



PROACTIVE RELEASE COVERSHEET

Minister	Hon Simon Watts, Hon Nicola Grigg, Hon Penny Simmonds	Portfolio	Minister of Climate Change and Minister for the Environment
Name of package	Proactive release of Marine Carbon Dioxide Removal	Date to be published	1 October 2026

List of documents that have been proactively released

Date	Title	Author
24 June 2026	26-BRF-01120 Advice on Gigablue	Ministry for the Environment
9 April 2026	26-BRF-00851 CPMG Minutes March 2026	Ministry for the Environment
25 March 2026	26-BRF-00671 Meeting with Gigablue on Wednesday 25 March 2026	Ministry for the Environment
05 March 2026	26-BRF-00478 Meeting to Discuss Matters Across the Environment and Climate Change Portfolios (excerpt)	Ministry for the Environment
19 December 2025	25-BRF-00199 Marine Carbon Dioxide Removal	Ministry for the Environment

Information redacted **YES**

Any information redacted in this document is redacted in accordance with the Ministry for Cities, Environment, Regions and Transport policy on proactive release and is labelled with the reason for redaction. This may include information that would be redacted if this information was requested under Official Information Act 1982. Where this is the case, the reasons for withholding information are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Summary of reasons for redaction

Some information has been withheld under the following Official Information Act clauses;

- 9(2)(a) protect the privacy of natural persons, including that of deceased natural persons
- 9(2)(b)(ii) to protect information where the making available of the information would likely unreasonably prejudice the commercial position of the person who supplied or who is the subject of the information.
- 9(2)(h) - to maintain legal professional privilege
- 9(2)(j) – to enable a Minister of the Crown, department, organisation, or local authority to carry on, without prejudice or disadvantage negotiations (including commercial and industrial negotiations).
- 9(2)(g)(i) – to maintain the effective conduct of public affairs through the free and frank expression of opinions by or between Ministers, members of organisations or officials in the course of their duty.



BRIEFING

Advice on Gigablue

Date:	24 June 2026	Priority:	Routine
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-01120

	Action sought	Response by
Hon Simon Watts; Hon Nicola Grigg Minister of Climate Change; Minister for the Environment	Agree officials maintain a watching brief on marine carbon dioxide removals Agree to forward this briefing	N/A
Rt Hon Winston Peters; Hon Mark Patterson Minister of Foreign Affairs; Associate Minister for Regional Development	Forward for your information	N/A

Action for Minister's Office staff

Forward to relevant Ministers if agreed.

Appendices and attachments

Appendix 1: Gigablue timeline

Appendix 2 withheld in full under section 9(2)(h) of the Act

Appendix 2: 9(2)(h)

Appendix 3: 9(2)(h)

Contact for telephone discussion (if required)

Name	Position	Telephone	1st contact
Jo Gascoigne	General Manager	027 531 7202	
David Falconer	Acting Manager	9(2)(a)	✓
Matt Adams	Author		

The following departments/agencies have been consulted

Department of Conservation, Ministry for Foreign Affairs and Trade, Ministry for Primary Industries, Environmental Protection Authority

Minister's office to complete:

☐ Approved

☐ Declined

☐ Noted

☐ Needs change

☐ Seen

☐ Overtaken by Events

☐ See Minister's Notes

☐ Withdrawn

Minister's Comments



BRIEFING

Advice on Gigablue

Date:	24 June 2026	Priority:	Routine
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-01120

Purpose

1. This briefing responds to a request from Ministers for information on Gigablue's regulatory proposals and the barriers to their Microalgae Carbon Fixation and Sinking technology.

Key points

2. Ministers asked for information on a technology being developed by Gigablue called Microalgae Carbon Fixation and Sinking (MCFS). MCFS is designed to remove carbon from the atmosphere and sequester it on the seabed. Gigablue has proposed regulatory changes to better enable this technology.
3. As yet, Gigablue has not demonstrated that they can effectively remove carbon dioxide from the atmosphere and sequester it and has not been able to address concerns about environmental effects. Officials have been provided with limited information about Gigablue's methodology and research. There is also uncertainty about the manner and scale of Gigablue's proposal, as this has varied for each proposal submitted to the Environmental Protection Authority by Gigablue.
4. Carbon removed using MCFS cannot contribute to New Zealand's first Nationally Determined Contribution (NDC) for the period to 2030. This is because there is no internationally agreed methodology and insufficient evidence of effectiveness to enable the development of methods for counting marine carbon removals. If sufficient evidence were developed and sufficient progress is made at international climate negotiations, future NDCs could include MCFS.
5. 9(2)(h)
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
6. Ocean fertilisation poses potentially long-term, severe, and widespread environmental risks. Identified effects include harmful algal blooms, oxygen depletion, altered food webs, and nutrient depletion, which could significantly impact New Zealand's fisheries. It remains unclear how these risks apply to Gigablue's MCFS technology.

7. The EEZ Act has statutory requirements for the quality of information used to support the Minister when making or amending regulations. There is insufficient evidence to support Gigablue's requested regulatory changes. 9(2)(h) [REDACTED]
[REDACTED] This could undermine the integrity of New Zealand's voluntary carbon markets if credits lack environmental integrity 9(2)(h) [REDACTED]
[REDACTED]
8. At this stage, officials do not recommend making regulatory change to enable the activity and recommend Ministers do not respond to Gigablue's request for regulatory change. Officials recommend that we maintain a watching brief on Gigablue and international developments relating to marine carbon dioxide removals. Officials recommend that you forward this briefing to the Minister of Foreign Affairs, Rt Hon Winston Peters, and the Associate Minister for Regional Development, Hon Mark Patterson.
9. We will keep you informed of any developments related to Gigablue 9(2)(h) [REDACTED] as it relates to marine carbon dioxide removal technology.

Recommended action

The Ministry for the Environment recommends that you:

1. **Note** that any carbon removals from Gigablue's Microalgae Carbon Fixation and Sinking technology cannot contribute to meeting our 2030 Nationally Determined Contribution *Noted*

2. **Agree** officials maintain a watching brief over marine carbon dioxide removal technology and to continue to engage in international discussions *Agree / Disagree*

3. **Agree** to forward this briefing on to the Minister of Foreign Affairs, Rt Hon Winston Peters, and the Associate Minister for Regional Development, Hon Mark Patterson. *Agree / Disagree*



Jo Gascoigne
General Manager
 RMA Operations, Ministry for the Environment

23 / 06 / 2026

Hon Simon Watts
Minister of Climate Change

___ / ___ / 2026

Hon Nicola Grigg
Minister for the Environment

___ / ___ / 2026

Background

1. Gigablue Aotearoa South Pacific Ltd is developing a marine carbon dioxide removal technology called Microalgae Carbon Fixation and Sinking (MCFS) [26-BRF-00671 refers].¹ Marine carbon dioxide removals are a wide range of carbon dioxide removal technologies that rely on the ocean to sequester carbon dioxide [refer to 25-BRF-00199 for further information].
2. MCFS involves placing small, manufactured capsules filled with minerals (such as iron oxides) in the ocean to promote the growth of phytoplankton (microscopic, plant-like organisms). The capsules are designed to capture this phytoplankton and eventually sink to the deep sea. This process is designed to sequester carbon dioxide from sea water, to be replaced with carbon dioxide absorbed from the atmosphere.
3. Gigablue has undertaken three small scale research trials off the eastern Canterbury coast. These were treated as permitted activities under the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Permitted Activities) Regulations 2013 (Permitted Activity Regulations), and further trials are planned. To date, officials have not seen the research results and these have not been made publicly available.
4. Concerns were raised about these trials and their consistency with the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972* (London Protocol)² at the 2025 London Protocol Meeting of Contracting Parties. New Zealand committed to inform future meetings of any relevant decisions made by the Environment Protection Authority.
5. Minister Watts (Minister of Climate Change) and Minister Simmonds (formerly Minister for the Environment) met with Gigablue in March 2026. At this meeting, Gigablue proposed regulatory amendments to better enable its research and planned commercial activities. A timeline of Gigablue's activities can be found in **Appendix 1**. As a result, Ministers requested information on these proposals and on the barriers to MCFS.
6. Previously, Ministers decided officials should maintain a watching brief on marine carbon dioxide removals.

We do not recommend enabling MCFS at this time

The effectiveness and effects of MCFS are yet to be proven

7. Gigablue began engaging with officials from the Ministry for the Environment in February 2025. They have also engaged with the Ministry for Foreign Affairs and Trade

¹ Gigablue has also referred to MCFS as *Marine Carbon Fixation and Sequestration*. We understand this is an interchangeable term for the same technology.

² This is the key international agreement governing dumping and incineration at sea (including ocean fertilisation activities).

and the Environmental Protection Authority. Officials have been provided with limited information about Gigablue's methodology and research.

8. Officials consider MCFS is likely a form of ocean fertilisation ("any activity undertaken by humans with the principal intent of stimulating primary productivity in the oceans"³). This is because the MCFS capsules contain iron and manganese oxides that are intended to stimulate the growth of phytoplankton (ie, a form of primary productivity).
9. Some of the environmental risks relating to ocean fertilisation activities include effects that could be long-lasting, severe, and widespread. Potential effects identified by the international scientific community include harmful algal blooms, oxygen depletion, altered marine food webs, and nutrient depletion. These could have a significant impact on New Zealand's fisheries resources. The extent to which these risks apply to Gigablue's novel MCFS technology remains unclear.
10. Officials have not seen any evidence that:
 - a. MCFS can sequester carbon dioxide from the atmosphere for any period of time
 - b. MCFS capsules can capture phytoplankton and carry it to the seabed
 - c. MCFS does not result in deleterious environmental effects
 - d. monitoring and verification of carbon dioxide sequestered by MCFS is possible.
11. There is widespread consensus among the international scientific community that marine carbon dioxide removal techniques, including MCFS, are not ready for large scale application. This is based on the effectiveness of such technologies not being proven, limited knowledge of the marine carbon cycle, and concern about the potential for significant adverse environmental effects.

There is currently no pathway to count removals towards NDCs

12. We understand that Ministers are interested in whether carbon dioxide sequestered by MCFS could be counted towards New Zealand's Nationally Determined Contributions (NDCs) under the Paris Agreement.
13. The marine environment is a contentious area in international climate negotiations. Progress to date has only been made on including land-based removal activities (including coastal wetlands). This reflects several key constraints associated with marine activities that occur beyond the coastal zone:
 - a. There are no internationally agreed methodologies for estimating emissions and removals from marine activities, or for tracking them over time.
 - b. The scientific evidence base is currently insufficient to demonstrate the effectiveness of such activities in achieving permanent atmospheric carbon dioxide removal and storage.

³ As defined under the 2013 amendment to the London Protocol. Ocean fertilisation does not include conventional aquaculture, mariculture, or artificial reefs.

- c. There is limited understanding of whether, and to what extent, any of the carbon stored would remain within a country's national territory or jurisdiction, or what would happen if the stored carbon transferred into another country's jurisdiction.
- 14. As a result, there is currently no viable pathway to include activities such as MCFS in national greenhouse gas inventories,⁴ or in New Zealand's NDC accounting, which is based on the emissions and removals reported in New Zealand's Greenhouse Gas Inventory.
- 15. 9(2)(j) [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
- 16. 9(2)(j) [REDACTED]
[REDACTED]
[REDACTED]

Before new methods get included in our NDC, they should be assessed through the Carbon Removals Assessment Framework

- 17. Last year, Cabinet agreed to the publication and implementation of the Assessment Framework for Carbon Removals (Assessment Framework) [CAB-25-MIN-0324 refers]. This went live for applications on 13 May 2026.
- 18. The development of the Assessment Framework was a key action in the second Emissions Reduction Plan. It delivers on the National and New Zealand First Coalition Agreement commitment to progress work to recognise additional forms of carbon removals in the emissions trading scheme or other mechanisms.
- 19. The Assessment Framework aims to encourage a wide range of carbon removal activities by establishing a process to expand the scientific understanding of carbon removal activities that may be conducted in New Zealand. It provides a transparent, science-based process that the Government will follow when making decisions about including new activities in the emissions trading scheme or accounting for them in New Zealand's NDCs.
- 20. Officials consider that, where Ministers wish to explore the inclusion of a new carbon removal activity in New Zealand's NDC, it would be appropriate to use the recently agreed and published Assessment Framework. Using the Assessment Framework will ensure that any proposed activity is scientifically robust and effective, and that activities are considered in a consistent, transparent, and evidence-based manner.

The credibility of our voluntary carbon markets is important

- 21. The Government is undertaking a programme of work to support the credibility and integrity of voluntary nature and carbon markets in New Zealand, with the objective that

⁴ National greenhouse gas inventories cover the emissions and removals taking place within national territory and offshore areas over which the country has jurisdiction.

credits generated domestically are recognised as high-quality and are valued in international markets.

22. Credits generated by Gigablue's activities may not meet the Government's expectations for voluntary climate change mitigation, namely that the credits need to be additional; durable and permanent; and real, measurable and verifiable. Gigablue has not yet provided evidence that MCFS can meet these principles.
23. Further, a MCFS carbon removals standard developed by Puro.earth has not been accredited by international bodies recognised by the Government. 9(2)(g)(i) [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
24. Gigablue's intention to generate and sell carbon credits raises potential risks. If these credits are subsequently assessed as having low integrity, this could undermine broader Government efforts to strengthen confidence in New Zealand's voluntary markets. This risk would be compounded if Government actions are also perceived as enabling or facilitating the creation and sale of such credits.

9(2)(h) [REDACTED]
[REDACTED]

[REDACTED]

■ [REDACTED]
[REDACTED]
[REDACTED]

■ [REDACTED]
[REDACTED]

■ [REDACTED]
[REDACTED]

■ [REDACTED]
[REDACTED]

■ [REDACTED]

[REDACTED]

■ [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

■ [REDACTED]
[REDACTED]
[REDACTED]

9(2)(h)

Gigablue's regulatory proposals have increased in scope

32. When Gigablue met with Ministers, they proposed changes to regulations under the EEZ Act to better support marine carbon dioxide removals. These changes are to:
 - a. create a new permitted activity that would apply to lower environmental impact marine carbon dioxide removal activities
 - b. classify larger scale marine carbon dioxide removal activities as a non-notified activity (no public hearing).
33. Ministers requested advice on how this proposal differs from an earlier proposal made to the Ministry for the Environment. The latest proposal is broader, in that it applies to all marine carbon dioxide removal technologies, where the original proposal was to apply specifically to Gigablue's technology.
34. There are significant knowledge gaps on the environmental effects of MCFS and their extent. The uncertainty or inadequacy with current information would make it difficult for the Minister for the Environment to meet her statutory requirements to make or amend regulations under Part 3 of the EEZ Act.
35. Gigablue suggests the approach to jettisoning of space vehicle debris contained within the Permitted Activity Regulations could be used as a model for developing regulations.
36. Ministers requested a comparison between MCFS and the jettisoning of space vehicle debris. Officials do not consider that MCFS and space vehicle jettison debris are similar enough to justify the same approach to regulation. Further information on this is provided in **Appendix 3**.

We recommend maintaining a watching brief

37. Officials recommend Ministers do not respond to Gigablue's request for immediate regulatory changes, and that officials maintain a watching brief on Gigablue's research activities and international developments relating to marine carbon dioxide removals.

38. Providing a more enabling legislative framework for marine carbon dioxide removal technology would need to be considered alongside other Government priorities, such as implementing the new planning system and supporting the growth of credible, high integrity voluntary nature and carbon markets.
39. International law and political consensus will continue to develop as the evidence base for marine carbon dioxide removals develops. 9(2)(g)(i)

Treaty implications

40. Proposals to enable MCFS (and marine carbon dioxide removals more broadly) are likely to affect Māori rights and interests in the marine environment, including:
 - a. fisheries related rights, such as those recognised under the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MCFS activities may impact fisheries resources and, in turn, the value and exercise of those rights
 - b. rights and interests under the Marine and Coastal Area (Takutai Moana) Act 2011, such as customary marine title / protected marine title, particularly where activities extend across multiple rohe moana
 - c. rights and interests recognised through Treaty Settlement legislation, such as statutory acknowledgements over coastal and marine areas and arrangements providing for participation in decision-making. These may be impacted where MCFS activities occur within, or have effects on areas, species, or ecosystems of significance to iwi/hapū
 - d. broader Māori rights and interests in the marine environment. Previous engagement with iwi and hapū on wider marine policy has raised concerns about activities that introduce material into the marine environment and the potential for adverse effects on the mauri of marine ecosystems and taonga species.
41. Officials understand Gigablue has undertaken initial engagement with Te Rūnanga o Ngāi Tahu. The Ngāi Tahu Claim area under the Ngāi Tahu Claims Settlement Act 1998 overlaps with the area where Gigablue wish to undertake MCFS activities.
42. Officials have not undertaken a detailed Treaty Impact Analysis or engagement with iwi/hapū on Gigablue's proposals. We consider these proposals are likely to have implications for Treaty settlements and other arrangements, particularly where they relate to iwi/hapū interests in the marine environment.

Consultation

43. The Ministry of Foreign Affairs and Trade and the Environmental Protection Authority provided input to this briefing. The Department of Conservation and the Ministry for Primary Industries were consulted.

Next steps

44. If you agree to maintain a watching brief, we will keep you informed of any developments related to Gigablue, marine carbon dioxide removal technology, and international law.
45. Officials are able to provide further advice if requested.

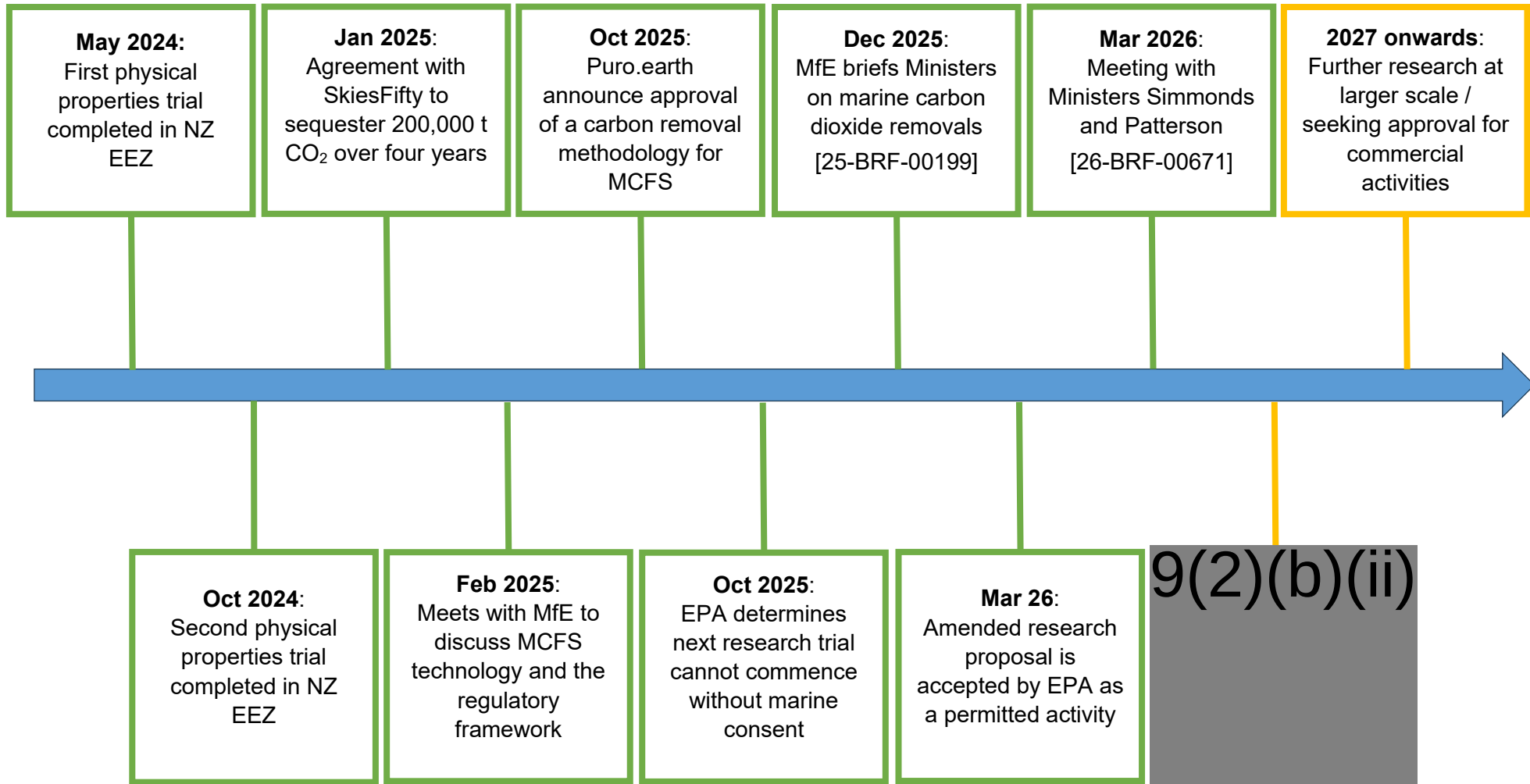
Appendices

Appendix 1: Gigablue timeline

Appendix 2: 9(2)(h) [REDACTED]

Appendix 3: 9(2)(h) [REDACTED]

Appendix 1: Gigablue timeline



Appendix 3: 9(2)(h)

Comparison of MCFS to space vehicle jettison debris

1. Gigablue has compared MCFS to the deposition of space vehicle jettison debris. Officials do not consider that MCFS and space vehicle jettison debris are similar enough to justify the same approach to regulation.
2. Space vehicle launches have been occurring in New Zealand for over a decade and contribute \$2.47b to New Zealand's economy annually. Regulation of space vehicle launches, including consistency with international obligations, is relatively mature. The environmental effects of space vehicle jettison debris are also well-understood.
3. Space vehicles jettison parts (eg, lithium batteries and external parts of the vehicle that are no longer needed) as part of the launch process. The deposition of space vehicle jettison debris was included in the Permitted Activity Regulations in 2016 to enable the space and advanced aviation sector to develop in New Zealand. This means that any jettisoned material produced during normal launch operations is not covered by dumping provisions.
4. Jettisoned material from space vehicles is considered a deposit on the seabed and is subject to several conditions. Jettisoned debris can only be made of materials specified in the Permitted Activity Regulations. These materials are like those permitted for dumping. Debris can only be jettisoned within an Authorised Launch Deposit Area off the East Coast of New Zealand.
5. Key differences between space vehicle jettison debris and MCFS are summarised in the table below.

	Space vehicle jettison debris	MCFS
<i>International obligations</i>	Not prohibited under international law.	9(2)(h)
<i>Use by other jurisdictions</i>	Jettison is a common part of space vehicle launches and is permitted by some other States.	No other countries undertaking MCFS on commercial scale.
<i>Effects</i>	• Environmental effects are well understood to be spatially limited and, depending on the scale, no more than minor. Effects have been independently assessed by Earth Sciences New Zealand. • Each deposition occurs in a very small part of the EEZ.	• Environment effects are not well understood. There is potential for widespread, severe and long-lasting effects. • MCFS activities involve large areas of the ocean column and seabed. This could extend effects beyond New Zealand's jurisdiction.

	Effects on other marine stakeholders are low. Vessels are restricted from deposition areas for a few hours after launch.	There is limited information on the impact of MCFS on other marine stakeholders (eg fisheries, transport). Exclusion zones could be required for large parts of the EEZ for an extended period of time.
<i>Importance to New Zealand</i>	Space and advanced aviation sector is strategically important to New Zealand's economy.	Limited analysis of potential benefit of MCFS to New Zealand's economy. Ability to sequester carbon dioxide unproven and cannot contribute to New Zealand's NDC.
<i>Social licence</i>	Has been publicly consulted on twice.	No information on social licence in New Zealand. Strong public interest in geoengineering and marine pollution.
<i>Materials used</i>	Jettisoned parts must be made of materials specified in the Permitted Activities Regulations. These are similar to those listed as permissible for dumping.	9(2)(h) [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted]

9(2)(h) [Redacted]
[Redacted]

6. 9(2)(h) [Redacted]⁵
 9(2)(h) [Redacted]
 [Redacted]
 [Redacted]⁶ 9(2)(h) [Redacted]
 [Redacted]
 [Redacted]
 [Redacted]⁷ 9(2)(h) [Redacted]
 [Redacted]⁸

⁵ 9(2)(h) [Redacted]
⁶ 9(2)(h) [Redacted]
⁷ 9(2)(h) [Redacted]
⁸ 9(2)(h) [Redacted]

7. 9(2)(h) [REDACTED]
[REDACTED]
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9 9(2)(h) [REDACTED]
[REDACTED] 10
8. 9(2)(h) [REDACTED]
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9. 9(2)(h) [REDACTED]
[REDACTED] 13 9(2)(h) [REDACTED]
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[REDACTED]
10. 9(2)(h) [REDACTED]
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 - 15 9(2)(h) [REDACTED]
 - 16 9(2)(h) [REDACTED]
[REDACTED]



BRIEFING

CPMG Minutes March 2026

Date:	9 April 2026	Priority:	Medium
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-00851

	Action sought	Response by
Hon Simon Watts Minister of Climate Change	Provide feedback , if any, on the draft minutes of the CPMG meeting, 30 March 2026 OR approve the draft minutes Out of scope	17 April 2026
Action for Minister's Office staff		
Provide feedback to the Climate Change IEB Unit (board@climateieb.govt.nz) OR , if the Minister has no feedback: Return the signed briefing to the Climate IEB Unit (board@climateieb.govt.nz)		

Appendices and attachments
Appendix 1: Climate Priorities Ministerial Group draft meeting minutes, 30 March 2026

Contact for telephone discussion (if required)			
Name	Position	Telephone	1st contact
Kirsty Flannagan	Executive Director	021 042 0264	
Mel Rae	Manager	9(2)(a)	✓
Libby Frampton	Author		

The following departments/agencies have been consulted

Minister's office to complete:

- | | | |
|--|---|------------------------------------|
| ☐ Noted | ☐ Approved | ☐ Declined |
| ☐ Overtaken by Events | ☐ Needs change | ☐ Seen |
| | ☐ See Minister's Notes | ☐ Withdrawn |

Minister's Comments



BRIEFING

CPMG Minutes March 2026

Date:	9 April 2026	Priority:	Medium
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-00851

Purpose

1. We seek your feedback, or approval, of the draft minutes from the Climate Priorities Ministerial Group (CPMG) meeting, 30 March 2026 (see Appendix 1).

2. Out of scope
[Redacted]
[Redacted]
[Redacted]
[Redacted]
[Redacted]

Recommended action

We recommend that you:

- a. **Provide feedback**, if any, on the attached draft minutes from the 30 March 2026 CPMG meeting in Appendix 1

OR

Approve the attached draft minutes from the 30 March 2026 CPMG meeting

Approved / Not approved

b. Out of scope

Out of scope

A handwritten signature in blue ink, appearing to read 'K Flannagan', on a light yellow background.

Kirsty Flannagan
Executive Director
Climate Change Interdepartmental Executive
Board Unit

Hon Simon Watts
Minister of Climate Change

9/04/2026

___ / ___ / 2026

Appendix 1: Draft minutes of the Climate Priorities Ministerial Group meeting, 30 March 2026

Climate Priorities Ministerial Group (CPMG) Meeting minutes			
Date	30 March 2026	Time	6:30 – 7:30pm
Venue	Ministerial Meeting Room 2.1, Executive Wing, Parliament Buildings		
Attendees	Hon Simon Watts – Minister of Climate Change, Minister for Energy, Minister of Local Government (Chair) Hon Tama Potaka – Minister of Conservation, Minister for Māori Crown Relations: Te Arawhiti Hon Penny Simmonds – Minister for the Environment Simon Court MP – Parliamentary Undersecretary to the Minister for Infrastructure and Minister Responsible for RMA Reform Hon Mark Patterson – Minister for Rural Communities		
Apologies	Rt Hon Christopher Luxon – Prime Minister Hon Nicola Willis – Minister of Finance Hon Chris Bishop – Minister of Housing, Minister for Infrastructure, Minister Responsible for RMA Reform, Minister of Transport Hon Mark Mitchell – Minister of Corrections, Minister for Emergency Management and Recovery, Minister for Ethnic Communities, Minister of Police and Minister for Sport and Recreation Hon Todd McClay – Minister of Agriculture, Minister of Forestry, Minister for Trade and Investment Hon Chris Penk – Minister for Building and Construction, Minister for Land Information, Minister for Small Business and Manufacturing, Minister for Veterans Hon David Seymour – Minister for Regulation Rt Hon Winston Peters – Minister of Foreign Affairs Hon Shane Jones – Minister for Regional Development, Minister for Resources		
Delegates	<u>Ministerial delegates in attendance</u> Claire Gunning for Rt Hon Christopher Luxon Nicky Lynch for Hon Nicola Willis Josh Smith for Hon Chris Bishop Dave Gawn for Hon Mark Mitchell Sian Kissick for Hon Todd McClay Will Daly for Hon Chris Penk Sam Purchas for Hon David Seymour Stuart Zohrab for Rt Hon Winston Peters		

[illegible]



Meeting with Gigablue on Wednesday 25 March 2026

Date:	24 March 2025	Priority:	High
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-00671

Hon Penny Simmonds
Minister for the Environment

Snapshot

You are meeting with representatives of Gigablue, who are undertaking research into marine carbon dioxide removal (mCDR) in New Zealand. They desire a more enabling regulatory framework for research and commercial activities. You and the Minister for Climate Change have recently discussed MfE officials maintaining a watching brief and not progressing further work at this stage. This position is yet to be communicated to Gigablue.

Time and date	11.45am, 25 March 2026
Venue	Parliament, meeting room EW 3.205
Attendees	Hon Mark Patterson, Associate Minister of Regional Development Gigablue attendees: Guy Shafran Liss and Sharon Naveh Ovedya Unconfirmed: Government Relations advisor from Capital NZ
Last meeting	You have not met with Gigablue before
Officials attending	Aaron Napier, General Manager – Data and Insights Products
Agenda	Gigablue have not proposed an agenda. Officials expect they want to talk about: • their technology and plans • barriers to enabling their technology • changing domestic legislation.

Contact for telephone discussion (if required)			
Name	Position	Telephone	1st contact
Aaron Napier	General Manager	027 247 1893	✓
Matthew Barbati-Ross	Manager	9(2)(a)	
Matt Adams	Author		

Meeting with Gigablue on Wednesday 25 March 2026

Key points

1. The representatives of Gigablue would like the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 to be amended to better support their novel mCDR technology. This could include broadening the scope of marine scientific research that can be permitted in the exclusive economic zone (EEZ), and more significantly, creating a more enabling consenting pathway for the commercial application of their technology.
2. Gigablue has previously had difficulty getting permission from the Environmental Protection Authority (EPA) to undertake marine science research activities. The EPA has recently assessed Gigablue's significantly modified activity, which was considered to fall within the EEZ Regulations, provided it is undertaken strictly in accordance with the description provided and that all mitigation measures are fully implemented and adhered to.
3. Gigablue intend to sell carbon credits on the voluntary carbon market from using their technology in the EEZ offshore from Otago. The sequestered carbon cannot count towards New Zealand's Nationally Determined Contribution at this time, and it likely won't be able to contribute in the short to medium term. 9(2)(g)(i)
[REDACTED]
[REDACTED]
4. MfE officials consider there are large information gaps regarding the effectiveness and safety of Gigablue's technology 9(2)(g)(i), 9(2)(h)
[REDACTED]
5. 9(2)(g)(i)
[REDACTED]
[REDACTED]
[REDACTED]
6. Officials will continue to engage with operators and scientists, and with discussions and developments under the London Convention/London Protocol. 9(2)(g)(i), 9(2)(b)(ii)
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
7. Hon Mark Patterson (Minister for Rural Communities, Associate Minister of Agriculture, Associate Minister of Regional Development) will be attending this meeting. We recommend sharing these meeting notes (excluding the talking points) and the Marine Carbon Dioxide Removal briefing (25-BRF-00199) with Minister Patterson.

OIA note: The EPA does not grant "permission" in relation to permitted activities. Rather, in September 2025, the EPA considered that the activity proposed at that point in time could not proceed as a permitted activity under the EEZ Act.

Talking Points

What is the Government position on mCDR?	• The Government is committed to meeting our climate targets. • Officials are maintaining a watching brief on the development of novel mCDR technologies. • There is no work programme for legislative change to better enable these activities in the EEZ.
Next steps for the Ministry for the Environment	• Officials will continue to engage with interested operators and scientists, and in key international forums, to keep informed.
Third party verifier	• I understand there is now a standard to certify carbon removals specific to your technology. Please tell me more about this. • Have you sold any carbon removal credits under this standard for activities in New Zealand?
If asked about EPA decisions on research permits	• While I am responsible for the EEZ Act as the Minister for the Environment, the EPA is the independent regulator responsible for making decisions on proposals for individual activities that require consent or approval. It would not be appropriate for me or the Ministry for the Environment to influence EPA decision making on those individual proposals. • I understand you modified your proposed research activity earlier this year, which was assessed and considered to fall within the EEZ Regulations, provided it is undertaken strictly in accordance with the description provided and that all mitigation measures are fully implemented and adhered to.
If asked about making regulatory changes	• I am comfortable that officials are maintaining a watching brief on the development of novel mCDR technologies. • There is no work programme for legislative change to better enable these activities in the EEZ.
9(2)(b)(ii) [REDACTED] [REDACTED]	• 9(2)(b)(ii) [REDACTED] New Zealand is committed to the London Protocol and respects the rule of international law. 9(2)(b)(ii) [REDACTED] [REDACTED] • Thank you for undertaking your science activities in New Zealand and for engaging with government agencies. I encourage you to continue to engage with the EPA and the likes of Earth Science NZ on research proposals.

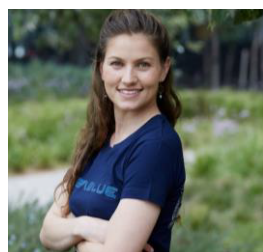
Background

8. Officials have been engaging with Gigablue since February 2025 in order to better understand its technology and how it interacts with domestic and international regulatory frameworks. Information on this was provided to you and Minister Watts in December 2025 (25-BRF-00199 refers). Gigablue has labelled its technology Marine Carbon Fixation and Sequestration (MCFS).
9. Gigablue have previously had difficulties in getting EPA permission to undertake research as a permitted activity under the EEZ Act, 9(2)(g)(i) [REDACTED]
[REDACTED]
[REDACTED] Gigablue would like changes made to the EEZ regulatory framework to better enable their activities and will likely appeal to you to make changes.
10. Since February, MfE officials have regularly requested more information from Gigablue to learn more about its technology, efficacy and effects, consistency with international law, engagement, and the benefits to New Zealand. We have recently received a large amount of information that we are still considering. However, based on our initial scans, we consider the information may not adequately answer all our questions.
11. Since communication began with Gigablue, it has supported the development of a third-party standard from Puro.earth. This enables the quantification and verification of carbon removals. This assists the trading of carbon on the voluntary carbon market. We do not know whether Gigablue has sold any credits under this standard.
12. Gigablue will also be meeting MfE and the EPA during its visit to New Zealand this week.
13. On 10 March, you met with Minister Watts to discuss several matters, including Gigablue's proposal. You agreed to MfE officials maintaining a watching brief and not progressing further work at this stage. 9(2)(g)(i) [REDACTED]

Further information about Gigablue's research activities under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act)

14. The EPA has been in ongoing discussions with Gigablue about its technology and proposed activities. The EPA's role includes receiving marine consent applications, receiving notices of permitted activities, and monitoring compliance under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act) and associated regulations.
15. Where an activity is a permitted activity under Exclusive Economic Zone and Continental Shelf (Environmental Effects – Permitted Activities) Regulations 2013 (EEZ Regulations) the EPA does not issue consent or approval and the activity may proceed as long as the notification requirements are met.
16. In September 2025 Gigablue was notified that, based on the information provided, their proposed activities were not permitted under the EEZ Regulations. Gigablue submitted an updated pre-activity notice in January 2026 for a significantly modified activity.
17. The modified activity was assessed and considered to fall within the EEZ Regulations, provided it is undertaken strictly in accordance with the description provided and that all mitigation measures are fully implemented and adhered to.

Biographies



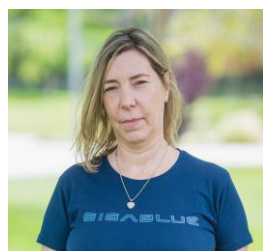
Sapir Markus-Alford (Co-Founder, Chief Technology Officer)

Sapir (Suh-Peer) is an environmental scientist responsible for R&D of Gigablue's technology. Most engagement with Gigablue has been through Sapir.



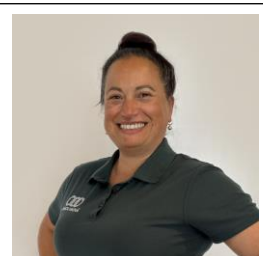
Guy Shafran Liss (Co-Founder, Chief Operating Officer)

Guy has degrees in government relations and business administration and is responsible for global operations including manufacturing, deployment, and measurement.



Sharon Naveh Ovedya (Vice-President Regulatory Compliance)

Sharon (Sha-ROHN) has a background in law and is responsible for securing permits and building relationships with governments and communities.



Cherie Tirikatene (Director Strategic Partnerships and Cultural Engagement)

Cherie has taken the lead on iwi engagement. She is based on the Chatham Islands and is the General Manager Chatham Islands for Tāmata Hauhā, which provides funding and ongoing management development for Māori landowners.

Officials understand Gigablue may also be accompanied by a Government Relations advisor from Capital NZ.



MEETING TO DISCUSS MATTERS ACROSS THE ENVIRONMENT AND CLIMATE CHANGE PORTFOLIOS

Date:	5 March 2026	Priority:	Routine
Security classification:	CLASSIFICATION	Tracking number:	26-BRF-00478

Hon Penny Simmonds
Minister for the Environment

Hon Simon Watts
Minister of Climate Change

Snapshot

You are meeting to discuss matters that intersect the environment and climate change portfolios. Matters to discuss are set out in the agenda below.

Time and date	10 March 2026 3:15 - 4:00pm
Venue	Minister Watts' office
Attendees	Minister Simmonds Minister Watts
Last meeting	
Officials attending	Becky Prebble – Acting Deputy Secretary, Climate Change Mitigation and Resource Efficiency
Agenda	• Marine carbon dioxide removal • Out of scope ■ ■ ■

Contact for telephone discussion (if required)			
Name	Position	Telephone	1st contact
Jo Gascoigne	General Manager		
Rebecca Partridge	Manager	9(2)(a)	✓
Sarah McDaniel	Author		



MEETING TO DISCUSS MATTERS ACROSS THE ENVIRONMENT AND CLIMATE CHANGE PORTFOLIOS

Key points

1. The objective of the meeting is to facilitate a discussion on matters that intersect the environment and climate change portfolios and whether there are any benefits or opportunities to be explored.

Background

2. The briefing sets out the background, progress and next steps associated with five key areas:

- Marine carbon dioxide removal

- Out of scope

- Out of scope

- Out of scope

- Out of scope

Marine carbon dioxide removal

Background

3. Driven by increasing interest in marine carbon dioxide removal (mCDR)¹ we provided you (Minister Watts and Minister Simmonds) an aide memoire on mCDR and how it is currently regulated in New Zealand [25-BRF-00199 refers].
4. mCDR, particularly marine geoengineering,² may have potential to remove significant amounts of carbon dioxide from the atmosphere. However, research on marine geoengineering is yet to prove if it is effective and safe. The international scientific community considers marine geoengineering techniques are not ready for commercial application.
5. 9(2)(h)
[Redacted]
[Redacted]
[Redacted]^{3,4} 9(2)(h)
[Redacted].
6. Recognising and rewarding non-forest removals was a key action in the second Emissions Reduction Plan. The Assessment Framework for Carbon Removals has been published, and the application process will go live shortly.

¹ Carbon removal technologies that rely on the ocean and its carbon cycle

² Deliberate intervention in the marine environment to manipulate natural processes

³ 9(2)(h)
[Redacted]

⁴ 9(2)(h)
[Redacted].



Progress (international)

7. We have been actively monitoring London Convention/Protocol intersessional work ahead of the next meeting of Contracting States in October, where the regulation of marine geoengineering will be discussed. Intersessional groups are developing assessment frameworks to support permitting of research on a range of marine geoengineering techniques.

Progress (domestic)

8. Materials to support the Assessment Framework for Carbon Removals are currently being developed. Applicant guidance states that some mCDR activities are eligible to progress through the framework, while activities that are inconsistent with international law and our domestic regulations are not eligible.
9. Gigablue is a private company developing a mCDR method – there is some uncertainty about its proprietary method which may be a type of ‘ocean fertilisation.’ Gigablue has been researching in New Zealand waters and intend to eventually apply its method here in a commercial capacity. Gigablue has recently attained Environmental Protection Authority approval to undertake further research in New Zealand's Exclusive Economic Zone off the coast of Otago.
10. Gigablue would like to meet with officials in late March to work together to develop a clear regulatory pathway for their technology. Its activities in New Zealand are likely to generate further interest from a range of other parties including from iwi, fishery right holders, eNGOs, science community, and other countries that are party to international agreements. We have recently provided RNZ with information about our meetings with Gigablue under the Official Information Act 1982.

Next steps

11. If you wish to further consider the management of mCDR, we suggest that you request advice on:
 - a. the role of mCDR alongside land-based interventions in achieving our climate commitments
 - b. a national scientific assessment of mCDR in New Zealand waters to inform research priorities and regulation settings
 - c. greater participation and influence at international forums on marine geoengineering
 - d. a review of our domestic regulations to better enable legitimate scientific research
 - e. engagement with a range of parties interested on the management of mCDR
 - f. specific engagement with Gigablue on its proposals.

Sticking point

12. New Zealand has committed to reducing carbon emissions and to remove carbon from the atmosphere to mitigate the effects of climate change. However, some methods that have potential to do this carry a high level of uncertainty around their effectiveness and effects on the marine environment.



Discussion points

13. What are Ministers' views on the priorities for managing mCDR in New Zealand?

14. Do Ministers wish to receive further advice on the management of mCDR in New Zealand?

Out of scope

[Redacted content]



Ministry for the
Environment
Manatū Mō Te Taiao

AIDE MEMOIRE

Marine Carbon Dioxide Removal

Date:	19 December 2025	Priority:	Routine
Security classification:	CLASSIFICATION	Tracking number:	25-BRF-00199

Information for Minister(s)

Hon Penny Simmonds

Minister for the Environment

Hon Simon Watts

Minister of Climate Change

Appendices and attachments

1. Information on particle-based marine carbon dioxide removal activities in relation to ocean fertilization, OceanCare

Contact for telephone discussion (if required)

Name	Position	Telephone	1st contact
Aaron Napier	General Manager	027 247 1893	✓
Matthew Barbati-Ross	Manager	9(2)(a)	
Matt Adams	Author		

The following departments/agencies have been consulted

Ministry of Foreign Affairs and Trade

Minister's office to complete:

☐ Needs change

☐ See Minister's Notes

☐ Noted

☐ Withdrawn

☐ Overtaken by Events

☐ Seen

Minister's Comments



AIDE MEMOIRE

Marine Carbon Dioxide Removal

Date:	19 December 2025	Priority:	Routine
Security classification:	CLASSIFICATION	Tracking number:	25-BRF-00199

Purpose

1. This aide memoire provides information about marine carbon dioxide removal, which is increasingly being looked to as a response to climate change. It provides details of how this is regulated internationally and in New Zealand. It also sets the context for matters being experienced with Gigablue, who is undertaking research activities in New Zealand's exclusive economic zone.

Aaron Napier
General Manager, Data and Insights Products
Strategy, Stewardship and Performance, Ministry for the Environment

18 / 12 / 2025

Key messages

1. Climate change is driving interest in new technologies that may help to mitigate its effects. The ocean absorbs significant amounts of carbon dioxide and may have potential to absorb more. Carbon removal technologies relying on the ocean and its carbon cycle are known as marine carbon dioxide removal (mCDR).
2. There are a wide range of mCDR methodologies. Some of these methodologies manipulate natural processes at a large scale and are known as marine geoengineering. Marine geoengineering includes methods known as ocean fertilisation and enhanced ocean alkalinity.
3. Marine geoengineering may be able to remove significant amounts of carbon dioxide from the atmosphere; however, it is controversial due to difficulties in proving its efficacy and concerns about potential adverse, widespread, long-lasting, and severe environmental effects.
4. As a result, international environmental law takes a precautionary approach to regulating marine geoengineering techniques, prohibiting commercial application but allowing small-scale legitimate scientific research.
5. Our domestic framework is designed to give effect to our international obligations and is generally prohibitive to marine geoengineering activities. However, the domestic framework was drafted before these technologies were well known, and it lacks clarity on how to manage marine geoengineering.
6. 9(2)(h) [REDACTED]
7. The activities of an mCDR operator called Gigablue in New Zealand have already drawn international scrutiny 9(2)(g)(i) [REDACTED]
8. We would like to meet with you to discuss the contents of this briefing and to consider next steps.

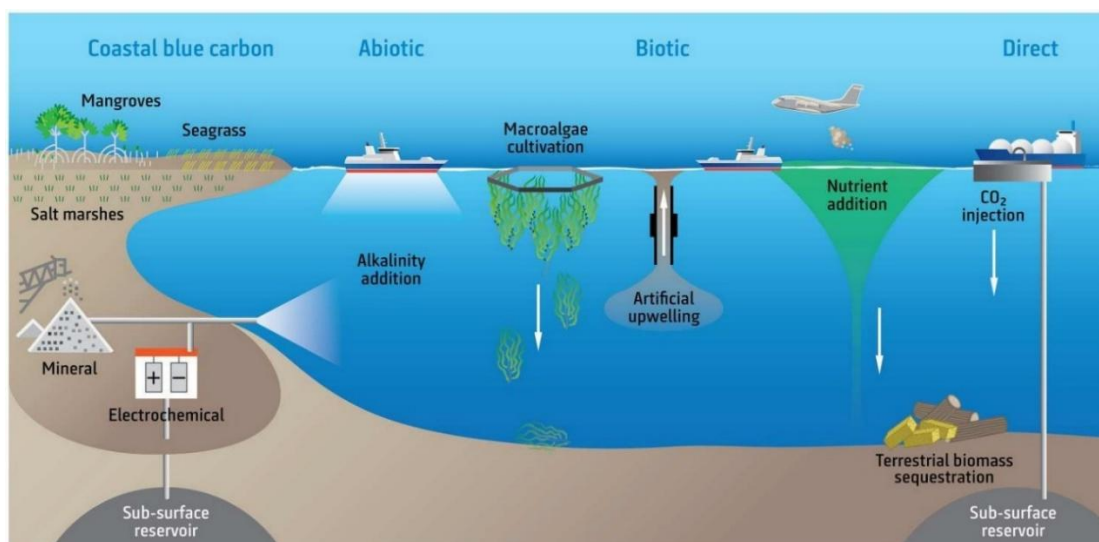
Background

The need to respond to climate change is driving interest in marine carbon dioxide removal

9. The ocean is critical to stabilising the Earth's climate. It has absorbed approximately 25 percent of global carbon dioxide emissions, and more than 90 percent of the excess heat generated by those emissions (*Our Marine Environment 2025*). It has been identified as a potential carbon sink that could be further utilised to help mitigate climate change.
10. The Intergovernmental Panel on Climate Change considers that carbon dioxide removal from the atmosphere is essential if net zero carbon dioxide emissions are to be achieved. This is built on in New Zealand's second emissions reduction plan 2026–30, which identified non-forest removals as a potential pathway to lower emissions.
11. The weight of information on climate response has increased interest in carbon dioxide removal technologies in New Zealand.

There is a wide range of marine carbon dioxide removal methodologies

12. Non-forest removals include a broad range of carbon sequestration through biological, geological, oceanic, chemical, and technological processes. Methods of non-forest removal that happen in the ocean are called marine carbon dioxide removals (mCDR).
13. There are a range of mCDR methodologies. Some of the methodologies are relatively well understood and are not controversial (such as blue carbon). More novel approaches, such as marine geoengineering, have uncertainty around their efficacy and environmental effects and are more controversial.
14. Marine geoengineering is defined as any deliberate intervention in the marine environment to manipulate natural processes, including to counteract anthropogenic climate changes and/or its impacts.¹ Although these interventions may have the potential to remove large volumes of carbon dioxide, they also have the potential to cause deleterious environmental effects that may be widespread, long lasting, or severe.
15. Examples of mCDR methodologies are listed below; marine geoengineering methodologies are marked with an asterix (*).
 - a. **Blue carbon** – More effective management of coastal ecosystems (such as wetlands, mangroves, and sea grasses) that protect existing carbon sinks and establishes new ones.
 - b. **Carbon capture and storage** – Capturing carbon dioxide and permanently storing it in sub-seabed geological formations to prevent it from entering the atmosphere.
 - c. **Enhanced ocean alkalinity (Carbon mineralisation / Enhanced rock weathering)*** – Increasing the alkalinity of seawater to enhance the uptake of atmospheric carbon dioxide by the ocean by adding alkaline-rich minerals to the ocean or by electrochemistry/electrodialysis.
 - d. **Ocean fertilisation*** – Any activity undertaken by humans with the principal intention of stimulating primary productivity (the growth of phytoplankton) in the oceans. It does not include conventional aquaculture or creation of artificial reefs.
16. These and other mCDR methodologies are depicted below.²



¹ As defined under the 2013 amendment to the London Protocol

² Cliff S. Law & Rebecca J. McLeod (07 Aug 2025): *Is marine carbon dioxide removal right for Aotearoa New Zealand?*, *New Zealand Journal of Marine and Freshwater Research*, DOI: [10.1080/00288330.2025.2525174](https://doi.org/10.1080/00288330.2025.2525174)

Recognising mCDR in Nationally Determined Contributions is problematic

17. Greenhouse gas (GHG) removals from the marine environment (beyond the coastal zone) are not currently included in Paris Agreement reporting requirements or the guidelines for national GHG inventories. This omission is not due to a lack of consideration but reflects scientific and technical challenges. Monitoring carbon in the open ocean is complex, costly, and uncertain. Scientific unpredictability and the difficulty of verifying marine carbon storage add to these challenges, so efforts to date have mainly focused on land-based removals.
18. For these activities to count towards Nationally Determined Contributions or be part of the Paris Agreement's crediting mechanism, they must be included in national GHG inventories. There are no standardised methods to measure, report, and verify that the removal of carbon dioxide from the atmosphere has occurred as a result of these activities. There is also a lack of clarity around whether marine activities could be delineated consistently with the principles of national GHG inventories. This becomes important for the allocation of emissions to territorial waters (including if removals take place beyond a country's territorial waters).

9(2)(h)

[REDACTED]

[REDACTED]

21. 9(2)(h) [REDACTED]

22. 9(2)(h) [REDACTED]

23. 9(2)(h) [REDACTED]

24. 9(2)(h) [REDACTED] 9(2)(h)

25. 6(b)(i) [REDACTED]

6(b)(i)

In 2023, Australia updated its sea dumping legislation specifically around marine geoengineering, to put in place additional environmental safeguards around these technologies.

26. We, alongside the Ministry of Foreign Affairs and Trade (MFAT), can provide you with further advice on our international obligations and relationships if you would like.

Our domestic framework 9(2)(h)

27. The Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act) regulates activities in the exclusive economic zone and continental shelf (EEZ). It enables the implementation of New Zealand's international obligations, including UNCLOS, LC/LP, and the CBD. The Resource Management Act 1991 regulates activities within the territorial sea. There are similarities and differences between the regulation in the EEZ and territorial sea. These are not examined further here as there is immediate interest in our EEZ, however similar issues likely exist.

28. 9(2)(h)

30. 9(2)(h)

Marine geoengineering scientific research

31. The EEZ Act also provides for marine scientific research under the Exclusive Economic Zone (Environmental Effects—Permitted Activity) Regulations 2013 (Permitted Activity Regulations). The Permitted Activity Regulations allow marine scientific research to occur if operators comply with notification and reporting conditions. This is managed by the Environmental Protection Authority (EPA).
32. However, the Permitted Activities Regulations application to marine geoengineering research is tenuous, as dumping activities are explicitly excluded from the Permitted Activity Regulations. This makes it difficult for potential marine geoengineering operators to undertake research to prove the effectiveness and effects of their techniques, restricting the potential to develop methods that could reduce carbon emissions.

33. 9(2)(h)

³ 9(2)(h)

34. For example, the Permitted Activity Regulations do not require the ocean fertilisation assessment framework from the 2013 LC/LP amendment to be taken into account when permitting small-scale marine scientific research. The framework considers, amongst other things, financial gain, sharing and review of research, and environmental assessment (which considers the amount and composition of the substances being used).⁴ In doing so, it can help States to manage the risks associated with such research.

35. This could be a useful tool for guiding research proposals and for the EPA to assess research activities, while providing for greater transparency and public scrutiny of marine geoengineering activities. 9(2)(h)

9(2)(g)(i)

9(2)(g)(i)

38. Gigablue is a private company developing a mCDR technology they call 'Marine Carbon Fixation and Sequestration' (MCFS).⁶ Based on the limited information that has been made available to officials, MCFS may meet the definition of ocean fertilisation because it intends to stimulate primary productivity. This is contested by Gigablue.

39. Gigablue has undertaken two small-scale research trials in the EEZ off the east coast of the South Island. The initial trials were conducted as marine scientific research under the Permitted Activity Regulations.

40. Gigablue has since sought to notify further, significantly larger trials with commercial dimensions. These plans have stalled as the EPA grapples with some of the issues identified above. 9(2)(h)

⁴ The assessment framework requires:

- the activity to be designed to answer question that will add to scientific knowledge
- peer review of the methodology
- no financial gain to arise directly from the experiment or its outcomes
- results to be published in a peer reviewed scientific publication and a plan to make the data and outcomes publicly available
- sufficient financial resources to fulfil the complete program of work
- environmental assessment
- monitoring.

⁵ 9(2)(g)(i)

⁶ MCFS involves placement of minerals such as iron and manganese within capsules made of cellulose and vermiculite. These particles are intended to promote phytoplankton growth and eventually sink to the ocean floor to sequester carbon.

41. Gigablue's activities have already drawn attention from the international community,⁷ and been widely reported in the media. They have been the subject of several Official Information Act requests.
42. Gigablue intends to sell carbon credits on the voluntary carbon market. 9(2)(g)(i)
- [REDACTED]
- [REDACTED]
- [REDACTED]

Next steps

43. We would like to meet and discuss this matter with you. We can provide further advice on marine geoengineering, our international obligations, opportunities to develop New Zealand's position on mCDR, or potential policy options for enabling small-scale legitimate mCDR research.

Appendices

OceanCare. (2025, September 5). *Information on particle-based marine carbon dioxide removal activities in relation to ocean fertilization* (LC 47/5/5). Forty-seventh Consultative Meeting of Contracting Parties to the London Convention & Twentieth Meeting of Contracting Parties to the London Protocol, 27–31 October 2025.

⁷ Concerns were raised at the October meeting of Contracting Parties of the LC/LP about a mCDR operator (not naming Gigablue) in New Zealand undertaking ocean fertilisation. A paper was presented and this is attached. During discussions the unproven effectiveness of MCFS and other mCDR methodologies was raised alongside the lack of information on their potential environmental effects. The discussion considered whether to issue New Zealand with a letter of concern to request an explanation of our actions as they relate to the London Protocol, however this was not progressed.

Appendix 1: Information on particle-based marine carbon dioxide removal activities in relation to ocean fertilization, OceanCare

FORTY-SEVENTH CONSULTATIVE
MEETING OF CONTRACTING PARTIES TO
THE LONDON CONVENTION
&
TWENTIETH MEETING OF CONTRACTING
PARTIES TO THE LONDON PROTOCOL
27-31 October 2025
Agenda item 5

LC 47/5/5
5 September 2025
Original: ENGLISH
Pre-session public release: ☐

MARINE GEOENGINEERING INCLUDING OCEAN FERTILIZATION

Information on particle-based marine carbon dioxide removal activities in relation to ocean fertilization

Submitted by OceanCare

SUMMARY

Executive summary: This document raises concerns about a proposal in which particle-based marine carbon removal constitutes ocean fertilization in direct contravention of the London Protocol's 2013 amendment. It summarizes the rapid scale-up ambitions of a commercial operator in this sector, the absence of robust scientific evidence, and the potential for significant ecological harm.

Action to be taken: Paragraph 11

Related document: Resolution LP.4(8)

Introduction

1 In January 2025, a private entity developing marine carbon dioxide removal (mCDR) techniques announced the signing of a 200,000-tonne deal with a global investment company focused on sustainability in the aviation sector. The agreement covers the sequestration of 200,000 tonnes of carbon dioxide (tCO₂) over a four-year period commencing from January 2025. This is the largest mCDR offtake agreement to date.

2 The following timeline provides information on relevant activities to date:

- .1 2022 – a commercial operator in the mCDR sector is founded by four entrepreneurs with, in the view of the sponsor, limited expertise in biology, chemistry, oceanography or environmental science;
- .2 2023 – the operator submits a patent application for a particle described as a "nano bio-composite nutrient carrier containing a water-soluble polymer with an iron nutrient, nourishing an aquatic organism". There is no evidence that this patent has been granted;

- .3 2024 – first trial sinking particles in the Mediterranean; two further trials in New Zealand's exclusive economic zone (EEZ) are carried out as a research activity under the Permitted Activity Regulations of the New Zealand Environmental Protection Agency (EPA) releasing 60 cubic metres of particles; the operator also engages with the National Institute for Water and Atmospheric Research (NIWA) in New Zealand, which raises concerns about anoxic risks, and begins developing a "Marine Carbon Fixation and Sequestration" (MCFS) protocol with a carbon registry and carbon credit marketplace;
- .4 2025 – an offtake agreement for 200,000 tonnes of carbon was signed; limited eDNA analysis is undertaken by the Cawthron Institute, the study is very limited in scope and provides no guarantee that deployments would not have adverse effects. As of July, no marine consents have been granted by the New Zealand EPA; and
- .5 2025 - 2026 (austral summer) – a larger trial is planned off the South Island of New Zealand involving up to 1,000 cubic metres (m³) of particles, and using bigger particles with longer duration (presumably longer surface duration).

3 The mCDR removal operator has stated that they intend to remove over 161 million tCO₂ equivalent by 2030.

Concerns regarding proposals for particle-based marine carbon removal and potential attempts at commercial-scale ocean iron fertilization

4 Resolution LP.4(8) defines ocean fertilization as "any activity undertaken by humans with the principal intention of stimulating primary productivity in the oceans. Ocean fertilization does not include conventional aquaculture, or mariculture or the creation of artificial reefs".

5 A voluntary carbon market registry protocol claims that the MCFS methodology it is developing for a private operator "does not apply for ocean iron fertilization (OIF) approaches. While OIF, defined as an addition of small amounts of iron to the surface water to stimulate algal blooms, meets the first criteria, it doesn't meet the second as it lacks additional sinking mechanisms". This is an inaccurate interpretation of the London Protocol definition of ocean fertilization, which does not require a specific pathway for carbon export. The act of stimulating phytoplankton growth with the intention of enhancing the carbon flux is sufficient to meet the definition. The protocol further states that adherence to the London Protocol and resolution LP.4(8) "is not required in this methodology". As such, it appears to circumvent the prohibition on deployment or commercialization of ocean fertilization activities under LP.4(8). The protocol also does not refer to the Ocean Fertilization Assessment Framework. It should be noted that the interpretation of international law is well outside the remit of bodies set up to verify carbon credits.

6 The patent submitted by the private mCDR removal operator would allow for many possible permutations of their particle, but the basic construction consists of the following three elements with possible materials to be used being drawn from a second pre-activity notice filed with the EPA: (1) a core e.g. vermiculite, which may contain a gas and thereby providing buoyancy; (2) a barrier layer to control gas exchange and to bind components together e.g. carnauba wax and; (3) and a scaffold layer e.g. tuff.

7 The operator has not made public the actual components used in the particles, claiming that they are proprietary. And the operator's claim that "Almost everything, basically, that exists on land can be found in the ocean" is questionable and rather misleading. Vermiculite, for example, is uncommon in marine sediments compared to other clay materials. It is highly unlikely that an area of the seabed covered in vermiculite would ever occur naturally.

8 The operator has claimed that the scaffold would be the main locale for the concentration of phytoplankton but the following concerns exist around the particles and their proposed function:

- .1 the assumption that phytoplankton will reliably aggregate in and on the particles is highly speculative and contrary to the natural behaviour of phytoplankton, which photosynthesize in the open ocean and do not congregate in shaded structures. Moreover, accumulations of the particles on the ocean surface will shade the upper layers of the ocean likely leading to a net reduction in primary productivity;
- .2 if, as the operator claims, the iron or other fertilizers are not released into the water then it would not be possible for the phytoplankton to access them;
- .3 diffusion of the fertilizer into the surrounding waters may induce phytoplankton blooms although the operator claims that there is no such diffusion but phytoplankton fertilization will only occur with diffusion into the water;
- .4 decomposition of the sunken residual biomass beneath the surface mixed layer can deplete oxygen in the locality and also release greenhouse gases;
- .5 the assumption that sinking particles will sequester significant quantities of organic carbon in the deep ocean is not only questionable given the likelihood of the issues raised in paragraph 8.1. Moreover, tracking the journey of the organic carbon to the deep ocean is inherently difficult and there is a strong likelihood that a substantial portion of organic carbon may be recycled back to the atmosphere due to decomposition and feeding by higher-level organisms;
- .6 the reported rates at which particles sink (up to a hundred metres per hour) might shear off algae from the particles owing to the rapid descent; and
- .7 it has been shown that iron fertilization can lead to the risk of nutrient robbing, meaning that the overconsumption of nutrients during a phytoplankton bloom can deprive other regions of the ocean of nutrients leading to reduced overall productivity, but which may only manifest decades later (Tagliabue et al. 2023, "Ocean iron fertilization may amplify climate change pressures on marine animal biomass for limited climate benefit" see <https://doi.org/10.1111/gcb.16854>).

9 There are considerable environmental risks with the proposal, and no evidence has been provided to address them:

- .1 the private operator has stated that its work was inspired by nature and is "very, very environmentally safe", that "the particles are so benign that they have zero impact on the ocean" and that "we leave no trace in the area where we deploy and operate";

- .2 the operator aims to capture 10 metric tCO₂ for each tonne of particles it deploys but has not released any studies demonstrating those rates are realistic. Even at that rate, the operator would need to disperse at least 20,000 tonnes of particles in the ocean. Furthermore, it is likely that when the particles sink, the mass of organic matter contained in them is only a small part of the total mass of the particles. It is therefore more likely that a very large mass of particulate material would be required to sink sufficient quantities of organic matter, possibly many times the amount of the organic matter;
- .3 the particles will likely attract bacteria, which have the potential to reduce oxygen levels in surface waters and in deep waters. If a phytoplankton bloom is induced, any subsequent die-off could lead to the production of potent greenhouse gases including methane and nitrous oxide;
- .4 shifts in the composition of plankton and microbial communities, with potential higher order impacts through the food web;
- .5 physical harm to larger organisms including fish, mammals and birds, including through ingestion of the particles;
- .6 benthic smothering which could include suffocation of organisms on the sea floor and a weakening of the natural sequestration of carbon in sediments;
- .7 repeated deposits of the particles on the seabed will have a clear physical impact and will also impact biogeochemical processes in the sediments; and
- .8 at scale, the spreading of particles is proposed across the ocean using commercial shipping. Such deployment and the associated impacts would be near impossible to monitor.

10 The EPA has treated deployments to date as research activities under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act. The EPA has not yet publicly commented on how it would handle a future commercial application for such activities.

Action requested of the governing bodies

11 This document is submitted to raise awareness of the commercial intent of a company proposing ocean fertilization techniques, which in the view of the sponsor, would be in direct contravention of the 2013 amendment to the LP. In that regard, the governing bodies are invited to:

- .1 note the information provided in this document and comment as they deem appropriate; and
- .2 encourage Contracting Parties and businesses connected to this issue not to act in contravention of the 2013 LP amendment and to apply the provisions of that amendment, in particular the Ocean Fertilization Assessment Framework.