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Page 3: Submitter Information

Q1

Personal Information

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Q2**No**

Are you making this submission on behalf of a business or organisation?

Q3**Yes**

Would you like to be kept informed of the outcome of the Space Policy Review?

Q4**Yes**

Are you happy for MBIE to contact you if we have questions about your submission?

Q5**Respondent skipped this question**

Privacy

Q6

Release of Information

I understand that if there is other information in this submission that I do not wish to be released, I will email this to spacepolicyreview@mbie.govt.nz with the subject line "Release of information", together with my reasons for withholding the information and grounds under the Official Information Act 1982, for consideration by MBIE

Page 4: New Zealand's interests in space

Q7 **Academic involvement on space issues**

What are your interests and relationship to space? Pick as many as apply below:

Q8
Please note any other interests and relationship to space below that you would like to share.

I am one of the most heavily cited academics on space tourism. I was formerly at the University of Canterbury and University of Otago. I am currently a visiting professor at the University of Montana, USA.

Page 5: New Zealand's values in space

Q9
To what extent do you agree or disagree that these values should apply to New Zealand's space activities and engagements?

Innovation	Strongly agree
Responsibility	Strongly agree
Stewardship	Strongly agree
Partnership	Strongly agree

Q10 **Respondent skipped this question**

Are there any other values, or aspects of kaitiakitanga (guardianship), that you think should apply to New Zealand's space activities and engagements? For example, cultural values regarding space.

Page 6: New Zealand's space policy objectives

Q11
Rank these key policy objectives in order of importance to you: Click and drag to reorder the objectives from 1 (most important) to 5 (least important)

Growing an innovative and inclusive space sector	4
Modelling sustainable space and Earth environments	3
Promoting the responsible uses of space internationally	2
Protecting and advancing our national security and economic interests	5
Regulating to ensure space activities are safe and secure	1

Page 7: Growing an innovative and inclusive space sector

Q12

To what extent do you agree or disagree that these policy objectives will help the New Zealand government to grow an innovative and inclusive space sector?

Promoting New Zealand's natural advantage for conducting space activities, and research and development expertise across the space value chain **Agree**

Partnering within New Zealand and internationally to increase research and development capabilities **Agree**

Identifying opportunities to increase diversity in the space sector **Agree**

Using cutting-edge space technology and space sourced data to support New Zealand's values and interests **Agree**

Q13

Do you have any comments on these policy objectives? (e.g. any suggested change to how they are framed? Is there anything missing?)

New Zealand's natural advantages as a launch state (comparative lack of aerospace traffic and availability of low-population-density regions from which to launch) could be emphasised.

Q14

Are there any other policy objectives that you think would help the New Zealand government to grow an innovative and inclusive space sector?

Having targets for how Maori will actually benefit is important here. As shown by Rocket Lab to date, most careers in this field (particularly higher paid ones) will not contribute heavily to development in the regions but will instead be focused on major cities, potentially not even in New Zealand. Rocket Lab's submission to the Wairoa district council discussed how their Mahia launch site would contribute to regional development, but it is unclear if most of those benefits have come to fruition. The company does not encourage tourism to the region (though some tourists do travel to watch launches), and the majority of Rocket Lab jobs appear to be located in Auckland and overseas. Benefits for Māori, which were also discussed in the submission to Wairoa council, seem particularly meagre.

Q15

Respondent skipped this question

Do you have any questions or comments about what these objectives would mean in practice?

Q16

To what extent do you agree or disagree that these policy objectives will help the New Zealand government to promote the responsible uses of space internationally?

Advocating for effective international rules, norms and standards in space **Strongly agree**

Partnering with like-minded launch states to adopt peaceful, responsible and sustainable space practices **Strongly agree**

Collaborating internationally to increase New Zealand's influence and capabilities in the global space sector **Strongly agree**

Q17

Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed? Is there anything missing?)

The Outer Space Treaty of 1967 is clearly lacking, as it was written during a time when very few launches were occurring and the private sector was not directly involved in launches. Unnecessary 'PR stunt' launches like Rocket Lab's Humanity Star and SpaceX's Tesla indicate the need for more comprehensive legal frameworks. There are no laws protecting space heritage sites. The United States has taken things further by creating a 'Space Force' branch of the military and passing legislation that allows private companies unfettered access to space and the resources residing there (the U.S. Commercial Space Launch Competitiveness Act of 2015). This legislation explicitly aims to "Promote the right of United States citizens to engage in commercial exploration for and commercial recovery of space resources free from harmful interference." As the legal framework will lay the foundation for activities over the coming decades and dictate the manner in which the private sector develops, it is important to consider the long-term implications of the current laissez-faire approach.

Q18

Are there any other policy objectives that you think would help the New Zealand government to promote the responsible uses of space internationally?

The emissions caused by each launch should be required to be evaluated and published. Greater public transparency regarding what Rocket Lab is actually launching (e.g. for the US government) should be required.

Q19

Respondent skipped this question

Do you have any questions or comments about what these objectives would mean in practice?

Q20

To what extent do you agree or disagree that these policy objectives will help the New Zealand government to protect and advance our national security and economic interests?

Use space assets to protect and advance New Zealand's national security and economic interests

Neither agree nor disagree

Manage the broad range of security risks in space to protect New Zealand's space industry

Neither agree nor disagree

Collaborate with international space and security partners to pursue New Zealand's national security and economic interests

Agree

Q21

Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed? Is there anything missing?)

Militarization and surveillance need to be considered here. What laws, regulations, and policies are in place to ensure the peaceful use of outer space?

Q22

Are there any other policy objectives that you think would help the New Zealand government to protect and advance our national security and economic interests?

Great transparency should be required in terms of what private companies like Rocket Lab are allowed to launch, especially when launching for foreign governments.

Q23

Respondent skipped this question

Do you have any questions or comments about what these objectives would mean in practice?

Q24

To what extent do you agree or disagree that these policy objectives will help the New Zealand government to model sustainable space and Earth environments?

Encouraging inclusive, sustainable space collaborations within New Zealand **Agree**

Assessing the cumulative impact of space activities on the Earth environment **Strongly agree**

Assisting with solving sustainability challenges through space data, including to better monitor or understand the Earth's environment **Agree**

Investing in New Zealand's capability to retain, grow, access and use sustainable space technologies **Agree**

Q25

Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed? Is there anything missing?)

The climate change implications associated with spacecraft launches are currently not well understood. Encouraging Aotearoa's development as a launch state may run counter to carbon neutrality goals. Further studies are required to tabulate and forecast emissions associated with the activities of companies such as Rocket Lab.

Q26

Are there any other policy objectives that you think would help the New Zealand government to model sustainable space and Earth environments?

The climate implications of launches need to be more fully understood, and companies such as Rocket Lab should be required to publish their emissions data. Government should consider caps or mandatory carbon offsets for such companies. NZ is endeavoring to go carbon neutral but then simultaneously encouraging the development of a space sector with unknown implications for climate change.

Q27

Respondent skipped this question

Do you have any questions or comments about what these objectives would mean in practice?

Q28

To what extent do you agree or disagree that these policy objectives will help the New Zealand government to promote the responsible uses of space internationally?

Facilitating the safe and secure use of emerging space technologies from New Zealand **Agree**

Clarifying what New Zealand space activities are inconsistent with the national interest **Strongly agree**

Promoting and protecting New Zealand's interests through permitting space technologies **Agree**

Q29

Do you have any comments on these policy objectives (e.g. any suggested change to how they are framed? Is there anything missing?)

While it is likely in NZ's national interests to develop a space sector, it is essential to clarify what this sector should look like. For instance, climate-intensive and unnecessary launches (such as the Humanity Star) and spy satellite launches for the US government do not appear to be in NZ's national interest. There needs to be further clarity regarding what private companies are allowed to do in this emerging area.

Q30

Are there any other policy objectives that you think would help the New Zealand government to ensure space activities are safe and secure?

An international treaty or regulatory framework on space debris is likely needed, or will be needed soon given the projected increase in launch rates.

Q31

Respondent skipped this question

Do you have any questions or comments about what these objectives would mean in practice?

Page 12: Regulating in line with our national interests

Q32

Are there any comments you would like to make about these criteria that inform consideration of the national interest?

Unnecessary PR-style launches should be deemed as not within NZ's national interests. Further, it is unclear how the climate implications of launches factors in here. The wording states that launches 'likely to cause serious or irreversible harm to the environment' are not in our national interest. Yet all launches will do that, via their contribution to climate change. Specific requirements (such as mandatory carbon offsets or emissions caps) needed to be put in place, rather than vague language about sustainability. The onus should be placed on companies to monitor and report their emissions data.

Q33

Respondent skipped this question

What questions do you have about how the national interest is considered in practice?
