Jacque Dordain, Director General of the ESA, explained this perception very well in a speech in March 2009: “My dream is that the young generation perceives international cooperation not only as a tool, but as a culture, because the future requires a global view and a culture of international cooperation. The future is global, not individual, and it is certainly the most important message coming from space so far that the future of planet Earth and its inhabitants has to be addressed from a global standpoint.”⁷⁵⁵

6.1.3. Expansion of national security space missions

The increasing reliance on space-based systems for day-to-day activities on Earth, along with the growing number of reported satellite jamming events, lead nations to search ways of ensuring their access to space and their freedom of action in it. As a result, the number of space security programmes worldwide is increasing. In 2009 there was a 12% increase in the overall governmental military space budget (32 billion dollars).⁷⁵⁶

Concomitantly, there is a growing debate over the legitimacy and regulations regarding military space activities, especially in relation with “counter space operations” that prevent adversaries from interfering with the use of national space assets, as well as with the mitigation of the space debris problem. An important example is the case of Iran’s satellite jamming activity against BBC broadcasts, which was widely criticised and condemned by leading European Union countries and the UN-ITU.⁷⁵⁷ However, as it was noted by the Space Security Index of 2010: “despite efforts to construct a robust regulatory framework for space activities, the international community has been unable to reach consensus on an overreaching and legally binding space security treaty that reflects the current challenges facing an ever more complex domain”.⁷⁵⁸ On a national level, more nations, such as Australia, U.S., Japan, China, Russia, and India, took the issue of space security into account in their policies, programmes and statements. For example, after the successful Chinese test of an ASAT system in January 2007, India also declared its aspiration to explore the option of

developing ASAT.⁷⁵⁹ This important step was part of India's overall effort to expand its space activity into the realm of national security and military activity.⁷⁶⁰

Furthermore, a growing number of nations now seek to develop space situational awareness (SSA) capabilities. Improved international SSA capabilities can have a positive effect on the sustainability of outer space, because it would increase transparency. If shared, this information could also upgrade confidence in the international community, because it would allow for a better chance predict or prevent harmful interference with space assets. Nevertheless, it could also be used for negating the use of satellites. If so, it could have dangerous implications for the space environment.

Lastly, the high costs of developing and maintaining space-based systems in addition to technological advancements in space activities make the dual-use model more effective and affordable. The benefits of using the dual-use model are also recognised as a useful way of increasing the political cost of the harmful interference with space assets.

6.1.4. Commercialisation and industrial scale

In the last few years, world space activities are becoming increasingly commercialised. In 2009, commercial satellite infrastructure and commercial satellite services activities accounted for two thirds of the global space market.⁷⁶¹ As a result, many nations adjust their space policy towards achieving the development of an innovative infrastructure, as well as a wider more competitive industrial basis.

Furthermore, there is a growing trend for public-private partnerships and dual use ventures, which is expected to intensify in the coming years. The primary growing drivers are security missions, environmental monitoring (including climate change research), and energy supply. National agencies are looking to optimize the return of their investments by developing indigenous capabilities and emphasising the need for local industrial capabilities.

Another important issue is that nations are more concerned with the cost and time schedule management of their projects. Hence they are looking to make space activities more affordable by focusing on developing small scale – light weight satellites and miniaturising related technologies.

Although the number of nations that are active in space is growing as noted above, the following section will focus on the processes that took place in the United States, U.K., Australia, Israel and Singapore, as they represent the most notable changes during the period under examination.

6.2. American space policy and future space activity

The fact that the National space budget of the United States of America constituted 25% of the total space market in 2009 makes the U.S. the focal point for observing trends in space policies. Understandably, many nations look up to the U.S. when considering their own space activities and policies, by carefully observing U.S. objectives, goals and actions. The implications and effect of the new U.S. space programme made public by the Obama Administration in June 2010 is yet to be scrutinised and evaluated, but it will surely shade a light to the road ahead. In spite of this, it is reasonable to say that world space activities in the last year were greatly affected by events and measures that have taken place in the U.S.

The Obama Administration, which came into office in January 2009, inherited the 2006 Space-Policy established by the Bush Administration in the context of very different economic and political circumstances. In May 2009, only five months after entering office, the Obama Administration announced the creation of a “Review of United States Human Space Flight Plans Committee”, also known as the Augustine Commission. On the one hand, the readiness of the new Administration to deal with the setting of a new space policy so early in its tenure is a sharp and positive departure from the longer periods required by both the Bush and Clinton Administrations that waited years before making policy decisions regarding space and NASA in particular. On the other hand, the speed of the Obama Administration’s resolve in this matter has put the American space community into turmoil of uncertainty and instability at a very early stage.

The Augustine Commission released its final report and recommendations on 22 October 2009, heating up the debate over space activities in the United States.



Fig. 7: U.S. President Barack Obama speaking at NASA Kennedy Space Center (source: NASA/Bill Ingalls).

In the wake of the findings of the Augustine Commission, the Obama Administration unveiled a new direction for NASA in its budget request for 2011. Until then, there were three main programmes that occupied NASA: (a) the space shuttle, (b) the International Space Station (ISS), and (c) the Constellation Programme. The last two, are of international nature as they greatly rely on cooperation with international partners.⁷⁶² Hence, all discussions within the U.S. administration over the future of these projects attract a lot of international attention.

The ISS was set to be decommissioned in 2015, but the consensus is that the project should be extended until at least 2020, especially to avoid any loss of credibility vis-à-vis its international partners. President Obama supports this direction and has requested that this extension is reflected in the budget.

The future of the Constellation Programme on the other hand, is less certain. The Augustine Commission concluded that in light of delays and increasing costs in its development, the viability of the Constellation Programme should be re-examined. The committee went on to suggest that a more collaborative and commercially oriented effort with revised goals would be more feasible and cost-effective. The 2011 NASA budget practically calls for the cancellation of the Constellation Programme.

On 28 June 2010, the Obama Administration released a new National Space Policy. The document outlines the Administration's perspective and agenda about the significance of U.S. presence in space for the country's economy and national security. Overall, the goal of the new space policy is to strengthen U.S. leadership in space-related science, technology and industrial bases. In order to achieve this goal U.S. space organisations and agencies are required to follow several guidelines, including to "conduct basic and applied research that increases capabilities and decreases costs, where this research is best supported by the government; encourage an innovative and entrepreneurial commercial space sector; and help ensure the availability of space-related industrial capabilities in support of critical government functions".⁷⁶³

Many of the principles, goals and objectives of this document are found in earlier space policies and reflect long-standing U.S. views on the use of outer space activities and the objectives pursued through it. Nevertheless, the Obama Administration policy adds several new terms, such as sustainability, responsible behavior, and stability. It also emphasises the importance of expanding international cooperation with U.S. allies, even when it comes to space security concerns.⁷⁶⁴

In the field of space security, the Obama Space Policy emphasises the need to develop and implement plans, procedures, techniques and capabilities necessary to conduct critical national security space-enabled missions, by rapidly restoring

space assets and leveraging allied, foreign and commercial space and non-space capabilities in order to help in accomplishing these missions.⁷⁶⁵

The Obama Administration Space Policy signals the U.S. direction for the coming years, but eventually it will be the concrete U.S. decisions, actions, allocation of funds and positions taken in international forums and cooperation ventures that will reveal the true nature of the U.S. Space Policy and activities in the years to come.⁷⁶⁶ When it comes to the guidelines regarding greater international cooperation, the challenges ahead involve improving and enabling cooperation with allies, both on a technical and an operational level.

In conclusion, the uncertainty and instability of the American space programme is currently assessed by other spacefaring nations that await for more clarity on future opportunities and possibilities regarding American space activities.

6.3. United Kingdom

Although during the 1950s and 1960s the U.K. was one of the world's leading nations in space activities, especially in the field of rocketry, and it had successfully developed a satellite launch capability, it decided in the late 1960s to discontinue its launch programme. Consequently, the British launch into space in October 1971 was the first and last one. Traditionally, the U.K.'s main preoccupation was to make space technology more cost-effective. As a result, the country relied heavily on the United States, ESA and commercial companies in order to satisfy its space related operational requirements. Over the years, the U.K. space activity has centred on areas of high commercial potential, such as Earth observation, communications, navigation and space science for environmental and economic development purposes.⁷⁶⁷ Currently, the U.K. is only the fourth largest contributor to ESA.

In the last few years, there has been a growing debate in the U.K. over the scope and size of its space activities. Gradually, it was recognized that the U.K.'s space programme should be re-examined. In 2009, a dedicated task-force was appointed in order to map out the future opportunities of the country's space sector in the world space market. The primary objective was to establish the U.K. as one of the world's leading space nations, increase the U.K.'s share of the global space market to 10% and transform the U.K. space sector into a prominent part of the country's economy. The task-force's work and recommendations were summarised in a report entitled "A U.K. Space Innovation and Growth Strategy 2010–2030", which was released in December 2009.⁷⁶⁸ The release was followed by a decision to establish a dedicated space agency to direct the country's space policy and activities,

stating that “with coordinated action we can create a comparative advantage for the U.K. technology and services. We can secure greater wealth creation, more jobs and enhanced intellectual leadership”.⁷⁶⁹

6.4. Australia

Throughout the years, Australia has shown little interest in having a national space capability. The Australian government has not made any major efforts to develop indigenous space technologies. As a result, Australia relies heavily on commercial suppliers to meet its operational demands and takes pride in being a “sophisticated user” of space applications. Nevertheless, 2009 saw a significant change in the Australian approach to space activities.

In 2008, there were several attempts to change the Australian space policy. Several papers on this issue were published⁷⁷⁰ and the Senate Economics Committee released a detailed report on their space inquiry entitled: “*Lost in Space? – Setting a New Direction for Australia’s Space Science and Industry Sector.*” The report called for the establishment of an Australian Space Agency and for the immediate implementation of all necessary steps to coordinate Australia’s space activities and reduce its reliance on other countries in the area of space technology. The committee also recommended that a Space Industry Advisory Council should be established, comprising of industry, government, academic and defense officials, chaired by the Minister for Innovation, Industry, Science and Research. This council would guide the development of the national space agency.⁷⁷¹

In a response released in November 2009, the Australian government noted the recommendations of the committee. Furthermore, it committed in the 2009–2010 budget 48.6 million Australian dollars to establish an Australian Space Science Programme over a period of four years, in order to improve the country’s capacity to independently develop and utilise space technology.⁷⁷² This development marks a significant change in the Australian approach to space activities.

6.5. Israel

In Israel, the space community underwent a long and comprehensive process of reevaluating its space related objectives and policies in the last few years. This

process reached a peak in November 2009, when the President of Israel Shimon Peres and the Prime Minister Benjamin Netanyahu appointed a task-force⁷⁷³ to examine the Israeli space programme and recommend a framework for a new national space program. The main objective of the task-force was to focus on civilian and scientific applications that would allow Israel to develop a greater industrial scale and competitiveness in the growing global space market. The task-force submitted its report and recommendations in June 2010.⁷⁷⁴

The report outlines Israel's strengths, weaknesses, opportunities and challenges for achieving its goals in space. The task-force document argued that Israel has a great potential to lead in space technologies development in specific areas, but it is gradually losing its competitive edge because of insufficient investments. Therefore, governmental action and subsidies are needed. Sufficient funds backed by government support could upgrade Israel's competitive edge, placing it among the top five space faring nations. For this reason, the task-force recommended to invest in space research and activities 300 million new Israeli shekel annually for a period of five years, in addition to defence related expenditures. The research areas suggested for funding included satellite miniaturisation, communication, fundamental and applied research. It was also stated in the report that Israel should promote international cooperation with other established and emerging space faring nations. The report was adopted by both the Israeli President and Prime Minister. The aim of the government is to include the new programme in the 2011 national budget and therefore achieve some progress towards its declared objectives already in 2011.⁷⁷⁵

6.6. Singapore

In the last few years Singapore is looking for ways to increase its status in Asia. Positioning itself as an emerging space faring nation is one of the strategies taken for achieving this goal. For this reason, Singapore is searching for ways to increase its activities and capabilities in the global civil space market. For example, Singapore designed and developed the X-Sat LEO micro-satellite,⁷⁷⁶ which is scheduled to be launched at the end of 2010. This is a technology demonstration project undertaken as collaboration between the Nanyang Technological University and different Singaporean organisations. Its main mission is imaging over Singapore and satellite-based advanced data acquisition and messaging over the Indian and Pacific Ocean. Another example of this process is the annual space show hosted by Singapore in the last few years. The show, which is the largest in Asia, aims to bring together leading aerospace industries and agencies under one

roof for better discussion and cooperation. For Singapore, here is a technological and an economic potential. The statement by the senior Minister of State for trade and industry and education, S Iswaran, at the opening of Global Space and Technology Convention–Satellite Technology Asia on 28 January 2010 that Singapore can serve as a catalyst for further growth of the space industry in Asia manifests the importance attributed to space.⁷⁷⁷

To conclude, the global space environment is rapidly growing and constantly changing. The examples provided in this chapter reflect the new trends in space policy identified in the last year. All five nations' policies examined above demonstrate the importance attributed to indigenous capabilities, international cooperation, greater commercialisation and industrial production scale, as well as to the sustainability of space-based systems.

⁷⁴⁸ The Space Report 2010, Space Foundation, p. 39.

⁷⁴⁹ Ben Israel, Isaac. Presentation. Space Research and its Applications. Yuval Ne'eman Workshop for Science, technology and Security, Tel-Aviv University, December 2002. In 2005, Prof. Ben Israel was nominated as Chairman of Israel's Space Agency.

⁷⁵⁰ Data was obtained from the Space Foundation 2006–2010 annual space reports.

⁷⁵¹ <http://webarchive.nationalarchives.gov.uk/+http://www.bis.gov.uk/news/Speeches/mandelson-uk-space-agency-launch>.

⁷⁵² NTIS, World News Connection, ROK Daily: Korea to Invest W316 Bil. in Space Research *Chosun Ilbo WWW*–Text, Thursday, January 17, 2008.

⁷⁵³ For more information: <http://centralasianewswire.com/viewstory.aspx?id=2046>, Accessed November 29, 2010.

⁷⁵⁴ Yepes, C.A., “Towards a UN Space Policy”, ESPI Perspectives, 23, Vienna, European Space Policy Institute, (June 2009).

⁷⁵⁵ International Cooperation in Space, Remarks of Jean-Jacques Dordain, Director General of the European Space Agency at the 40th Anniversary of the Universities Space Research Association (USRA), 26 March 2009, Available at: http://www.usra.edu/galleries/default-file/09Symp_Dordain.pdf accessed on 28 November, 2010.

⁷⁵⁶ Data was obtained from the Space Foundation annual 2010 Space Report and Euroconsult reports.

⁷⁵⁷ Theodoulou, Michael, “Tehran Told to End Satellite Jamming”, The National, 21 March 2010. <http://www.thenational.ae/apps/pbcs.dll/article?AID=/20100322/FOREIGN/703219849/1002/FOREIGN> 13 July 2010.

⁷⁵⁸ Space Security Index 2010, p. 2.

⁷⁵⁹ Milowicki, G., and Johnson-Freese, J., “Strategic Choices: Examining the United States Military Response to the Chinese Anti-Satellite Test,” *Astropolitics*, 2008, Vol. 6, No. 1, p. 5 (1–21).

⁷⁶⁰ For a detailed information on the Indian approach to national security space activity, doctrine and motivation see: Nair, K.K., *Space–The Frontiers of Modern Defense*, (New-Delhi: Knowledge World in association with the Center for Air–Power Studies), 2006.

⁷⁶¹ The Space Report 2010, p. 30.

⁷⁶² It should be noted that so far, no international contracts were signed regarding the Constellation Programme.

⁷⁶³ National Space Policy of the United States of America, 28 June 2010, p. 5. http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf 12 July 2010.

⁷⁶⁴ Kueter, Jeff, “Evaluating the Obama National Space Policy: Continuity and New Priorities”, Marshall Institute Policy Outlook, (July 2010), p. 1. <http://www.marshall.org/pdf/materials/900.pdf> 12 July 2010.

⁷⁶⁵ National Space Policy of the United States of America, 28 June 2010, p. 17. http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf 12 July 2010.

⁷⁶⁶ Kueter, J., (July 2010).

⁷⁶⁷ Burleson, Daphne, *Space Programs Outside the United States*, Jefferson, North Carolina: McFarland & Company Publishers, (2005): 306.

⁷⁶⁸ A U.K. Space Innovation and Growth Strategy 2010–2030: 4.

⁷⁶⁹ Ibid: 9.

⁷⁷⁰ Among these papers are: Biddington, Brett, “Skin in The Game: Realizing Australia’s National Interests in Space to 2025” The Kokoda Foundation, paper no. 7, (2008),. Holt, Lyle., “Integrating Space Efforts into Australia’s Joint Operations,” *Australian Defense Force Journal*: 175, (2008): 51–65.

⁷⁷¹ For more on the issue of future Australian space advancement: Merrett, Nicholas. “New Directions for the Heavens From National Security Statements,” *Australian Defense-Business Review*, (January-February 2009): 43–47.

⁷⁷² Australian Government Response to the Inquiry By the Senate Standing Committee on Economics Into the Current State of Australia’s Space Science and Industry Sector, November 2009.

⁷⁷³ The task force was headed by Mr. Menachem Greenblum, Director General Ministry of Science and Technology and Prof. Isaac Ben Israel, Chairman of the Israeli Space Agency.

⁷⁷⁴ Paikowsky, Deganit, and Levi, Ram, “Space as a National Project – An Israeli Space Programme for a Sustainable Israeli Space Industry, Presidential Task-Force for Space Activity Final Report”, Jerusalem: Israel Ministry of Science and Technology (June 2010), Hebrew.

⁷⁷⁵ Coren, Ora, “Reaching for the Stars – A new space race, fueled more by profit than by national pride, has begun, and Israel wants in”, *Haaretz daily news paper*, (5 August 2010), <http://www.haaretz.com/print-edition/business/reaching-for-the-stars-1.306093>. 6 August 2010.

⁷⁷⁶ For additional information on the X-Sat mission: <http://www.dlr.de/iaa.symp/Portaldata/49/Resources/dokumente/archiv4/IAA-B4-0506P.pdf>.

⁷⁷⁷ <http://www.zdnetasia.com/s-pore-space-industry-nascent-but-progressing-62062359.htm>, accessed on November 28, 2010.