

# SHORT SCIENCE SUMMARY

## Ocean Carbon Markets Australia and New Zealand

### KEY POINTS

△ Australia's and New Zealand's blue economy participants are well-placed to take advantage of their access to the natural capital of the ocean in the immature but emerging global ocean carbon markets.

The range of ocean-based and ocean-derived negative emissions technologies (Figure 1) and associated projects that are ready for development could benefit coastal communities with jobs and skills.

They will help address the direct physical impacts of climate change, while claiming a large share of the \$1trillion+ (as described by surveyed contributors) of investment opportunities now available, reducing barriers to trade in a lower emissions economy.

△ Ocean carbon projects are investable now, Figure 2 shows blue and ocean carbon project opportunities available for development and investment. Stakeholder engagement in our study shows that research and industry is on track to ensure projects with quantifiable co-benefits can be implemented in as little as 5 to 10 years.

△ There are a few key barriers that need addressing to enable this market to thrive. All of these can be addressed with funding and focus of stakeholders in a position to respond to the opportunity. Barriers to the development of blue and ocean carbon removal offsets have been explored in this report, setting the scene for governments to better realise the blue and ocean carbon wealth of their nations.

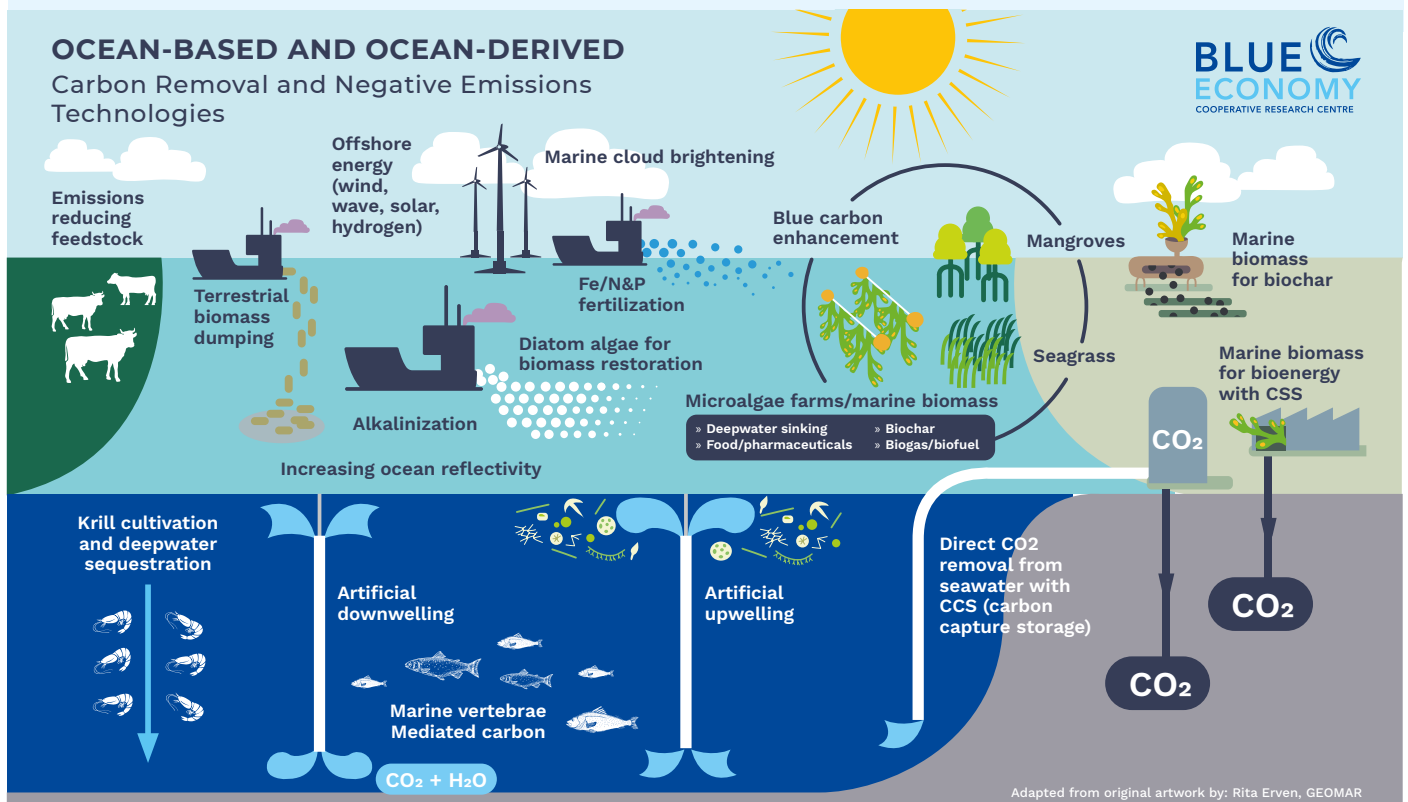


Figure 1. Ocean-based and Ocean-derived Carbon Removal and Negative Emissions Technologies

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### THE CHALLENGE

**This study** provides an industry lens to sizing ocean carbon markets and opportunities for the Blue Economy CRC via desktop studies and key stakeholder interviews and surveys. It references recent and planned research and carbon methodologies work being progressed by others.

**Our survey** set out to better understand the voluntary carbon market and the role of ocean-based and ocean-derived carbon. We have explored what is ready now and what are the gaps and challenges.

**This is a first phase** of a strategic assessment of ocean carbon markets in Australia and New Zealand, that will help the Blue Economy CRC and others define their roles in addressing barriers and enabling their members, partners and investors to participate in ocean carbon project development opportunities.

**The reports produced for this study** are intended for a broad audience, and to help describe an evolving opportunity with a variety of opinions and levels of complexity. Its goal is the identification of active and potential participants/ stakeholders and their involvement in the space of blue and ocean carbon. The reports are intended to support stakeholders to navigate their near and longer-term decision making and participation opportunities. The scope of this study did not include the development of blue and ocean carbon methodologies.

### THE OPPORTUNITY

#### Market Size

Currently, carbon markets are largely land focussed, ocean-based carbon markets are immature. Over 50% of stakeholders surveyed described the potential scale of ocean-based carbon markets as having the potential to be larger or significantly larger than land-based markets. Recent reports (Bertram et al. 2021) have estimated Australia as “the largest contributor to global blue carbon wealth”. A survey conducted for this study confirmed a market size for Ocean Carbon as between \$300billion and \$1.2trillion.

### OUR RESEARCH

#### Study process and stakeholders

Over the scoping study time frame (October 2021 - February 2022) we directly engaged feedback from more than 150 subject matter experts across the stakeholder groups identified as playing a strategic role in Ocean-based Carbon Markets in Australia and New Zealand.

This research was conducted under approval from the University of Tasmania Human Research. This research complied with the National Statement on Ethical Conduct in Human Research 2007.

#### Study results

The reports provide synthesised information not currently available in the public domain. Stakeholders shared their views on what should be included in fundamental definitions such as ‘Ocean carbon markets’ ‘Ocean-based and Ocean-derived carbon removal and negative emissions technologies’.

Stakeholders also defined risks, gaps and development opportunities that are hindering progress of ocean-based carbon markets. Industry representatives shared their approach and scale to address emissions reduction efforts to achieve declared targets, and investors shared investment criteria for high demand projects (with perceptions of shortage of supply).

Our survey participants confirmed their preference for internationally trading carbon markets, brokering ocean-based carbon offsets that include co-benefits.

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■ Investor ready    
 ■ On the way to be investor ready    
 ■ Significant further work required to be investor ready

	Sea grass, tidal marsh, and mangrove protection and restoration	Offshore energy production (wind, solar, wave hydrogen)	Terrestrial biomass sinking	Macroalgae cultivation	Offshore C capture and storage	Krill (and marine vertebrate?) cultivation and sinking	Geo-engineering (ocean fertilisation, alkalinisation, & increasing ocean reflectivity)
Key Projects							
Research	Available	Further research needed	Available	Available	Medium	Further research needed	Further research needed
Prototyping, Implementation, Testing	Complete	Partly lacking	Partly lacking	Complete	Medium	Lacking	Partly lacking
Risks	Low	Medium	Low	Low	Medium	Medium	High
Funding Availability	Medium	High	Medium	Medium	Available	Low	Low
Carbon Accounting Tools	Available	Available	Available	Medium	Available	Lacking	Lacking
Co-benefits	High	Medium	Low	Medium	Low	Medium	Low

Figure 2. Ocean Carbon Readiness Matrix for investable ocean-based carbon removal and ocean-derived negative emissions project development opportunities

Ocean carbon removal accelerates natural sequestration processes, some with numerous co-benefits (such as increased biodiversity and improving ocean acidification)

Globally there is rising investor and project development activity addressing ocean carbon removal, In Australia and New Zealand, activity is currently focused on:

- Macroalgae (seaweed) cultivation (feedstock/food/ pharmaceuticals)
- Macroalgae (seaweed) cultivation (sinking), deep water sequestration of biomass
- Macroalgae (seaweed) cultivation (biochar)
- Seagrass protection and restoration
- Mangrove protection and restoration
- Tidal marsh protection and restoration
- Macroalgae (seaweed) cultivation (biogas/biofuel products)
- Carbon capture and storage
- Offshore energy production (wind, solar, wave, hydrogen)

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### Outcomes & Recommendations

We asked our stakeholders ‘why are there not more approved ocean-based carbon projects in development?’, the responses have been collated as recommendations that are addressing the challenges or barriers identified:

1. Prioritisation for the full suite of blue and ocean-based carbon markets opportunities to be aligned to land based carbon markets, enabling the opportunity for a strategic national plan for international and domestic supply of project development to participate in emerging international voluntary carbon markets;
  - a. Enable or upgrade regulatory mechanisms to also support ocean carbon opportunities alongside land; carbon opportunities;
  - b. Prioritise funding to target the barriers limiting confidence in validating ocean carbon projects today;
  - c. Reduce the high costs and accessibility of rigorous and bespoke carbon accounting requirements to satisfy regulatory requirements designed for land-based carbon projects;
  - d. Clarify processes for easy access to permits enabling strategic project development access to ocean and blue carbon resources, including access to commonwealth and international waters for ocean harvesting;
2. Engage across research/investor/developer/ community stakeholders to align opportunities -
  - a. Educate and guide alignment across regulators, carbon markets experts and scientists on readiness of research and methodologies in the ocean carbon sector;
  - b. Align and collaborate across blue and ocean carbon industry groups, on mission, priorities and awareness of progress.
3. Greater transparency of financial investment criteria and associated assurance requirements:
  - a. Knowledge sharing across potential project developers to confirm what funds are accessible for projects so there is greater supply through alignment with performance criteria;
  - b. Prompt standardised methods to quantify and value durable sequestration co-benefits (social, economic and environmental benefits) that align to investible metrics for ocean carbon projects;

The Blue Economy CRC and its industry partners could consider playing a role to enable broader participation in Ocean Carbon Markets in Australia and New Zealand, suggestions include:

2. Expand the role of **Blue Economy Zones**, championed by the Blue Economy CRC, to support ocean carbon technologies seeking testbed sites for trialling all aspects of developing sustainable economic activities offshore;
3. Provide project development initiation support, including natural capital (or carbon) accounting and other project assurance activities for project developers i.e share industry capability and resources to enable project development;

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1. Sponsor research necessary to underpin robust and defensible ocean carbon accounting methodologies, and to demonstrate the potential of offshore activities undertaken by existing and future participants of carbon markets;
2. Prompt cross industry/sector engagement on specific project development opportunities that have large scale impact and create a register of active investment and project development opportunities, with key project metrics, to be accessible by industry partners and investors.
3. Further explore the Environmental Management Accounting (EMA) & Integrated Reporting that will pave the way for next generation ocean carbon methodologies and accounting assurance programs.
4. Represent ocean carbon project developers and associated stakeholder groups in direct engagement with government bodies - prompting international ocean carbon market opportunities with specific local project opportunities (and address regulatory challenges that delay and prevent development);
5. Facilitate introductions between industry sponsors, project developers, investors, technology providers; and
6. Directly engage and collaborate with leading ocean carbon research and industry groups globally and in Australia and New Zealand.

### NEXT STEPS

- Webinar and engagement session 28th March 2022

### PROJECT TEAM

- △ Marcus Haward (University of Tasmania)
- △ Dr Sebastian Leuzinger (Auckland University of Technology)
- △ Marni Oaten (OCT Emissions Solutions)
- △ Vere Michiels (OCT Emissions Solutions)

### PROJECT REPORTS/PUBLICATIONS

This research was conducted under approval by the University of Tasmania Human Research Ethics Committee as a project "Ocean Based Carbon Markets" (Project ID: 26600). This research complied with the National Statement on Ethical Conduct in Human Research 2007 (updated 2018).

### AUTHOR

Marni Oaten (OCT Emissions Solutions)