

CO₂ Storage Resource Catalogue

Cycle 5 Report

OCEANIA

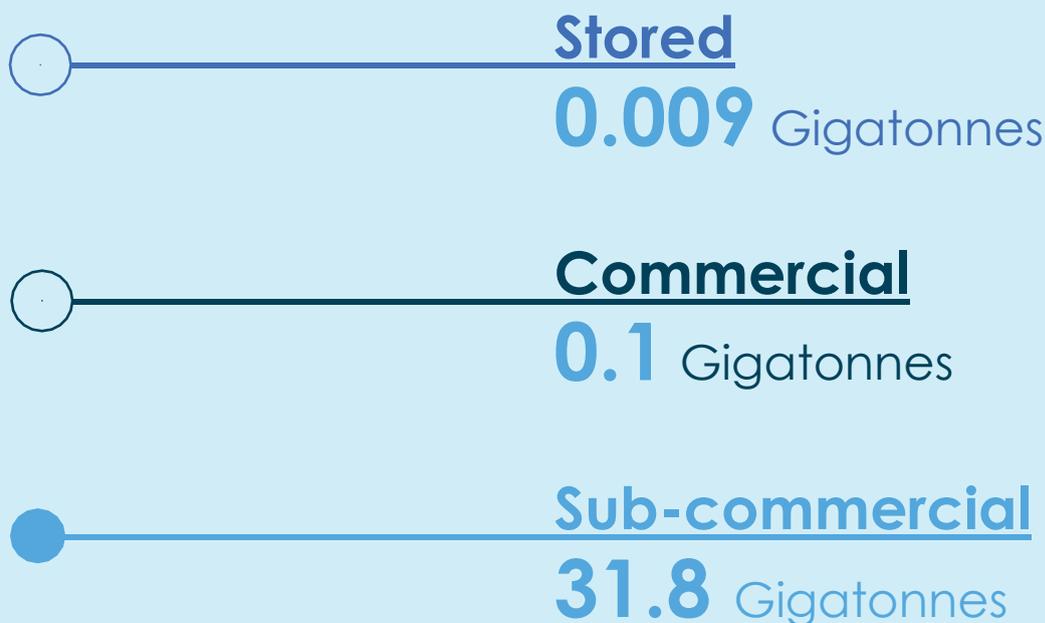
August 2025



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Amounts of CO₂



Undiscovered
473 Gigatonnes

Appendix E : Oceania

Australia, New Zealand, Pacific Island Countries

Document Summary	
Client	Oil and Gas Climate Initiative (OGCI)
Title:	CO ₂ Storage Resource Catalogue – Appendix E: Oceania
Distribution:	OGCI, GCCSI, Halliburton
Classification:	Public
Date of Issue:	20/08/2025
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1 Australia

1.1 Summary

Australia was assessed during Cycle 1 and updated during Cycle 2 and Cycle 3 and injected volumes to date updated in Cycle 4. The CSRC has identified a CO₂ storage resource for Australia as follows:

	CO ₂ storage resource (Gt)	
	Project and no project	Project specified only
Stored	0.009	0.009
Capacity	0.111	0.111
Sub-Commercial	31.356	1.110
Undiscovered	470.953	0.361
Aggregated*	502.429	1.591

* The aggregated resource represents the summed storage resource across all maturity classes and as such should not be viewed as representative of the potential of Australia.

Table 1-1: Storage resource classification summary for Australia.

- There are currently 69 sites at both a local and regional scale, located across a minimum of 14 basins, both onshore and offshore. 13 of these evaluations have a project defined.
- As of May 2024, over 10 Mt of CO₂ has been injected to deep geological storage. 9 Mt (published data) in the Chevron-operated Gorgon project and 0.055 Mt in the CO₂CRC Otway Research Facility.
- Australia remains the most highly ranked country in the world for CCS specific legislation, according to the GCCSI Legal and Regulatory Indicator

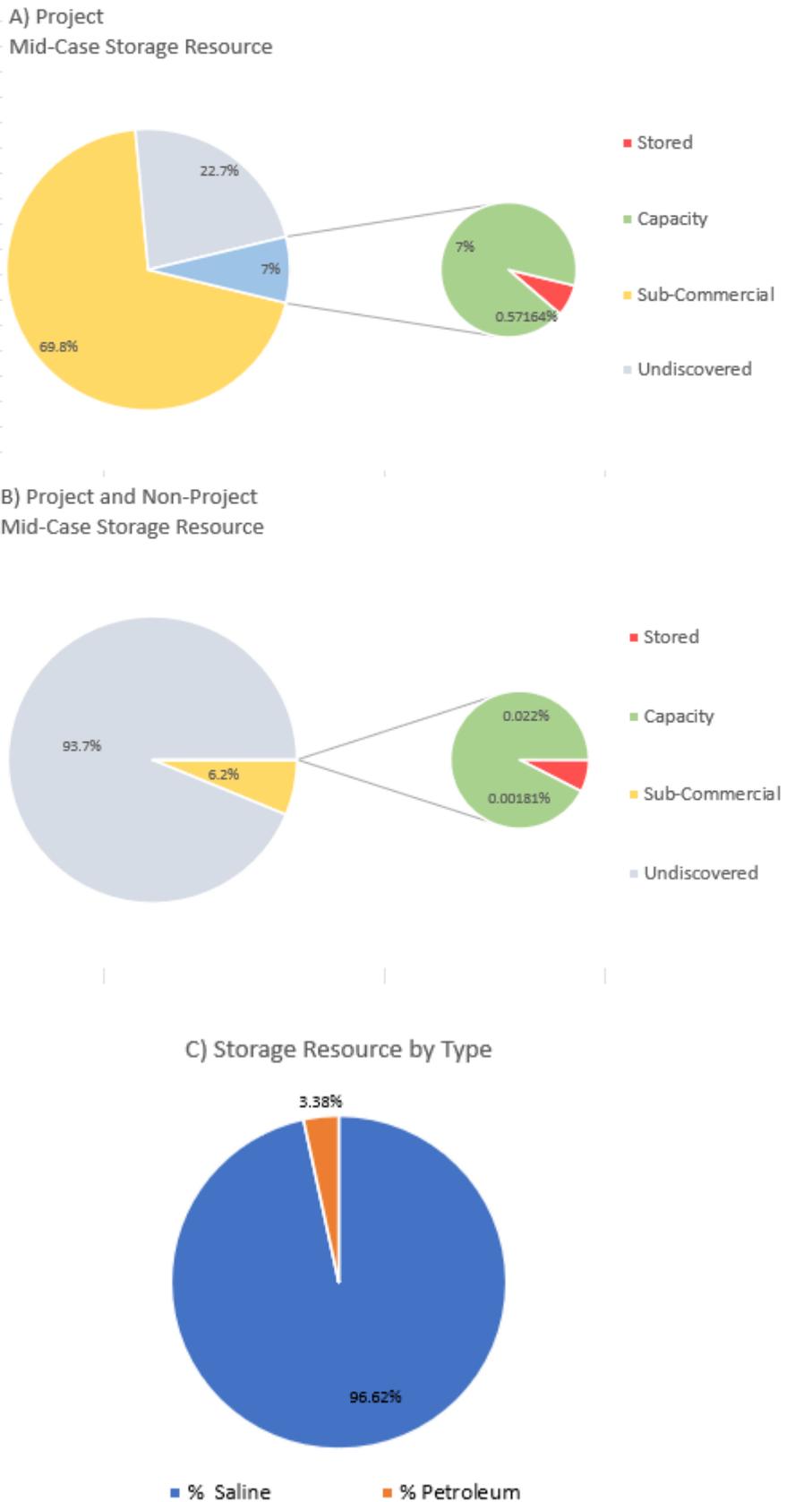


Figure 1-1: Australia spread of Storage Sites

A) Above: Spread of storage resource in Australian sites (69) across SRMS classifications, where a project has been specified. B) Spread of storage resource in all Australian sites across SRMS classifications; both project specified and not. C) Split of Australian storage resource between saline aquifers and hydrocarbon fields, both project specified and not.

1.2 Resource Statement

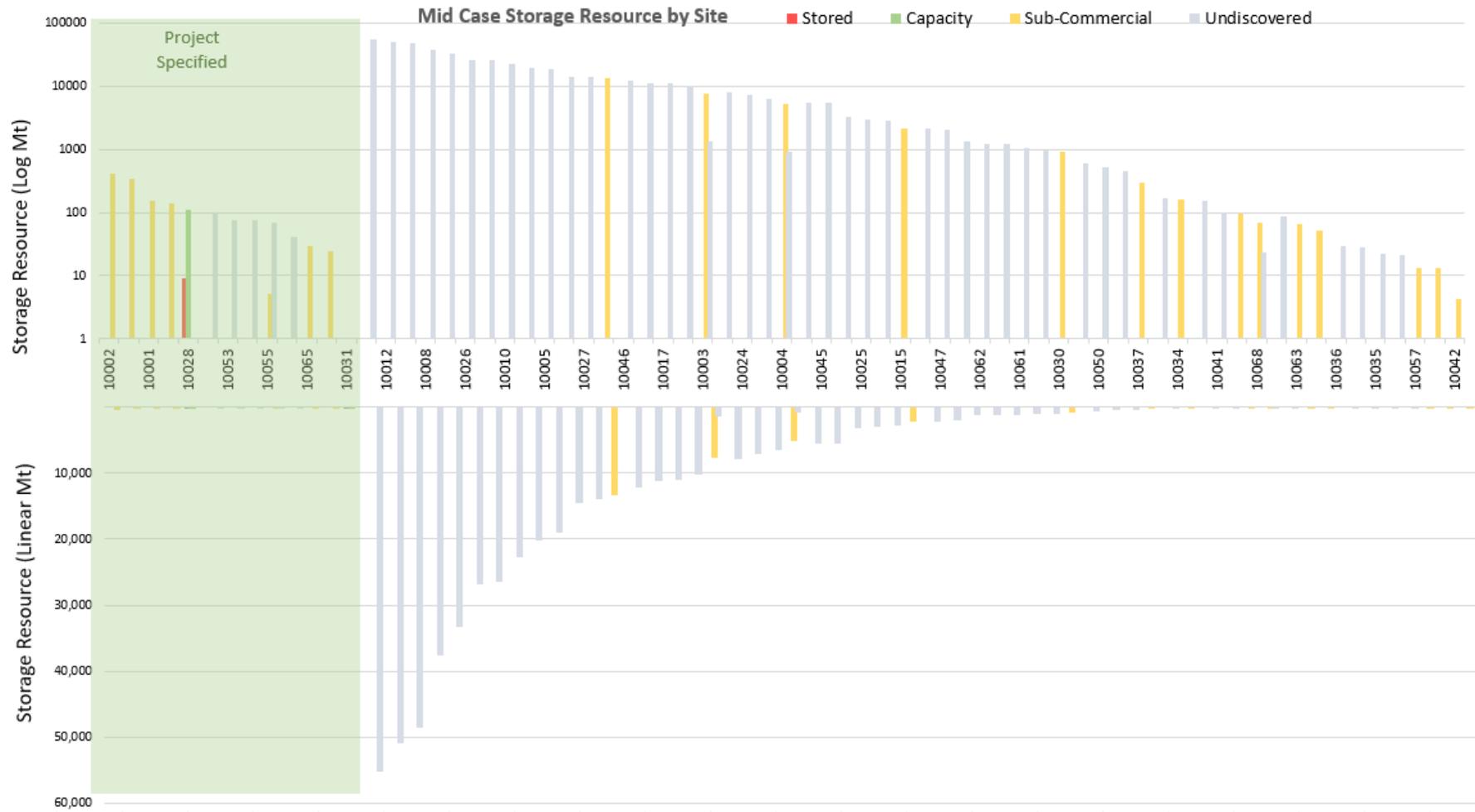


Figure 1-2: Storage resource summary for Australia compiled in the CSRC.

Graph above is log scale and graph below is linear. Green box highlights sites where a project has been specified.

1.3 Evaluation History

The potential CO₂ storage resources of Australia were initially summarised as part of the GEODISC programme of research completed by the Australian Petroleum Cooperative Research Centre, Geoscience Australia and the University of New South Wales in 2004 [1]. The project screened over 300 geological basins down to 48 before some 65 "potentially environmentally sustainable sites for CO₂ injection" (ESSCIs) were identified. This report was at the time a ground-breaking piece of work and one of the first attempts at a regional CO₂ resource evaluation. To navigate the lack of globally published reservoir simulation studies at the time, a "risk based" calculation method was developed. A chance factor was assigned to each potential ESSCI, describing its chance of being capable to deliver a viable development. This ESSCI chance accounted for storage resource, injectivity potential, site details, containment, and existing natural resources. In general, depleted fields had the highest ESSCI chance, followed by structural traps with no hydrocarbons and finally hydrodynamic systems with no structures.

The study concluded that Australia has a potential risked storage resource (ESSCI storage potential x ESSCI Chance factor) of 720 Gt. Whilst the evaluation included the identification of specific formation and seal pairs through regional review and highlighted the significant potential available, the document does not support a useful classification against the SRMS system. Furthermore, the CO₂ storage resource was presented as "Risked Resource" rather than the un-risked resource required by the SRMS.

In 2009, the Carbon Storage Taskforce (CST) compiled the National Carbon Mapping and Infrastructure Plan – Australia on behalf of the Australian Government, which provided the storage resource estimations included in this report [2]. The Taskforce is composed of members from key industry sectors and Governments which have an expertise or interest in CCS. The Plan aims to map both the potential storage resource and carbon sources in Australia to accelerate industrial CCS development. The report considered the storage resource within saline aquifers, petroleum fields and EOR projects. Theoretical, probabilistic storage capacities were calculated for saline aquifers, based on the probability of the resource being able to be utilised. The reported results used a storage efficiency factor (E) of 4%.

The methodology to evaluate the storage within hydrocarbon fields was not defined in the CST report.

Since 2009, the Australian Government has undertaken several research projects on specific sites or basins that are considered priority areas for CCS development in Australia. Of these, two provide storage resource estimations, one for the Gippsland Basin and one for the Petrel Sub-basin [3] [4]. Both these reports use simulation modelling to prove CO₂ containment, built using well and seismic data from nearby hydrocarbon exploration activity. As such, they provide project-based evaluations.

The storage resource potential for Australia was updated in Cycle 2. Cycle 1 data was a limited update of the Cycle 0 dataset which was used to test the SRMS classification process and create the initial version of the CSRC. As much of the data included in this early version was from country-wide and regional basin scale evaluations dated from the Geodisc 2003 [7] and the National Carbon Storage Taskforce 2009 [2] studies, much of the original data have been superseded by studies carried out in the subsequent decade.

The major changes to the resource entries and classification are:

- Refinement of the 'undiscovered' resource in eight basins resulting in a re-classification of 49% of the Basin Play resource to Sequence Play and Lead most of this data was published in Bradshaw et al [5].
- Overall, 40 new sites have been added to the Catalogue, ranging from Sequence Play to Development Unclassified on the SRMS classification. This includes six sites which changed classification and six new Projects.
- 15 new Sub-commercial (Discovered) sites (10 new saline aquifer sites and five new depleted fields).
- Most sites sit within the onshore basins (Bowen, Eromanga, Surat, Galilee, and Perth basins, including depleted fields in Queensland), with the Gippsland, Browse and Bonaparte basins containing offshore potential opportunities.
- Volumes of Stored CO₂ have been updated at the Otway facility and at the large-scale, commercial Gorgon project.

Cycle 2 updated the resource review of Australia using the detailed evaluations of the Queensland-based Zerogen project which looked at storage potential in the Bowen and Surat basins, and the Wandoan project which also evaluated the Surat Basin [6]. Additional studies also evaluated the Eromanga Cooper and Galilee basins. In the Northwest Shelf area, evaluations of the opportunities in the saline aquifers of the Browse and Bonaparte basins offer potential support for the development of the high CO₂ gas field in that area. The SW Hub project has evolved over the past decade and provides refinement of the Perth Basin area resource potential. Resource potential of the onshore and offshore Gippsland Basin and Otway Basin was also updated.

1.4 Resource Review

1.4.1 Major Projects

Overall, The Australian commercial storage resource documented in this report is sourced from two projects: Chevron's Gorgon LNG project and the CO₂CRC Otway Research Facility.

Operating since 2009, Gorgon is an LNG site where naturally occurring CO₂ is separated from

the natural gas before compression. Up to 3.8 Mt/yr is expected to be injected over a 25-year period, and in February 2020, the project surpassed 1 Mt CO₂ injected. A total CO₂ volume of 120 Mt has been approved for injection (M. Trupp, Chevron, pers. comm), representing the expected volume of captured CO₂. A suite of CO₂ injection, water injection and surveillance wells are used in the project to manage CO₂ containment in the Jurassic-age reservoir [7].

The Otway Research Facility was established in 2008 by the Cooperative Research Centre for Greenhouse Gas Technologies (CO₂CRC) under the Australian Government's Cooperative Research Centres (CRC) program. Following the cessation of funding in 2014, the facility now operates as a not-for-profit research centre with the aim of developing CCS injection and monitoring techniques to lower industrial GHG emissions. It has successfully stored 80,000 tonnes of CO₂ and aims to drill up to 5 injection and/or monitoring wells from 2017 onwards [8].

No estimations for the total storage resource potential at either site could be found within the published literature.

The Global CCS Institute has provided updates on several CCS projects in Australia (Global CCS Institute, 2020):

- The Cooper Basin Project has commenced FEED for the 1.7 Mtpa CCS project taking CO₂ produced from the Moomba natural gas processing plant to depleted hydrocarbon fields (via a 50 km pipeline) for storage.
- The Carbon Transport and Storage Company (CTSCo) is planning a demonstration project capturing up to 120,000 T/y CO₂ from a coal-fired power station with storage in the Surat Basin.
- The CarbonNet project (Victoria) has completed appraisal drilling and is developing plans with stakeholders for commercialisation in the future.

1.4.2 Depleted Oil & Gas Fields

The CST [2] reports a total of 16.5 Gt storage potential within Australian depleted hydrocarbon fields. The report does not, however, note the methodology used to calculate this resource.

By definition, all hydrocarbon fields can be classified as discovered. The CST Report [2] notes that in the NW shelf, petroleum activity is currently forecasted to extend beyond 2050 and are therefore considered Discovered Inaccessible storage resources at this time. This holds a total of 13.4 Gt of storage resource.

Outside the NW Shelf, in both offshore and onshore locations, the aggregated storage resource is 3.1 Gt. This portion has been classified as Discovered Development Not Viable, as the resource is not constrained by the Australian regulatory system, however while the storage resource is accessible before the AED of 2050, no sites currently undergoing appraisal were

found during the CSRC Cycle 1.

1.4.3 Saline Aquifers

The saline aquifer resource comprises the largest proportion of potential storage resource in Australia. The majority, 485 Gt of this resource lies at the 'Undiscovered Basin Play' level as no formation has been specified for many of the basin-level evaluations [2]. In the recent projects undertaken by the Australian Government, where a formation was specified, the resource was classified as 'Undiscovered Sequence Play', however this only accounts for 0.4 Gt, highlighting the overall low maturity of the saline aquifer resource [4], [3].

In areas where the reservoir had been discovered through the drilling and logging of hydrocarbon wells, a portion of the site could be classified as 'Discovered Not Viable', calculated as a proportion to the well density.

The total 'Stored' saline aquifer resource is 2 Mt, from the Gorgon and CO₂CRC projects, as detailed in 1.1.4.1.

1.5 Regulatory Framework

CCS legislation in Australia is defined either by the state, or by the Commonwealth, when in Commonwealth Marine Protection Zones. There is currently legislation established covering a number of states and areas in the Commonwealth waters, giving Australia the highest global Legal and Regulatory Indicator rating from the GCCSI [9].

In 2020 the Offshore Petroleum and Greenhouse Storage Act 2006 (OPGGSA) was updated to allow cross-boundary CO₂ injection (i.e., between Commonwealth and state/Territory jurisdictions; [10]. The CST Report notes, however, that the regulation is not consistent between states, particularly in the areas surrounding long-term liability and any pre-existing rights for resource exploitation of specific sites [2].

The CCS-supportive legislation and policy framework in Australia has led to industry CCS operations at Gorgon, in addition to numerous government-backed research facilities and pilot-projects [11]. [10].

1.5.1 Issues for the Assessment

While the National Carbon and Infrastructure Mapping Plan made significant progress in identifying and quantifying CO₂ storage resource in Australia, the report is now more than a decade old and would benefit from modern evaluation, accounting for the significant changes in the CCS industry over the last 10 years and from learnings from the petroleum industry.

There is a risk of double counting in the Bonaparte and Gippsland Basins between the regional, theoretical evaluation made in the National Carbon Mapping and Infrastructure Plan [2] and later studies that considers injection on a local scale into the basins [4] [3]. In accordance with the SRMS guidelines on aggregation of resources, the double counting cannot be avoided as

due to the different maturity of the sites against the SRMS classification system [12].

1.6 Future Updates

1.6.1 Future evaluations

Further work should also focus on evaluation at a site or even formation level, to progress the maturity of the Australian resource along the SRMS classification system.

1.7 Resources booked using SRMS

On 8th Feb 2022 Santos announced that it had booked 100 Mt of CO₂ storage resource in the Cooper Basin in South Australia in its end 2021 reserves statement [13]. The announcement highlighted that it is “a subset of the total prospective storage resource in the Cooper Basin” and noted that it “follows the final investment decision on the 1.7 million tonne per annum Moomba carbon capture and storage (CCS) project in November 2021”. (Note: The Moomba project is not included as a site in the catalogue because insufficient technical data have been published.)

Resource Class	End 2021 Resource Booking
Proved capacity (1P)	6 MtCO ₂
Proved plus probable capacity (2P)	9 MtCO ₂
Contingent resources (2C)	91 MtCO ₂

Table 1-2: Santos Capacity and 2C contingent CO₂ Storage resources as at 31 December 2021 [3]

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2 New Zealand

2.1 Summary

New Zealand was assessed during Cycle 5. The CSRC has identified a CO₂ storage resource for New Zealand as follows:

Classification	CO ₂ storage resource (Gt)	
	Project and no project	Project specified only
Stored	0.000	0.000
Capacity	0.000	0.000
Sub-Commercial	0.429	0.000
Undiscovered	2.470	0.000
Aggregated*	2.899	0.000

* The aggregated resource represents the summed storage resource across all maturity classes and as such should not be viewed as representative of the potential of New Zealand.

Table 2-1: Storage resource classification summary for New Zealand.

- New Zealand was reviewed by a consortium led by Transfield Worley Ltd and included Schlumberger (Australia), WorleyParsons (USA), Baker & McKenzie (Australia), Montgomery Watson Harza (NZ), and CSIRO (Australia). The aim was to identify options for CO₂ storage in geological formations, and technical, commercial, legal, environmental feasibility for CCS projects.
- There is an active hydrocarbon industry in New Zealand and its near depleted oil and gas fields have been identified as potential candidates for CO₂ storage. Deep saline formations within the onshore Canterbury-Otago region have also been identified for storage potential in New Zealand.
- Soon to be depleted oil and gas fields are in the onshore Taranaki basin located in the Taranaki region of New Zealand. Three reservoirs within the Canterbury-Otago Region of the country have promising storage of CO₂
- The Ngawha Geothermal Power Station was the first successful CCS project in New Zealand, while the Kapuni Gas Field project, although uncertain, is expected to kick off by 2027.
- New Zealand intends to legalise CCUS by 2025. Risk assessment, technical factors and engagement with permit holders are the main issues with CO₂ storage in New Zealand.
- New Zealand has a score of 27 on the GCCSI's country's' Legal and Regulatory Indicator system.

A) Project and Non-Project Mid-Case Storage Resource



B) Storage Resource by Type

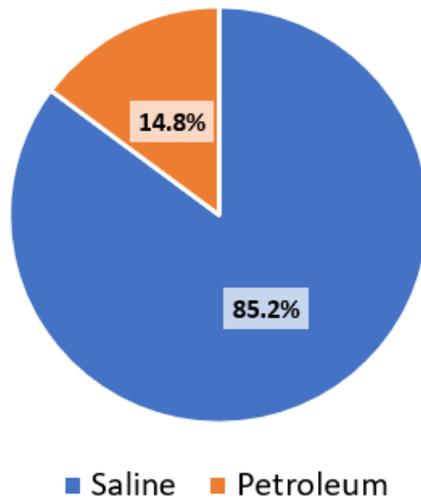


Figure 2-1: New Zealand spread of Storage Sites

A) Spread of storage resource in all New Zealand sites across SRMS classifications; both project specified and not. B) Split of New Zealand storage resources between saline aquifers and hydrocarbon fields, (include both project specified and not specified). Note: due to the large variance in the size of values, numbers in pie plots do not add up to 100.

2.2 Resource Statement



Figure 2-2: Storage resource summary for New Zealand compiled in the CSRC.

The graph above is a log scale, and the graph below is linear. The green box highlights sites where a project has been specified.

2.3 Evaluation History

Early investigations of CCUS in New Zealand can be traced from the 2000's where a consortium of government agencies and leading practitioners (NZCCS Partnership), led by Transfield Worley Ltd started exploring the options of CO₂ storage in geological formations.

This study received funding from the Ministry of Science and Innovation (MSI) through contract TRAN0901, identified by reference number CONT-21185-CCS-TRANSFIELDKAK.

Other members of the consortia included Schlumberger (Australia), WorleyParsons (USA), Baker & McKenzie (Australia), Montgomery Watson Harza (NZ), and CSIRO (Australia).

The main goal of this research was to determine the value proposition of CCS for New Zealand as the country advances into a low-carbon future. The research was aimed to answer questions relating to deployment barriers, identifying knowledge and capability gaps, and lastly to explore possible technical, commercial, legal, environmental and social setbacks requiring solutions for CCS implementation in New Zealand [1].

Research findings suggest that CCS will be very beneficial to New Zealand's low carbon transition, especially when integrated into new projects and for large emitters than for small ones.

The significant factor creating uncertainty in undertaking CCS projects is the financial aspect of it since there are unknown expenses and costs associated with identifying and developing carbon capture sites.

Key challenges with this research included legislative gaps, limited public awareness, limited knowledge of potential carbon storage sites, and future costs in engaging in CCS projects [1].

2.4 Resource Review

While New Zealand possesses some capacity for carbon storage in saline aquifers, most of its identified potential storage sites are near depleted oil and gas reservoirs in the onshore Taranaki basin [3]. Deep saline formations onshore Canterbury-Otago region of the South Island, New Zealand [4] offer some additional potential.

2.4.1 Major Projects

The Ngawha Geothermal Power Station has become the nation's first geothermal power plant to achieve the net carbon zero status. This success is attributed to the hard work of Top Energy which implemented the complete reinjection of non-condensable gases, which resulted in a massive reduction in emissions from 128,000 tons of CO₂ to ~28,000 [2].

Kapuni gas field owner, Top Energy intends to capture CO₂ from industrial processes at the Kapuni gas field in Taranaki and reinject it deep underground. The intended start date for this project is around 2027 to meet the government's legal obligations to cut emissions of CO₂ by 2030. However, the future of this project is uncertain due to economic factors [5].

2.4.2 Depleted Oil & Gas Fields

Three major fields within the Taranaki basin have been identified as potential options for CCS.

The main identified potential CO₂ storage sites lie in the depleted Maui petroleum field (offshore) and Kapuni gas field (onshore). The Maui petroleum field which is New Zealand's largest discovered field so far has storage capacity of approximately 300 Mt while the Kapuni gas field which is the largest and oldest producing onshore fields and has the best characteristics for CO₂ storage has capacity of approximately 100 Mt. Thirdly, the Mckee field located in the onshore Taranaki basin has storage capacity of 23 Mt [3]. These fields are near depleted fields as at the time of assessment with uncertain full depletion dates.

The Maui field lies adjacent to an active fault, the Cape Egmont Fault, but its offshore position somewhat mitigates risks associated with possible leakage from fault activity.

Again, considering the Kapuni field, produced gas from the field contains a high proportion of CO₂ (c. 45%), which may mitigate unforeseen problems upon re-injecting the same gas into the field, provided that the initial reservoir pressures are not exceeded and provided the reservoir can be re-pressurised without breaching the seal.

Although many other oil and gas fields possess some degree of suitability for storage of CO₂, offshore locations offer the best and most promising long-term storage solutions. The effectiveness of the top seal is proven given the containment of hydrocarbons. However, the structural complexity and resulting thickness variations in the region will result in uncertainties associated with the calculation of storage capacity, and risk associated with potential leakage [3].

The Mangahewa gas field has a CO₂ storage capacity of c. 8 Mt, based on known reserves, although the field's size is still under review.[3]

Considering other fields in the onshore Taranaki basin, deep reservoirs of more than 3000m depths increases the costs of drilling and compression of gas for injection. On the other hand, some fields like Kaimiro/Ngatoro, Goldie and Windsor are relatively shallower reservoirs (1000-2000 m) [3].

While several onshore fields like TAWN (Tariki, Ahuroa, Waihapa, Ngaere), Mangahewa, Kaimiro/Ngatoro, Goldie, Windsor, Surrey, Cheal, Radnor fields, and Pohokura field could be considered for future storage, several factors affect their immediate potential. While some are ongoing producing fields, others have small sizes and an uncertain lifespan to depletion. Regardless of the said factors, they may be viable for small pilot CO₂ injection projects [3].

2.4.3 Saline Aquifers

Deep saline aquifers within the onshore Canterbury-Otago region of the South Island of New Zealand hosts some potential of CO₂ storage [4].

Three suitable reservoir units have become buried sufficiently since the Miocene [7] to store supercritical CO₂. The oldest reservoir comprises Upper Cretaceous to Paleocene fluvial,

estuarine, and marine sandstones of the Broken River Formation (BRF) and Conway Formation (CF) [8].

The BRF and CF reservoir have storage capacities of 810 Mt at 1% storage efficiency.

The second reservoir comprises the Charteris Bay Sandstone (CBS) and the Waipara Greensand (WG) also has a storage potential of 510 Mt at 1% storage efficiency.

The final reservoir is the Homebush Sandstone (HS), a mature shelf sand with locally excellent poro-perm properties [7] can also accommodate 1150Mt of injected CO₂ at same storage efficiency (1%)

2.5 Regulatory Framework

In New Zealand's bid to consider CO₂ storage as part of low-carbon future, earlier this year (2025), the New Zealand coalition government begun a consultation process for a planned regulatory framework designed for carbon capture, utilization and storage (CCSU). A proposal within the framework is to offer New Zealand emissions units (NZUs) to operators of CCSU projects [6].

At the time of this Cycle 5 assessment, the planned legal framework had not been passed.

In the meantime, many other laws may apply at different stages of a CCS project e.g., the Crown Minerals Act 1991, the Continental Shelf Act 1964, and the Marine and Coastal Area (Takutai Moana) Act 2011, the Climate Change Response Act 2008, the Building Act 2004, and the Gas Act 1992.

2.6 Issues for the Assessment

Sufficient research does exist in New Zealand to indicate that potential opportunities are present for storage projects in the country. To mature these however, there will need to be a much greater level of technical work, risk assessment and engagement with the petroleum industry. In addition, a limiting factor for the current assessment is the lack of research to mature the sites to a project status. In addition, there is an absence of published dynamic simulations which if available, would provide a greater confidence level on resource estimates.

2.7 Future Updates

2.7.1 Future CRSC Cycles

The structural complexity and resulting thickness variations in the region have caused uncertainties of storage capacity calculations, and risk associated with potential leakage [3]. Future updates should seek to see if there are further assessments addressing this.

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3 Pacific Island Countries

3.1 Summary

The Pacific Islands of Fiji, Kiribati, The Marshall Islands, Micronesia, Nauru, Papa New Guinea, Palau, Samoa, The Solomon Islands, Tonga, Tuvalu and Vanuatu were assessed during Cycle 5. These countries in the Pacific Island group above are reported as having no CO₂ geological storage resources.

Classification	CO ₂ storage resource (Gt)	
	Project and no project	Project specified only
Stored	0.000	0.000
Capacity	0.000	0.000
Sub-Commercial	0.000	0.000
Undiscovered	0.000	0.000
Aggregated*	0.000	0.000

* The aggregated resource represents the summed storage resource across all maturity classes and as such should not be viewed as representative of the potential of Micronesia.

Table 3-1: Storage resource classification summary for the Pacific Island group of Fiji, Kiribati, The Marshall Islands, Micronesia, Nauru, Papa New Guinea, Palau, Samoa, The Solomon Islands, Tonga, Tuvalu and Vanuatu.

3.2 Fiji

3.2.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Fiji has sites suitable for geological storage of CO₂. As part of a volcanic Island arc, with limited sedimentary formations, Fiji does not have suitable geology for deep geological storage of CO₂.

Fiji has a climate strategy that includes carbon sequestration via nature-based solutions such as an increase in native vegetation, conservation of biodiversity and increase reforestation [1].

3.2.2 Regulatory Framework

Fiji does not currently have any regulatory framework for geological storage of CO₂.

3.2.3 Future Updates

Due to a lack of suitable geology, low emissions and preference to nature-based CO₂ sequestration, Fiji will unlikely need future updates.

3.3 Kiribati

3.3.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Kiribati

has sites suitable for geological storage of CO₂. As part of a low-lying coral atoll built on a volcanic chain, there are limited sedimentary formations, and as such Kiribati does not have suitable geology for deep geological storage of CO₂. Kiribati has a climate strategy that includes carbon sequestration via nature-based solutions such as an increase in native vegetation, conservation of biodiversity and increase reforestation [2].

3.3.2 Regulatory Framework

Kiribati does not currently have any regulatory framework for geological storage of CO₂.

3.3.3 Future Updates

Due to a lack of suitable geology, low emissions and preference to nature-based CO₂ sequestration, Kiribati will unlikely need future updates.

3.4 Marshall Islands

3.4.1 Evaluation History

There are no published reports or research at a federal or academic level to support that The Marshall Islands have sites suitable for geological storage of CO₂. As part of a volcanic island seamounts capped by coral reefs, The Marshall Islands do not have suitable geology for deep geological storage of CO₂. The Marshall Islands have a climate strategy that includes carbon sequestration via nature-based solutions such as seagrass and increase in native vegetation [3].

3.4.2 Regulatory Framework

The Marshall Islands does not currently have any regulatory framework for geological storage of CO₂.

3.4.3 Future Updates

Due to a lack of suitable geology, low emissions and preference to nature-based CO₂ sequestration, The Marshall Islands will not need future updates.

3.5 Micronesia

3.5.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Micronesia has areas sites for geological storage of CO₂. The geology of the country is unsuitable for CO₂ being characterized by a mix of volcanic islands and coral atolls. Micronesia has a climate strategy that includes carbon sequestration via nature-based solutions such as an increase in native vegetation, conservation of biodiversity and increase reforestation [4].

3.5.2 Regulatory Framework

Micronesia does not currently have any regulatory framework for geological storage of CO₂.

3.5.3 Future Updates

Due to a lack of suitable geology Micronesia will not need future updates.

3.6 Nauru

3.6.1 Evaluation Summary

There are no published reports or research at a federal or academic level to support that Nauru has areas sites for geological storage of CO₂. Nauru is the third smallest country in the world by area and population (21 km², ~13,000) [1]. Due to the size, infrastructure, unsuitable geology and economy, geological storage is unlikely to be a consideration for this country.

Nauru has published NDC's, although carbon sequestration of any sort is not currently a part of them [1].

3.6.2 Regulatory Framework

Nauru does not currently have any regulatory framework for geological CCS.

3.6.3 Future Updates

Due to a lack of suitable geology Nauru will unlikely need future updates.

3.7 Palau

3.7.1 Evaluation Summary

There are no published reports or research at a federal or academic level to support that Palau has sites suitable for geological storage of CO₂. As part of a volcanic Island arc, with uplifted coral islands, Palau does not have suitable geology for deep geological storage of CO₂. Palau has signed the Paris Agreement and has set out its strategy to reduce emissions. Palau is considering CO₂ sequestration via blue carbon and improving coastal ecosystems to [6].

3.7.2 Regulatory Framework

Palau does not currently have any regulatory framework for geological CCS.

3.7.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, Palau will not need future updates.

3.8 Papua New Guinea

3.8.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Papua New Guinea has sites suitable for geological storage of CO₂. Despite having an active hydrocarbon industry (mainly gas) there have been no identified storage sites in depleted or near depleted oil and gas fields.

Papua New Guinea has a climate strategy that includes carbon sequestration via nature-based solutions such as an increase in native vegetation, conservation of biodiversity and increase

reforestation [7].

3.8.2 Regulatory Framework

Papua New Guinea does not currently have any regulatory framework for geological CCS.

3.8.3 Future Updates

Future updates could seek to gain updates on any potential storage research for depleted hydrocarbon reservoirs.

3.9 Samoa

3.9.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Samoa has sites suitable for geological storage of CO₂. Samoa was formed due to volcanic hot spot activity and composed predominantly of alkalic volcanic material. There are also recent submarine eruptions in the area. As such the geology of Samoa is unsuitable for CO₂ storage.

Samoa has a climate strategy that includes carbon sequestration via nature-based solutions such as an increase in native vegetation, conservation of biodiversity and increase reforestation [8].

3.9.2 Regulatory Framework

Samoa does not currently have any regulatory framework for geological CCS.

3.9.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, Samoa will not need future updates

3.10 Solomon Islands

3.10.1 Evaluation History

There are no published reports or research at a federal or academic level to support that the Solomon Islands have sites suitable for geological storage of CO₂. The Solomon Islands are a chain of mountainous volcanic islands which renders the geology unsuitable for CO₂ storage.

The Solomon Islands is considering biomass CO₂ sequestration via forestry [9].

3.10.2 Regulatory Framework

The Solomon Islands does not currently have any regulatory framework for geological CCS.

3.10.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, the Solomon Islands will not need future updates

3.11 Tonga

3.11.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Tonga has sites suitable for geological storage of CO₂. Tonga's geology is characterised by active volcanism and uplifted coral limestone, and as such the geology of is unsuitable for CO₂ storage.

Tonga is considering biomass CO₂ sequestration via forestry [10].

3.11.2 Regulatory Framework

Tonga does not currently have any regulatory framework for geological CCS.

3.11.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, Tonga will not need future updates

3.12 Tuvalu

3.12.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Tuvalu has sites suitable for geological storage of CO₂. Tuvalu's geology is characterised by low-lying coral atolls and reef islands formed on a volcanic archipelago and as such the geology of is unsuitable for CO₂ storage. Tuvalu is considering biomass CO₂ sequestration via forestry [11].

3.12.2 Regulatory Framework

Tuvalu does not currently have any regulatory framework for geological CCS.

3.12.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, Tuvalu will not need future updates

3.13 Vanuatu

3.13.1 Evaluation History

There are no published reports or research at a federal or academic level to support that Vanuatu has sites suitable for geological storage of CO₂. Vanuatu geology is part of the Pacific Ring of Fire and also part of one of the most active subduction zones on earth making it vulnerable to both earthquakes, volcanic eruptions and tsunamis. As such the geology is unsuitable for CO₂ storage. As a densely forested nation, Vanuatu is currently in a net negative emissions position [12].

3.13.2 Regulatory Framework

Vanuatu does not currently have any regulatory framework for geological CCS.

3.13.3 Future Updates

Due to a lack of suitable geology and preference to nature-based CO₂ sequestration, Vanuatu

will not need future updates

3.14 References

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