

NewSpace Persistence under Australia's Launch Regulation

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Abstract

State regulating NewSpace launch activity risk missing out on securing their place in the global market. Australia provides a useful case study when considering the significance of national space policy and the market realities in the development of domestic regulation governing launch services. When domestic regulation doesn't properly consider a policy position or the nature of the market the law can restrict the development of industry. The present paper discusses Australia's history in commercial space launch activities from a policy perspective and an operational perspective. When a state understands NewSpace activities in the context of how the domestic industry fits into the global market, a policy ambition can be developed which, in turn should feed into the creation and implementation of a domestic regulatory framework. Through this process, a state may facilitate its domestic industry to meet the global demand for innovative launch capabilities in a safe manner which complies with a state's international obligations.

Keywords: Launch, Australia, NewSpace, Regulation, Market

Acronyms/Abbreviations

AUD: Australian dollar.

NASA: National Aeronautics and Space Administration

U.S.: Unites States of America.

USD: United States dollars.

1. Introduction

In 2019 Australia implemented a revised regulatory framework concerning the launches and returns of space objects. The present paper discusses the background to this framework in illustrating the importance of a state understanding and having a policy position on NewSpace launch services prior to implementing a regulatory framework governing NewSpace launch

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activities. Part 2 below provides an overview of Australia's relevance in commercial launch activity before outlining the nature of the current regulatory framework which governs that activity. Part 3 suggests the lack of an appreciation and a policy position regarding the commercial launch market can limit a launch-capable state's opportunity to fully contribute to that market. Part 4 of the present paper summarizes the example of Australia in this context and suggests a method which states can adopt to avoid missing such opportunities.

As the present analysis is given from the perspective of industry, matters relating to government procedures and bureaucratic priorities are not considered. This forms the main limitation of the present paper. Nevertheless, the observations and insights from industry are relevant and must be considered when a government seeks to implement policy or regulation which controls activity within that industry.

The significance of this paper is brought about by identifying the weaknesses of an existing and recently developed regulatory framework governing NewSpace launch activity. Doing so demonstrates how states can ensure they facilitate industry to operate at its greatest potential and meet the growing global demand for innovative launch services in a safe and internationally compliant manner.

2. An Overview of Australia's NewSpace Launch Regulation

2.1. A Background of Australia's Space Launch Capability

Australia's heritage in launch provision began from the Woomera Test Range in South Australia in the middle of the last century.¹ Since the early 1970s, this launch capability became almost exclusive to national security purposes. By the 1990s the privatization of outer space activities, including launch services, was apparent and the Australian government sought to address this phenomenon. Through a regulatory framework established in 1998 to govern private space launch activity, Australia attempted to capture some of the then newly developed commercial launch market.² This attempt failed. The framework was never used for its primary purpose of launching private space objects from Australia.³

Today, privatization of space activities is often referred to as "NewSpace" to distinguish the initial trend of privatization in the 1990s with contemporary

1 M.J. Phillips, "How it started – Australia's early days in space at Woomera", *Australian Strategic Policy Institute* <https://www.aspistrategist.org.au/started-australias-early-days-space-woomera/> (accessed 1 October 2021).

2 See, *Space Activities Bill 1998* (Cth).

3 S. Freeland, *Analysis Report: Public Submissions into the Australian Government's Review of the Space Activities Act 1998* (Commonwealth of Australia, 2016) ("Freeland Report") 24.

non-government space activities.⁴ In the context of the present paper, NewSpace concerns the following aspects:⁵

- a) the privatization of space activities;
- b) the miniaturization and expanded capability of space-related technologies; and
- c) a greater opportunity for new actors to enter markets relating to space activities.

In 2013 NewSpace ambitions in launch activities was evident in Australia when two Australian brothers began work on developing hybrid propulsion technologies.⁶ Their manufacturing company, Gilmour Space Technologies is today based in the north east of Australia and has announced its first orbital launch to take place during 2022.

Two further Australian companies were since established in recognition of the NewSpace demand for launch capabilities. Southern Launch is a South Australian company providing a suite of services including engineering solutions and launch facilities for suborbital and orbital missions.⁷ In 2020 Southern Launch demonstrated Australia's capability to execute a series of rapid flights of civil space-capable vehicles.⁸ On the opposite end of the country, in the Northern Territory, Equatorial Launch Australia operates the Arnhem Space Centre. Equatorial Launch Australia is engaged to support a NASA suborbital campaign, which will be the first time NASA has used a commercial launch facility outside the United States.⁹

Through these types of endeavors, by 2017 the Australian industry was beginning to secure a sovereign launch capability to offer the global market. Yet, the Australia's political environment meant the country was not yet a viable option for sustainable launch services. Then, in March 2017 the

4 See, eg, G. Martin, *NewSpace: The Emerging Commercial Space Industry* (NASA Ames Research Centre, 2015); A. Rajendran et al, *Access to Space in the Southern Hemisphere* (International Space University and University of South Australia, 2020) VIII.

5 See, S. Schneider, "Newspace for Global Benefit" *Leiden Law Blog* <https://www.leidenlawblog.nl/articles/newspace-for-global-benefit> (accessed 1 October 2021).

6 *Gilmour Space* <https://www.gspacetech.com/about> (Accessed on 2 October 2021).

7 "About Us", *Southern Launch* <https://www.southernlaunch.space/about-us> (Accessed on 2 October 2021).

8 Southern Launch, "Previous Launches" *SouthernLaunch.space* <https://www.southernlaunch.space/previous-launches> (accessed 2 October 2021).

9 Commonwealth Minister for Trade, Tourism and Investment, *One giant leap for Australia's space sector* (media release, 24 September 2021) <https://www.trademinister.gov.au/minister/dan-tehan/media-release/one-giant-leap-australias-space-sector> (accessed 2 October 2021).

government proposed amending the then existing regulatory framework governing civil launch activity which was, until that point, ineffective.

2.2. Chasing the Privatization of Space Activities: the 1998 Act

Australia's first regulatory framework governing launches of civil space objects was the *Space Activities Act 1998* (Cth) (the "1998 Act"). The purpose of the 1998 Act was to "enable Australia to attract investment by commercial interests" while upholding its national interests generally and the state's obligations under the United Nations space treaties.¹⁰ Lisk and de Zwart suggest that this framework may have been doomed from the beginning just from considering the timing of its implementation, which was prior to the cubesat standard and when the space shuttle was still in use.¹¹ To, then, expect that framework as suitable for facilitating NewSpace launch activities may have been unreasonable.

By 2015 the government had announced a review in to the 1998 Act with the purpose of determining:¹²

- a) whether the framework under the 1998 Act was helping Australians tap into global supply chains; and
- b) to help ensure the space sector keeps up with the international changes and technological developments.

Part of the findings of this review included stakeholders urging the government to consider a less risk-averse approach, particularly where the unreasonable risk measures under the framework of the 1998 Act were not practiced in other jurisdictions.¹³ The overwhelming amount of feedback from the public during the review expressed a desire for the government to proactively facilitate entrepreneurship and private investment in the space sector. Additionally, almost all respondents surveyed during the review were in favor of changes being made to the 1998 Act in light of the developing space-related technology paradigm.¹⁴

10 *Explanatory Memorandum to the Space Activities Bill 1998* (Cth), 3.

11 J. Lisk and M. de Zwart, "Watch This Space: The Development of Commercial Space Law in Australia and New Zealand" (2019) *Federal Law Review* 47(3).

12 Minister for Industry, Innovation and Science, *Atmosphere is Right for a Review of Our Space Activities* (media release, 24 October 2015) <https://www.pyneonline.com.au/media-centre/media-releases/atmosphere-is-right-for-a-review-of-our-space-activities> (accessed on 2 October 2021).

13 Freeland Report, 39, 40.

14 Freeland Report 41, 42 (see also 124).

In 2017 the Australian government proposed a list of changes to the framework of the 1998 Act.¹⁵ The matters in that list remain the basis of the revised framework in force today.

2.3. The Launches and Returns Act of 2018

The government's proposed amendments to the 1998 Act sought to address the "changing landscape of the space industry" and in 2018 a bill was tabled before the Australian parliament to this effect.¹⁶ The purpose of the bill was to redirect the approach taken by the 1998 Act through:¹⁷

- a) expanding the space licensing jurisdiction to include launches from aircrafts and high power rockets not reaching outer space; and
- b) reducing barriers to participate in the space industry by streamlining approval processes and insurance requirements for launches and returns.

The main changes in the new legislation to give effect to the redirection were the:

- c) enabling for application criteria and conditions of authorizing space activities to be amended without parliamentary approval, as means to adapt to changes in more timely manner;
- d) reduction of the insurance cap on third party liability coverage required to be held by applicants from 750 million AUD to 100 million AUD (approximately from 543 million USD to 72 million USD) or to the maximum probable loss identified for the associated activity; and
- e) establishment of fees for the assessment of applications under the framework to be determined based on the government's costs associated with the assessments.

Each of these changes is evident in the final and current version of the *Space (Launches and Returns) Act 2018* (Cth) ("Launches and Returns Act"). The determination on whether this regulatory redirection would indeed reduce the barriers to participation was largely dependent on the construction of the delegated legislation sitting underneath the Launches and Returns Act. This

15 Australian Government, *Report on Space Activities Amendment (Launches and Returns) Bill 2018 [Provisions]* (Commonwealth of Australia) ch 1, available at https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/SpaceActivitiesBill18/Report.

16 *Space Activities Amendment (Launches and Returns) Bill 2018* (Cth).

17 *Explanatory Memorandum to Space Activities Amendment (Launches and Returns) Bill 2018* (Commonwealth of Australia, 2018).

series of delegated legislation addresses the application requirements which must be met by applicants seeking to carry out activities under the framework.

2.4. The General Rules

After the Launches and Returns Act was passed by parliament, the government commenced a public consultation on the draft versions of the delegated legislation, which consisted of three instruments. The instrument concerned in the present discussion is what became the *Space (Launches and Returns) (General) Rules 2019* (Cth) (“General Rules”). The object of the General Rules is “to provide clear information and a streamlined process relevant to the approval of an activity under the Act”.¹⁸ The General Rules attempts to achieve its object by providing information on the application criteria relating to five authorization types, including an Australian launch permit which allows persons to operate a launch vehicle intending to reach 100 kilometers or more above sea level.¹⁹

The public submissions in response to the draft version of the General Rules raised a set of common concerns as to the practical implications of the application requirements proposed therein. Many submissions provided to the government identified issues with safety, the apportioning of liability and the procedures for assessing risk.²⁰

The consultation on the General Rules, closed in June 2019. Less than three months later the final versions came into force with the content remaining almost unchanged from that in the drafts. The government provided no public response to the concerns raised by the stakeholders’ submissions and the submissions themselves were not made available to the public until over a year later.

Despite stakeholder concerns remaining in the General Rules, the revised framework in full has seen two authorizations being granted to an Australian company to operate a launch facility and one authorization granted to a foreign launch provider to launch a space object.²¹ This is a positive sign that the revised framework is workable. At the same time, industry has indicated

18 *Explanatory Statement on the Space (Launches and Returns) (General) Rules 2019* (Commonwealth of Australia, 2018) 1.

19 General Rules, Pt 3, Div 3.

20 See, Department of Industry, Science, Energy and Resources (ed), *Published Responses to the Space (Launches and Returns) Act 2018: consultation on draft rules* <https://consult.industry.gov.au/space-launches-and-returns-act-2018/submissions/list> (accessed on 2 October 2021).

21 Department of Industry, Science, Energy and Resources, “Notice of Minister’s Decision about Space Activities”, *Industry.gov.au* <https://www.industry.gov.au/regulations-and-standards/regulating-australian-space-activities/notice-of-minister-decisions-about-space-activities> (accessed on 3 October 2021).

it is operationally prepared for further activities which aren't yet authorized.²² While the framework is proven to enable the approval of commercial space launch activities, industry nevertheless experiences challenges as those identified by stakeholders in the years prior to the revised framework coming in force. Though it is outside the scope of the present discussion to analyze the challenges of the Launches and Returns Act, examples of some include the procedure for assessing risk for a launch activity,²³ the fees relating to assessing applications for approving a launch activity²⁴ and the lack of compatibility or resemblance of the Australian framework with that of other commercial launch jurisdictions.²⁵

The aim of the framework under the Launches and Returns Act was to better facilitate commercial launch operations which, under the previous framework, had not occurred. The revised framework brought welcomed improvements. However, the few weaknesses which remain in the current regulatory framework have contributed to Australia's delay in securing a sustainable sovereign commercial launch capability.

22 *Public Hearing: 10 March 2021 on the Senate Inquiry into Developing Australia's Space Industry* (Parliament of Australia, 2021) available at <https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22commmittees%2Fcommrep%2F937f4569-3e36-46f8-8d69-6cc9d30376da%2F0000%22>.

23 General Rules, ss 52, 98.

24 Australian Space Agency, *Draft cost recovery implementation statement* (Australian Government, 2018); Department of Industry, Science, Energy and Resources, "Partial cost recovery for launch and return applications" *Industry.gov.au* (21 January 2020) <https://www.industry.gov.au/news/partial-cost-recovery-for-launch-and-return-applications>.

25 Space Industry Association of Australia, *Submission from Space Industry of Australia to Senate Economics Legislation Committee* (13 July 2018) 9, available at https://www.spaceindustry.com.au/siaa_senate_submission_final/; M. Clark et al, *Review of Australia's Space Industry Capability* (March 2018), 82 available at https://www.spaceindustry.com.au/wp-content/uploads/2019/04/review_of_australias_space_industry_capability_-_report_from_the_expert_reference_group.pdf; Australian Labor Party, *Additional Comments to Senate Economics Legislation Committee on the Inquiry into the provisions of the Space Activities Amendment (Launches and Returns) Bill 2018* (Canberra, 2018) 27, 29; Civil Aviation Safety Authority, *Feedback to Consequential amendments to Subpart 101.H - Rockets - (CD 1920SS)* <https://consultation.casa.gov.au/regulatory-program/cd-1920ss/> (accessed on 2 October 2021); Department of Industry, Science, Energy and Resources, "Australian Space Agency - Draft cost recovery implementation statement" *consultation hub of the Department of Industry, Science, Energy and Resources* <https://consult.industry.gov.au/australian-space-agency-draft-cost-recovery-implementation-statement> (accessed on 3 October 2021). But see, generally, General Rules, ss 19(2), 48(2).

3. Australian Space Policy in the Context of NewSpace Launch Activity and NewSpace Launch Regulation

3.1. A (Lack of Any) History of Commercial Launch Policy in Australia

The decreased amount of civil launch activity at the Woomera Test Range from the 1970s did not otherwise remove Australia's involvement in international space activities.²⁶ During the 1980s the government established a national space science research and applications office as well as commissioned a report into whether a space domestic industry should be supported by the government. The report was released in 1985 and is referred to as the Madigan Report. It recommended a national policy be established with urgency but made no mention on the policy considering Australia's opportunities in civil launch capability.²⁷

Despite interests from the late 1980s by various parties to establish a launch facility in Australia, government support for any civil launch capability neither appeared in national space policies nor in any national industry policy. When a U.S launch company expressed willingness to set up operations from the Woomera Test Range, the Australian government chose to try and secure such activity occurring from Australia through enacting domestic regulation of launch activities.²⁸ Yet, this framework, the 1998 Act was implemented without any national policy ambition for Australia's role in the global launch market.

In 2011 Australia did form a policy position on civil launch activities. That position was that launch activities were not an important factor in the domestic space economy and the government would give limited support to commercial launch providers operating from Australia.²⁹ This policy position may be a large reason why the 1998 Act failed to secure any private launch operations in Australia. Australia had implemented a regulatory framework

26 K. Dougherty, "Sixty Years of Australia in Space" (2020) 153(I) *Journal and Proceedings of the Royal Society of New South Wales* 46, 53.

27 See, R. Madigan et al, *A Space Policy for Australia* (Australian Academy of Technological Sciences, 1985).

28 See, M. de Zwart, "No launch from Australia: something missing from our plans for the new space race," *The Conversation* (11 June 2018) <https://theconversation.com/no-launch-from-australia-something-missing-from-our-plans-for-the-new-space-race-97924> (accessed on 3 October 2021); M. James, "Australia in Orbit: Space Policy and Programs", *Current Issues Brief: 6 April 1998* (Parliament of Australia, 1998). https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/CIB/CIB97_98/98cib12 (accessed 3 October 2021); *Space Activities Amendment (Bilateral Agreement) Act 2001* (Cth).

29 Australian Government, *Principles for a National Space Industry Policy* (Commonwealth of Australia, 2011), 4, 5; See also, Department of Industry, Innovation, Science, Research and Tertiary Education, *Australia's Satellite Utilisation Policy* (Commonwealth of Australia, 2013), 2, 7, 11.

without the appreciation or ambition of meaningfully engaging in the global space market through launch provision.

3.2. The Australian Trend of Regulating Launch Activity Before Developing a Policy on Launch Activity

By 2015 the government considered whether Australia could better facilitate a commercial launch industry. Its first order of business was a review into the 1998 Act which supported the occurrence of three important milestones in Australia's governance of NewSpace launch activity:

- a) the drafting of a revised framework governing space launches, which began in March 2017 and what became the Launches and Returns Act);
- b) the commission of an expert review into Australia's space capabilities, announced in July 2017, which considered the market in a NewSpace context; and
- c) an announcement in September 2017 that a national space office will be established, which led to the Australian Space Agency.

The final report of the expert review into Australia's space capabilities was completed in 2018, shortly before the Australian Space Agency commenced operations. The report recommended the government better facilitate launch activities from Australia to which the government responded it would support only in principle, noting it had already reviewed the 1998 Act.³⁰

On 1 July 2018 the Australian Space Agency commenced operations with the purpose to "transform and grow a globally respected Australian space industry that lifts the broader economy" and inspires and improves the lives of Australians.³¹ Less than two months later, in August 2018, the parliament passed the Launches and Returns Act which aims to balance the encouragement of industry participation, innovation and entrepreneurship on the one side with the safety of space activities on the other.³²

Accordingly, by September 2018, Australia had no less than three operating commercial launch services providers,³³ a public office dedicated to space affairs and a revised legislative instrument governing commercial launch activities. Yet, in similar vein to the circumstances following the 1998 Act, all

30 Australian Government, *Australian Government Response to the Review of Australia's Space Industry Capability* (Australian Government, 2018), 7. See also, M. Clark et al, *Review of Australia's Space Industry Capability* (March 2018) available at https://www.spaceindustry.com.au/wp-content/uploads/2019/04/review_of_australias_space_industry_capability_-_report_from_the_expert_reference_group.pdf.

31 Australian Space Agency, *Australian Space Agency Charter* (Australian Government, 2018).

32 Launches and Returns Act, s 3

33 See Part 2.1 above.

this was in the absence of any prescribed national policy position which even mentioned the civil launch activities.

3.3. Advancing Space: The Policy Position on Launch

The Australian Civil Space Strategy (“Advancing Space”) was released in April 2019 to inform the Australian Space Agency’s operations.³⁴ Advancing Space determines the nation’s space ambitions which include increasing domestic capabilities and promoting a globally respected space culture. To substantiate these ambitions, the policy lists seven national space priority areas. *Access to space* is the last-listed priority area, the subtext of which reads:³⁵

There are emerging opportunities for Australia to leverage international space missions and commercial launch activities from Australian territory to support industry growth. Protecting national safety and meeting our international obligations will be critical before domestic launch can occur.

While, Advancing Space does not state the government will directly facilitate the development of a domestic launch industry, the policy does identify new launch vehicle technologies as an opportunity for Australia under a second priority area of *leapfrog and research and development*. This is significant because this priority area is an important part of NewSpace launch market and, should developers of rocket technologies seek the technologies be flight tested from Australia, the activities would fall under the jurisdiction of the revised regulatory framework.

Advancing Space also includes a metric on which the government may monitor the development of a domestic launch industry. One of the measures of success the policy sets out is, by the year 2029, for Australia to have achieved the creation of “a regulatory framework that ensures effective, efficient and safe space activities”. Thus, Advancing Space saw Australia with a policy which recognizes civil launch capability can contribute to the domestic economy.

3.4. Lessons From Australia’s Experience in Entering the Newspace Launch Market

The 1998 Act was legislated without any definitive policy ambitions on Australia’s development of a domestic launch industry. From 2011 until 2019, Australia’s limited policy position on its civil launch ambitions was directly contrary to the development of a sustainable commercial launch industry. In 2018 the government had introduced to the federal parliament

34 Australian Space Agency, *Australian Civil Space Strategy 2019-2029* (Commonwealth of Australia, 2019).

35 Australian Space Agency, *Australian Civil Space Strategy 2019-2029* (Commonwealth of Australia, 2019) 13.

the draft of what would become the Launches and Returns Act. Soon after the parliamentary readings of the draft began, the government established the Australian Space Agency. As neither the revised regulatory framework nor the new national space office was created under the guidance of any prescribed policy position on space activities, the government's commercial launch initiatives had, as in the late 1990's, tried to run before they had even stood up, so to speak.

The 2019 policy document *Advancing Space* gives the government some direction when it comes to considering the opportunities of Australia's role in commercial launch market. Were a policy position on commercial launch activity to have been decided upon prior to the drafting of the revised space launch framework, perhaps government may have been more informed on the dynamics of the NewSpace launch market before creating the laws which regulate it on the domestic level.

Considering complementary mechanisms alongside, or prior to, developing a regulatory framework may also promote industry growth once the regulation is in force.³⁶

The lesson from Australia's approach to space regulation and space policy regarding commercial launch activities is not ideal one for a state or its industry to experience. Where regulation follows policy, rather than vice versa, the frameworks implemented by states are more capable to speak to the national ambitions. This method may also see provisions within a framework carry less risk of leading to unintended adverse consequences. By legislators reviewing the content of the framework in the context of industry realities and policy priorities, effective drafting may take place to see that no aspect of the legislation runs against industry interests or allows circumstances to arise which are contrary to policy objectives. Fortunately, Australia is passed the worst of this journey. The government has acknowledged many of these weakness in its regulatory framework and is now working to resolve them.

4. Solutions for Newspace Facilitation: A Way Forward

4.1. Identifying Immediate Flaws Enables Greater Long Term Strength

The reason the present paper reflects upon the disadvantages of Australia's regulation for commercial launch activities is to allow an analysis of the nature of these disadvantages. Considering the weaknesses of a regulatory framework informs stakeholders of the reality under which their industry is

³⁶ See, eg, *Public Hearing: 10 March 2021 on the Senate Inquiry into Developing Australia's Space Industry* (Parliament of Australia, 2021) available at <https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22committee%2Fcommrep%2F937f4569-3e36-46f8-8d69-6cc9d30376da%2F0000%22>.

operating and, more importantly, informs a government of where effort may be directed to ensure a framework better facilitates the industry it regulates. In Australia's case, extensive public comment on the dynamics of NewSpace, including launch activities, is available for ready access by the government due to the various consultations and inquiries related to space which the government made along its journey. This makes it relatively easy for Australia to remedy the flaws in its regulation compared to a state going through a similar experience without immediate access to extensive public and expert commentary on its domestic capabilities, the relevant market or its legal frameworks.

Promoting only the well-established aspects of a national position, or only the achievements already held by the domestic industry, does little to progress wider industry growth. By highlighting, and then eroding, the disadvantages in its commercial launch regulatory framework, Australia may truly harness the comparative and competitive strengths held in its NewSpace launch capability to enable that industry to be one of the achievements.

4.2. Reviewing the Journey and Moving Ahead

Australia's NewSpace launch capability includes several private companies offering launch services which are in demand from the global market. Paired with Australia's favorable weather conditions, near vacant airspace, maritime space and landmass, and its relative political and economic stability, the regulatory environment is the last piece of the puzzle before Australia may become the global leader in NewSpace launch activities. Part 3 of the present paper explored the haphazard approach Australia took when responding to commercial interest for launch activities around the time of the turn of the millennium. Upon a comprehensive review of its initial but failed regulatory framework of 1998, the government, in 2018, created a revised framework. The approach of this revised framework still left many concerns under the previous 1998 Act unaddressed. The revised framework has also brought in new challenges, some of which were discussed in part 4. Were such weaknesses resolved, Australia's launch industry would be on an almost unstoppable trajectory to delivering on the demand sought by the global and domestic NewSpace market.

Part 5 of the paper suggested these weaknesses in the regulatory framework are caused by a mismatch in both the timing and content of policy direction and regulatory reality. This imbalance was sustained because the government addressed few of the concerns raised, and recommendations made, by the stakeholders regarding both the old and revised frameworks and because the government seemed to not fully understand the nature of the market relating to NewSpace launch services when developing national policy and regulatory framework on the matter.

The main lesson made available by the Australian journey is for states to ensure that, for any industry it seeks to regulate, a defined position and an

accompanying strategy under a policy must precede the regulatory framework itself. Moreover, before a policy is determined, the government must understand the domestic industry's capability and the market within which that industry operates. This is the only sure winning formula for bringing regulatory oversight into a workable cohesion with national ambition and industry opportunities.

4.3. Closing Remarks

States must avoid top down and shock reactive regulatory measures when seeking to address an opportunity in commercial space activity. The opportunity to lead the global market for NewSpace launch services is no exception. The context behind Australia's Launches and Returns Act is a story of encountering the right opportunity with the wrong reception. Australia's civil launch heritage, natural advantages for launch activity and the largely pro-business attitude meant it was only a matter of time before the launch market would eventually direct the federal government's attention to try again to develop a commercial space launch industry.

If a state has decided to regulate commercial launch activity, the lesson learned from Australia's experience in this journey is to adhere to the following ordered process:

- a) understand the domestic capabilities and the market within which those capabilities operate;
- b) develop an informed policy position regarding the industry and that market; and
- c) consider the information developed in addressing steps a) and b) above when creating a regulatory framework to facilitate industry meeting the policy ambitions.

In Australia's case, the framework under the Launches and Returns Act came into force prior to a policy position on commercial launch activity, thus rotating the positions of step b) and step c) with one another. Moreover, it is not clear the Australian government truly understood the NewSpace market or its own commercial launch capabilities when it created the revised regulatory framework. Thus, step a) is not evident in Australia's story.

As a consequence of falling short of this three-step process, Australia's current regulatory framework governing commercial launch activity demands improvement. However, for the first time in the country's history, a launch policy position, a regulatory framework governing launches and an active launch industry are operating simultaneously. The adaptable nature of the General Rules which govern the application criteria for the launches and returns of space objects in Australia allow the government flexibility should it decide to revise certain provisions of its regulatory framework. Doing so in a timely and considered manner (as opposed to in shock reaction without

addressing stakeholder concerns) to realities of the market will better support the growth of Australia's NewSpace launch industry. What follows is the ability for Australian launch service providers to better deliver on the demand of actors in the launch and satellite industries worldwide. This will be a significant and long overdue step towards securing advanced and affordable space activities which, ultimately, better facilitate the delivery of the benefit to the end users derived from space activities.