

Recent Developments in Space Law (5)

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MIND THE GAP: LEGISLATING FOR COMMERCIAL SPACE ACTIVITIES

ABSTRACT

Regulatory tools are a necessary corollary to national and regional space programmes and policies and there has been a noticeable increase in the legislative moves by states interested in developing their commercial space sector. Some national statutes already serve as regulatory prototypes, providing an insight into issues such as risk regulation. Now, the surge in space technology appears to be lessening the traditional divide between old and new space faring nations.

Emerging space countries can now focus on new space markets that are driven by technology itself. Choosing the appropriate regulatory form to cover the breadth of space-related activities, from human space flight through to earth observation and satellite-based navigation services, to name but a few, could become a challenge: technology will continue to push the limits of the application and interpretation of relevant space laws, and the international rules in particular. Building bridges between the law regulating space activities and other areas may then become necessary. Suborbital space flight and GNSS are examples of areas where legal certainty can be achieved through such bridge building between related regulatory environments.

This paper addresses the bifurcation that has been emerging over the past years within the law governing space activities. Whereas earlier domestic space laws often took on the form of general statutes, as expressions of national legal and administrative culture, recent space activities and tools reflect the growing interaction between a broader spectrum that ranges from (international and domestic) space law through to legal rules of private and public law, including telecommunications. The paper addresses whether the growing division between terrestrially-based and outer space-related activities might impact on the future scope of space law. It also emphasises the importance of maintaining consistency between regulation at national and international level, and the need to maintain the concepts of international state responsibility and international state liability, already anchored in international space law. These can be critical to the commercial space sector.

INTRODUCTION

It has been commented in the recent past that space law is undergoing a bifurcation.¹ This term has been used to describe the separation of those space activities that take place (only) in outer space, from those that take place on a near-earth or predominantly terrestrial basis. The view taken at the time was that terrestrial activities would become dominant, setting this field apart from the international outer space regime for exploration-related activities, leaving newer developing fields to be governed by rules of general or special laws. This foresight was well-founded. The terrestrial impact of space-related activities is indeed increasing over time.² The concept of bifurcation predicts that space law, as we currently know it, will diverge into two (main) regulatory fields, the one based on international space law, governing space exploration, launching activities, human space flight and satellites, the other governing terrestrial based space-activities that rely on technology-enabling tools which are designed to ensure the use of (aero)space and space-derived information products and support services. This has led to reliable predictions about the impact of commercial space business, including the downstream space sector, on the existing regulatory regime.³ The subject of suborbital flight services are not taken any further within this paper; the

¹ Buhlmann, U. and Martinez, L. 2007. 'Fly Me to the Moon, Legal and Political Considerations of the Space Exploration Initiatives', in *Proceedings of the 49th Colloquium on the Law of Outer Space*, 117–30. See further, F. Lyall, P. Larson, *Space Law, A Treatise*, 2009, Ashgate, Surrey, GB, 45ff.

² For further insight into the potential for dedicated downstream services in the European Union, see the Estonian conference held in Tallinn in 2010, <http://www.satfuturis.com/>

³ See the various contributions and particularly the Reports of the Working Groups contained in K.-H. Böckstiegel, "*Project 2001*" – *Legal Framework for the Commercial Use of Outer Space*, 2002, Heymanns, Köln.

discussion on its ultimate status, with the exception of developments in the United States under federal and state law, has not yet found general consensus, at least not in Europe⁴ and is still subject to discussion at UNCOPUOUS level.⁵ Independent of this, it is not clear yet whether a business case has been made for developing this market anywhere other than in various US and nearby Caribbean jurisdictions.⁶

GROWTH OF COMMERCIAL SERVICES

Reliable reports indicate that demand for space services is currently expanding beyond G2B and B2B needs, with new openings emerging for the B2C level; industrials involved in the manufacturing and launching of satellites, as well as developing space services, are looking towards creating 'one stop shops'.⁷ This permits manufacturers of spacecraft, as did once the automobile manufacturers, to develop the technology and hardware and then look to marketing their products and services directly. In the sphere of outer space, it is already materialising as a longer-term trend towards selling space services, whether for launches or other space-related activities, including space-based information products or services. With telecommunications and satellite broadcasting commanding the largest commercial and consumer-user bracket, by providing the outer space links on which terrestrial services rely, newer, creative examples of satellite-based products and support services are underway: maritime vessel tracking is only one example taken from the maritime sector.⁸ Using AIS dedicated satellites, including tools that allow satellite coverage to connect with vessel-based transponders on container transport, public authorities and the commercial sector can track fleet progress, enabling

precise location of vessels.⁹ This is a response to the need for high level security control, be this for coast guard services or fiscal supervision. One such European AIS satellite is expected to be launched by the German Space Agency next spring. A further example includes the design of complementary satellite monitoring systems to enable air traffic control and coverage over the vast geographical stretches, where radar coverage is currently incomplete. Rules are also underway for implementing the policy sides of dealing and accessing information obtained through the Global Monitoring for Environment and Security (GMES) Sentinels.¹⁰ Global Navigation Satellite Systems (GNSS) and European Satellite Data Relay (ESDR) are further examples of areas where downstream products and services are about to follow. Climate change, environmental monitoring, traffic management and other concerns ranging from security through to debris mitigation control are all drivers for developing new and further space applications.¹¹ In turn, such developments lead to a growth of technical guidelines or 'soft law' rules applying at operational level; these are posing challenges to a regulatory system that was once exclusively structured on principles of international treaty and national law.¹²

DATA SHARING

Such services as those described rely on a mix of types and sources of processed space data. Much thought is being spent on how to devise systems for data exchange that will encourage effective access and use of data across the various user communities.¹³ However, despite the interest in

⁴ For a recent review of developments at federal and state level in the United States, see P. Stern, L. Tennen, in Ram Jakhu (ed), *National Regulation of Space Activities*, 2010, Springer, 467 ff.; J-B. Marciacq, Y. Morier, F. Tomasello et al., *Towards Regulating Sub-Orbital Flights. An Updated EASA Approach*, in: *Publications of the 61st International Astronautical Congress 2010/American Academy of International Aeronautics*, 2011, IAC-10-D2.9.5.

⁵ Committee on the Peaceful Use of Outer Space, *Report of the Legal Subcommittee on its 50th session*, UN GA A/AC.105.990 of 20 April 2011

⁶ The potential of a former air force base at a coastal location in Scotland is currently under discussion in the UK for suborbital launches.

⁷ I. Scharlach, in: Smith/Baumann (eds), *Contracting for Space, Overview of the European Space Sector*, Ashgate, 2011, 257-266.

⁸ Global Maritime Domain Awareness is an inter-agency project of the US government geared to securing global maritime interests, see www.gmsa.gov [accessed 30 September 2011]

⁹ For details of a recent conference on commercial use of AIS in vessel tracking, see <http://www.aissummit.com/>

¹⁰ Regulation EU 91/2010 of 22 September 2010 on the European Earth monitoring programme GMES (GMES Regulation), OJ L 276 of 20 October 2010. See further, L. Mantl and S. Keinz-Huber, *The Legal Framework for EU Activities in the Space Sector*, with a particular focus on GMES; in Smith/Baumann, *Contracting for Space*, n. 7 above, 69-83.

¹¹ Adherence to the UN Space Debris Guidelines of the Committee on the Peaceful Use of Outer Space, has been required practice for all ITU registrations for some time. These are available at <http://www.iadc-online.org/index.cgi>.

¹² F. Lyall, P. Larson, *Space Law, A Treatise*, n. 1 above, 559ff.

¹³ On the importance of such systems, e.g for the EU, see <http://ec.europa.eu/environment/seis/>. The Charter on Charter On Cooperation To Achieve The Coordinated Use Of Space Facilities In The Event Of Natural Or Technological Disasters Rev.3 (25/4/2000).2 (*Disaster Charter*) contains a system for activating its use, leading to the exchange of

improving direct benefits to user communities, not all data exchange systems find favour. Funding is one reason behind the reserved approach towards data sharing. While the agencies generally respond to costs by operating a variable cost scale (Cost of user Request, CFUR), the exact status of the user determines the financial impact of data cost. Where security interests are involved, however, data sharing and inter-operability may not be seen to ensure the level of security required, leading to corresponding limitations on access.¹⁴

Now, some countries require their satellite operators to submit their data policy in the course of the licensing procedure, as a means of checking how data access is regulated.¹⁵ Data access policies generally contain a degree of restriction, particularly where extraction, use and re-use of derivative data are involved. This effectively limits greater access to data for those very business communities interested in developing secondary data services or markets. This is somewhat of a paradox, given the interest in moving towards effective data sharing.

REGULATORY ARCHITECTURE

These developments are leading to a more open debate about how and to what extent the data policies and access rules should be regulated. Space activities relating to space data, including its distribution, are a subject that primary legislation often regulates at entry level, particularly with sensitive data.¹⁶ However, as with many technological developments, debate and regulation are often *ex post*. Not only have the freedom of information statutes facilitated broader access to

space data in certain countries; the user community bracket itself is also moving towards greater data sharing systems, as can be seen from initiatives such as the EU INSPIRE Directive¹⁷ and the creation of shared environmental information systems, SEIS.¹⁸ There is also growing opportunity for data retrieval: with the commercial and research-based space sector increasingly developing its own capability, notably through (micro-) satellites, sensing activities can be carried out reliably by the commercial sector. This is the major reason for regulating sensing at national level within a national space law.

The regulation of the commercial space sector is an issue addressed by governments in their own space laws and policies. Originally, given the importance of international responsibility and liability, national space laws were a focus for launching states. Over time, the focus is moving towards the whether, to whom and under what conditions space data should be retrieved and distributed; in other words, who may access space data and under what conditions should it be made available for processing and distribution for further use? Some governments have enacted specific rules as to private remote sensing, allowing some predictability for the commercial sector. The UN Remote Sensing Principles technically do not apply to the private commercial sector, and this too, has led to calls for their revision.¹⁹

Space derived data is raw and is effectively unusable until the processing has been carried out. Once the space data is processed and thereafter integrated with other digital information overlays, essential new products and services can be developed. This in turn gives way to new legal questions. One pending issue is the effect of value-added processing on the rules of civil liability for information services where there is a failure to provide the product or service expected or where the information is defective.²⁰ Such issues are currently under examination within the context of

essential information and assistance, see further <http://www.disasterscharter.org/home>

¹⁴ One example of a PPP involving data sharing at EU level in collaboration with the European Defence Agency has been MUSIS, see <http://www.eda.europa.eu/Capabilitiespriorities/coredrivers/Space/Earthobservation/MUSIS>. It appears that the project is not continuing.

¹⁵ R. Tremayne-Smith, in: Smith/ Baumann (eds), *Contracting for Space*, n. 7 above, 111-116. In the context of this paper, terrestrial space products and services are referred to, for easy reference, under the categories of earth observation and remote sensing activities, navigation and communication. The common GNSS terms for navigation, communication and observation have since given way to position, navigation and timing, see further <http://www.pnt.gov/>.

¹⁶ See e.g. the German Satellite Data Statute, *Satellitendatensicherheitsgesetz 2007*; both the French *Loi sur Les Operations Spatiales (LOS) 2008* and the UK *Outer Space Act 1986*, for example, include data operations within their regulatory ambit.

¹⁷ Directive 2007/02 EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), (2007) OJ L 108/1

¹⁸ For further details of SEIS, see <http://ec.europa.eu/environment/seis/> [accessed 30 September 2011].

¹⁹ F. Lyall, P. Larson, *Space Law, a Treatise*, n. 1 above, 64; 411

²⁰ The field of civil and state liability is too complex to allow a full treatment of the principles of liability here, see G. Brüggemeier, *Haftungsrecht- Struktur, Prinzipien, Prinzipien, Ein Beitrag zur Europäisierung des Privatrechts*, 2006, Springer.

GNSS satellite navigation systems.²¹ This will involve a policy decision as to whether satellite navigation systems that are offered free of charge can give rise to liability claims from users in the case of damage caused by defective systems. Further questions will arise over time as to the reliability of digital space-based maps.

COMMERCIAL STRUCTURE FOR SPACE INFORMATION

The variety of space-based products and services demonstrates how, with the appropriate software, key space technologies can be used to serve a spectrum of public service functions that can be operated as commercial activities. Demand for such services is likely to increase over time and the interest in supporting the trend towards commercialisation is keen.²²

Directly related to this is the question of accessibility. Data policies that over-restrict access to data or prohibit the re-use of space-derived information are coming under increasing pressure to react to growing demands for information. This has consequences for the management of commercial space activities. While there are genuine strategic reasons behind restrictions such as those, for example, underlying Resolution 40 of WMO policy relating to open exchange of weather information, particularly for the commercial sector,²³ there may be other sectors where the re-use prohibition could be reconsidered in the light of what might appear (over-) restricted access.

Remote sensing is still an area where predominantly public funding and agency-owned satellites are active. This makes accountability of the commercial operators reasonable, in view of the public support they receive. Governments are already looking to purchase data from the commercial sector in response to increasing

demand and technical development. Nevertheless, the involvement of private actors in the space-derived information market calls for transparency.²⁴ This applies irrespective of the criteria set by freedom of information laws. Designing a model for the private commercial sector to remain involved in the long-term management and distribution of government-financed space information is an ongoing challenge.

This debate is best tackled by appropriate methods of cooperation between the commercial and public sector. This may be a model using service level agreements (SLAs) between operators/providers and users or other forms of cooperation known within agency projects e.g. through the European Space Agency, providing its Sentinel Satellite capability for the European Union project GMES. Avoiding over-diversity in the categories of what can be done to access and distribute the data, through defining legitimate extraction and use of derivative data across the space sector, is a major goal. This applies, irrespective of security issues raised by high-resolution observation satellites.

FROM SPACEFARING TO EMERGING SPACE NATIONS

The downsizing brought by technological progress has served as a major impulse to the growth in the number of nations developing space capabilities. Firstly, not only has there been an increase in the number of launching states, with India and China currently among the front runners in the lower cost launching states.²⁵ Secondly, a space-faring history is no longer a pre-requisite to involvement in downstream space business. Space activities, while costly to the extreme, no longer require quite such inordinate investment. The development of the micro-satellite is opening up new space markets.²⁶ With micro-satellite launching prices already available in the region of \$ 200,000, the costs of involvement in space are already falling below the upwards sums generally associated with standard payloads.

Small states can transcend traditional economic barriers to become part of what is in any event a global project.²⁷ Space activities serve competition and competitiveness; they permit outward investment and create new and specialist, secondary markets.

²¹ See the discussions within UNIDROIT on the inclusion of this subject in its annual study programme, see <http://www.unidroit.org/english/workprogramme/study079/main.htm>. See also the results of the 2009 ESPI workshop on the subject, http://www.espi.or.at/index.php?option=com_content&task=view&id=360&Itemid=37 [accessed 20 September 2011]

²² See for example the secure telecommunication services operated by Paradigm (Astrium) for the UK military, <http://www.paradigmsecure.com/> [accessed 20 September 2011]

²³ See WMO Resolution 40 and the Guidelines for commercial activities, available at http://www.wmo.int/pages/prog/www/ois/Operational_Information/Publications/Congress/Cg_XII/res_40_en.html

²⁴ M. Gerhard, Art VI Outer Space Treaty, in: Cologne Commentary on Space Law (CoCoSL), vol. I, Hobe/ Schmidt-Tedd/ Schrogl (eds).

²⁵ See Yun Zhao in: Ram Jakhu (ed), *National Regulation of Space Activities*, n. 4, above, 247-266.

²⁶ Clyde Space, Glasgow, is currently building the UK's first micro-satellite to be launched out of India. www.clydespace.com

²⁷ J.M. Logsdon, *Space Policy* 24 (2008) 3-5.

The overriding international economic framework for such activities, shaped through membership of regional economic organisations such as the EU or, at international level, within the framework of the WTO, dictate that competitive aspects such as public procurement are opened to international level. This has already been tested within Europe for the Galileo tender under both EU and WTO law.²⁸ It allowed the non-prime sector to be included within the main procurement and, particularly in non-security related contracts, a broader group of firms to be considered within the tender.²⁹ In this way, the interests of SME's could be considered across the various project phases. Once again, it confirms that space products and services are global markets, requiring consistent and transparent regulation.

LEGAL HARMONISATION

Such developments as these appear set to continue, with an increase in the number of nations participating in the benefits brought by developments in space technology.³⁰ This heralds progress in bridging the digital divide, encouraging growth in infrastructure and making space accessible through the tools for communication, observation and technology.

Concerns do, however, remain about how the spectrum of space-related services and products can be best supervised and coordinated at national level.³¹ There is an interest in ensuring continuity of the international space law regime at national level. The exact content of national space rules remains a policy decision of the particular state. Not all national space statutes, however, specifically regulate activities involving space data.³² As long as the field of national space law is not harmonised, regulatory diversity between national space legislations could even lead to low regulatory jurisdictions. Concerns such as outflagging are not

unknown.³³ Firstly, a state has no control over foreign satellites carrying out sensing over its territory. Secondly, there is a need to ensure that private commercial interests dealing with space-related data and downstream information products remain controlled and coordinated. Currently, at least in Europe, solutions such as exclusive licences have been created at national level, with the model of PPPs gaining favour as a means of balancing the varying interests involved in the space sector.

With the increasing online availability of space-related products and services, there will be an increasing number of cross-border legal conflicts. This has already been tested in relation to the application of the EU's data protection rules to Google and Google Street View in Europe.³⁴ Monitoring global corporations is a challenge in itself, the task will not alter towards companies involved with space technology.³⁵ It is interesting to note that the recent space law for Austria provides for the pending legal conflicts to be resolved by the rules of private international law.³⁶

ACCESSION TO INTERNATIONAL CONVENTIONS

In the light of the technology drive, it is legitimate to reflect on the current status of accession to the international space conventions: firstly, should all states be encouraged to accede to the major space treaties, whether or not they are space faring nations in the traditional sense? Secondly, will the divergence between states having national space laws, that is, the substantive content of the national law itself, taken together with the level of state accession to the major space Conventions, have a longer-term bearing on the development of state

²⁸ L.J.Smith, European Competition Law, in: v.d. Dunk/ Marchisio, (eds), *National space legislation in Europe*, 2011, Brill, Leiden, chap. 11

²⁹ The procurement for Galileo was carried out by the EU institutions in terms of its Financial Regulations, see L.J.Smith, European Competition Law, n. 28, above

³⁰ An online register of space objects is available from UNOOSA, see <http://www.oosa.unvienna.org/oosa/osoindex.html> [accessed 13th September 2011].

³¹ For details of the UN COPUOUS Resolution on Launching State and recommendation on registering space objects, see L.J.Smith, *The Principles of International Space Law and their Relevance to Space Industry Contracts in Smith/ Baumann, eds) Contracting for Space, 45-58, 2011*
³² See J. Hermida, in Ram Jakhu (ed), *National Regulation of Space Activities*, n. 4 above, 23 ff.

³³ Lyall, F. 2006. 'Small States, Entrepreneurial States and Space', in *Proceedings of the 49th Colloquium on the Law of Outer Space*, AIAA, 382-90.

³⁴ Google failed over a longer period to comply with the rules applicable within the EU on data retention, maintaining that, as a foreign corporation, it was not subject to the jurisdiction of the EU. Further issues arose with the operations of Google Street View. For further reports of the ongoing privacy dialogue in the EU, see the reports of the Art. 29 Working Group on Data Protection, http://ec.europa.eu/justice/policies/privacy/working_group/wpdocs/index_en.htm [accessed 30 August] 2011].

³⁵ See Peter Malunczek, Nationality of Transnational Corporations and Space Law – in the Light of the Economic Globalisation Process, in: K-H. Böckstiegel, Project 2001, n. above, 521-524

³⁶ A regularly updated index of national space laws is available under http://www.oosa.unvienna.org/oosadb/browse_all.js.jsp?dims=COUNTRY_CODEDATE.

practice in the field of space activities? The low level of compliance with various key governance procedures for space activities, notably registration, compounds the dilemma.³⁷ Prototype statutes have been recommended in the recent past, so-called 'building blocks', with a particular focus on Europe.³⁸

Harmonisation of space law at national level within the EU has, however, been excluded in terms of Article 189 (4) Treaty of Lisbon. Sovereignty concerns apart, an uncoordinated approach to space legislation may, in the long run, prove to be a weakness. These space statute prototypes have served as role models, particularly in catering for the development of private commercial space activities at national level. At the same time, there have also been calls for a revision of the UN Remote Sensing Principles regarding data distribution and marketing.³⁹

GOVERNING DOWNSTREAM ACTIVITIES

The last major international convention to be agreed on was the Registration Convention. As has been recently commented, there appears to be 'little enthusiasm' at present for further convention law within this area.⁴⁰ If commercial activities in outer space are to increase at the level predicted, then there is a recognised need to ensure that states continue to fulfil their central role in monitoring national state activities. This is required by Article VI Outer Space Treaty. Firstly, as mentioned, state practice on issues such as registration shows falling levels of compliance.⁴¹ Secondly, commercial space activities taking place at a global level require consistent regulation. States must ensure that space activities undertaken by their nationals in foreign jurisdictions remain subject to national licensing, as required by international law, with appropriate control of these activities in the local, foreign host jurisdiction and, where necessary, even bilateral

agreements.⁴² The goal of compatible provisions for licensing space activities at national level has its origin in the international law of outer space.

BIFURCATION IN THE TWENTY FIRST CENTURY

The trend towards diversification in downstream markets stems depends on tools developed for satellite-based services: this generally covers the field of information products and services. Large sectors of this area are - over and above any content prescription within the satellite data policy itself and security issues - subject to special areas of law such as IP, communications and media law.⁴³

Various primary information-rich essential services have traditionally operated out of international satellite organisations such as World Meteorological Organisation, WMO and the European Organisation for the Exploitation of Meteorological Satellites (Eumetsat) designed to provide weather data to the weather offices of their member states and cooperating countries.⁴⁴ As international organisations, their activities fall within the classic regime of international law.

Mobile satellite telecommunication and direct broadcasting services, now supplemented by digital audio broadcasting, involve compliance with the international rules of outer space and the radio regulations of the International Telecommunications Union regime (ITU). The licensing of telecommunication operators and the allocation of frequencies remain a matter of national law and with this, an integral part of the international ITU regime. Telecommunications remain by far the largest field of commercial space activity. It is also the largest sphere of law that has been harmonised at national, certainly within the EU.⁴⁵

The majority of satellite data policies contain rules on accessing and licensing data. Space data derived from earth observation projects is collected and

³⁷ B. Schmidt-Tedd, S. Mick, Art. VIII Outer Space Treaty, Cologne Commentary on Space Law, CoCoSL, Vol I, 2009.

³⁸ M. Gerhard, and B. Schmidt-Tedd, How to adapt the present regime for registration of space objects to new developments in space applications, (2005) *Proceedings of the 44th Colloquium on the Law of Outer Space*, 353, 359.

³⁹ K-H. Böckstiegel, Project 2001- Legal Framework for the Commercial Use of Outer Space, Cologne, Heymanns, 2002, 613.

⁴⁰ P. Dempsey in Ram Jakhu (ed), *National Regulation of Space Activities*, n. 4, above.

⁴¹ See the Reports of the COPUOS Legal Subcommittee 2010 and 2011, available at <http://www.oosa.unvienna.org/oosa/en/COPUOS/Legal/index.html>

⁴² The Nottebohm decision of the International Court of Justice established the need for a genuine or real link between a state and its nationals, *Liechtenstein v Guatemala*, [1955] I.C.J.Rep.4

⁴³ The future of robotic development is not further reviewed here.

⁴⁴ See Ph.I. Diederiks Verschoor, *Introduction to Space Law*, ed Kopal, 3rd ed. 2008, for further information on privatisation of the satellite organisations; further, Smith/Baumann *Contracting for Space, An Overview of the European Space Sector*, 2011.

⁴⁵ For a more detailed treatment of the current EU telecoms regime, see P. Achilleas, *Droit de l'Espace, Télécommunication- Observation – Navigation – Exploration*, 2010, Larcier.

thereafter processed into a variety of information products and services. The majority of jurisdictions require activities with space data to be notified, approved or licensed; France requires a declaration; the UK Outer Space Act prescribes approval for dealing with it; and in Germany, the special statute *Satellitendatensicherheitsgesetz* of 2007, passed in response to the development of high-resolution satellite technology, foresees an administrative notification requirement as a form of self-assessment as to whether or not the data is sensitive.⁴⁶ Any commercialisation of the relevant space information requires a coherent structure at government level for its subsequent management and distribution.

COHERENT APPROACHES THROUGH PUBLIC PRIVATE PARTNERSHIPS

A coherent approach to the development of management structures for the downstream space community, accompanied by coordinated data policies, could be one way forward towards creating transparency at governance level. This would reduce the effects of regulatory disjunction among the community of states. Public-private partnerships have been looked to as a possible vehicle for moving forward. There are examples of some cooperation models between industry and government already in practice.⁴⁷

Public Private Partnerships require the support of the interest groups, governments or organisations that rely on the space-derived data. These usually represent vested interest communities, such as the air, road and rail and maritime sectors, concerned to maintain their current international coordination and solutions for the space-related sector.⁴⁸ These are the customers. Establishing an appropriate forum to develop suitable user frameworks for such communities is a goal in itself.

OUTLOOK: OVERSEEING REGULATION FOR THE COMMERCIAL SECTOR

The regime of international space law has been adapting to new demands for increased commercial space activities over the past forty years. The

⁴⁶ See M. Gerhard, B. Schmidt-Tedd, n. 38 above.

⁴⁷ Infoterra GmbH is a German subsidiary of EADS Astrium GmbH with an exclusive ministry licence to deal in and distribute data from the high-resolution Terra-X and Terra SAR satellites. Spot Image, originally owned by France's CNES, is now part of the EADS group.

⁴⁸ One example is the International Association of Marine Aids to Navigation and Lighthouse Authorities, IALA, currently interested in developing a policy for AIS access, see <http://www.iala-aism.org/chapo/index.php> [accessed 13th September 2011].

commercial sector, as well as governments, is looking for a return on investment in outer space.⁴⁹ There has been a decline in the passing of hard law governing space activities, and with it, a clear move towards so-called soft law instruments. The UN COPUOUS continues to play an essential role in the regulatory environment, emphasising its central role at the level of international governance and setting standards. The technology drive leads to increasing demands on technical and legal interfaces, with a need for consistent and uniform interpretation at state level.

These developments are all to be welcomed for various reasons. Firstly, UNCOUOS remains the appropriate international forum for discussing legal developments in outer space; secondly, it has already expressed concern to ensure coherent development of state practice in the light of increasing commercial activities. Its recommendations, which are prepared as the basis for General Assembly Resolutions, are important contributions to the development of modern space law. Their status as 'soft' law is showing some signs of acceptance, even if by default; space activities cannot continue without adherence to such newer precautionary measures wrapped as guidelines. The Legal Subcommittee, in its preparatory work, openly addresses the hierarchical relations between states and their commercial sector, reminding states of their international duties.⁵⁰

The instruments appearing at UN COPUOUS, ITU and inter-agency level can be seen as correctives to developments across the space-oriented states. They are important regulatory contributions and guidelines for the international space-faring community. This reinforces the importance of the Legal Subcommittee as a platform for monitoring and discussing current developments.

With the commercial interests and needs of governments now aligning with those of the commercial sector, there will be more evidence of cooperation between both sectors in future space activities.⁵¹ The bifurcation of space allows the increase in downstream activities to be discussed and observed at international level. In the longer

⁴⁹ L.J. Smith, At What Price? IP-Related Thoughts on new business models for space information, *Acta Astronautica*, vol. 69, 714-721, 2011. doi:10.1016/j.actaastro.2011.04.013

⁵⁰ F. Lyall, P. Larsen, n. 1, above.

⁵¹ L. Nardon, Ch. Vennet, Development of Public-Private Partnerships in the European Satcom Sector, ifri, 2011, available at <http://www.scribd.com/doc/62073709/The-Development-of-Public-Private-Partnerships-in-the-European-Satcom-Sector>.

term, the funding of space activities will provide the greatest impact on cooperation between the public and private sector. The news that GMES funding is not secured for the longer term can only mean that both sectors, government and commerce, are likely to expand their mutual dependencies. Bifurcation may well lead to governments becoming more dependent on the commercial sector than ever before.

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