



STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 10

DATE		LOCATION	
11 April 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 10		8:03am	10:25am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES			
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	

Strategic Fleet Taskforce Minutes – Meeting 10

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 9 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 10 of the Taskforce.
2. **Agreed** to the Taskforce Minutes of Meeting 9 – 28 March 2023.

- The Chair welcomed members to the tenth meeting of the Strategic Fleet Taskforce.
- Members agreed to the Taskforce Minutes of Meeting 9, subject to clarification of suggested amendments by Mr Crumlin.
- Members noted progress of the Rolling Action Items.

Agenda Item 2: Discuss GHD's Analysis of international fleet and requisitioning models.

The Strategic Fleet Taskforce:

1. **Agreed** to discuss GHD's report on International Strategic Fleet Models and domestic requisitioning arrangements at the next meeting.
- The GHD report was not available for this meeting.
 - The GHD report will be circulated out of session for members' comment.

Action Item 1: The Secretariat to provide GHD's analysis of international fleet models and domestic requisitioning arrangements out of session.

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Agenda Item 5: Discuss initial draft structure of the final report

The Strategic Fleet Taskforce:

1. **Considered** the proposed draft structure for the Taskforce's final report and advised the Secretariat of changes.
2. **Agreed** on the draft structure, with changes being incorporated.

- Members noted the draft outline of the final report which the Taskforce is required to deliver to Government by 30 June 2023.
- The final report will include the options identified by the Taskforce, supporting evidence, stakeholder views, and Taskforce's recommendations.
- The Department sought advice from members on the structure, format and approach prior to commencing the drafting of the final report.
- The Department noted the draft report will be provided to the Taskforce in a staggered way over the next two months for assessment and consideration, noting the Chapters on strategic fleet and requisitioning will be brought back to Meeting 11 for Taskforce consideration.
- The Chapters on maritime workforce and other measures will be provided to members the first week in May.
- Mr Crumlin made a number of suggestions as to the structure of the report and agreed to circulate his specific comments after the meeting.
- Members agreed that when drafting of the final report it should be assumed that the report may be made public and therefore needed to be drafted accordingly.
- Members noted the report would demonstrate the broad coverage of considerations the taskforce had made in preparation of the final report. Noting this is an opportunity to fundamentally change the attractiveness of the Australian

register and by providing advice on strategic shipping, we rebuild the shipping industry.

- Members discussed the structure of the final report including positioning of specific content, consideration of training and workforce issues, incorporation of stakeholder views, characteristics needed for requisitioning capability, ensure that any concerns that may be raised are addressed, and how some options can be stacked together.

Action Item 5: Mr Crumlin to provide his feedback on the structure of the draft report to the Department.

Action Item 6: Department to continue drafting the final report in the current structure reflecting the conversation of the meeting.

Agenda Item 6 – Stakeholder Consultation – outcomes and next steps

The Strategic Fleet Taskforce:

1. **Noted** the summary of key themes and issues raised during the one-on-one consultation meetings and the summary of submissions.
 2. **Agreed** next steps for stakeholder consultation.
-
- Members agreed to discuss recommendations with one or two key stakeholders to ensure the taskforce views are on track and relevant.
 - The Chair advised that he would make himself available for these meetings.

Action Item 7: Department to distribute to members an implementation plan of the third consultation options and timings and to work with members to meet the timeframe.

Agenda Item 7: Taskforce Discussion – Next Steps

The Strategic Fleet Taskforce:

1. **Agreed** on what steps are needed before the next meeting of the Taskforce.
-
- Members noted the first iterations of draft report chapters will be provided for Meeting 11, 24 April 2023.
 - The Department advised members that the workforce report Census survey response rate is not strong with GHD following up key stakeholders to obtain responses to the Census to enable a suitable response sample for reporting purposes.

Action Item 8: The Department to send out GHD's report on International Strategic Fleet Models and domestic requisitioning arrangements to members out of session.

Action Item 9: Members to provide any additional advice to the department on the outline of the final report.

Action Item 10: Department to contact Dr Sarah Ryan to obtain her comments on the outline of the report.

Agenda Item 8: Other Business, Meeting Schedule and Next Meeting

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
 2. **Confirmed** the next meeting will be held virtually on Monday 24 April 2023 commencing at 9:00am
 3. **Agreed** to the schedule of meetings in May and June.
 4. **Noted** the updated Scope of Meetings.
-

- Members discussed the final schedule for meetings.
 - Members agreed to schedule an additional one-hour meeting commencing 7.30am on Friday 12 May 2023.
 - Members agreed to the following meeting schedule:
 - Meeting 11 – 24 April 2023 (9am-12pm)
 - Meeting 12 – 12 May 2023 (7:30am-8:30am)
 - Meeting 13 – 19 May 2023 (9am-1pm)
 - Meeting 14 – 1 June 2023 (9am-1pm)
 - Meeting 15 – 13 June 2023 (9am-1pm)
 - Members noted an FOI request had been lodged by Mr Rex Patrick for the Taskforce meetings minutes and the interim report.
 - Members were advised that the department is assessing the request against the FOI guidelines and will provide further advice to members once that process has been completed.
 - Members noted that prior to a decision, the department will liaise with members to seek additional comments.
-

Action Item 11: The Secretariat to schedule the remainder of the Taskforce meetings in members calendars.

Agenda Item 9: Meeting Closure

The meeting closed at 10:25am.

s22(1)(a)(ii)



STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 11

DATE		LOCATION	
24 April 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 11		9:04am	10:25am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Nil	

Strategic Fleet Taskforce Minutes – Meeting 11

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 10 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 11 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 10 – 11 April 2023.
-
- The Chair welcomed members to the 11th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 10, subject to the following comments raised by Mr Crumlin.
 - The final draft of the final report outline was not circulated to members.
 - Mr Crumlin sought advice if the final report was going to be made public.
 - Members noted progress of the Rolling Action Items.

Action Item 1: The Department will incorporate members comments on the final draft of the final report in due course.

Agenda Item 2: Discuss advice on the costs and impacts of specific Strategic Fleet scenarios and fleet composition.

The Strategic Fleet Taskforce:

1. **Discussed** GHD's Draft Report 3 – Costs and impacts of specific strategic fleet options/scenarios.

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Agenda Item 4: Discuss First Draft Final Report Chapter on Requisitioning

The Strategic Fleet Taskforce:

1. **Discussed** the draft chapter on requisitioning and provided feedback to the Department.
2. **Discussed** the Taskforce's advice and recommendations relating to this Chapter.

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Agenda Item 5: Stakeholder Consultation

The Strategic Fleet Taskforce:

1. **Agreed** which stakeholders to invite to focused one-on-one consultations.
 2. **Agreed** to a timeline for undertaking the one-on-one consultations.
-
- Members agreed the Department schedule one-on-one consultation sessions with key stakeholders between 22-31 May 2023.
 - Members agreed ANL, Stolt, Depth Logistics, ASP, CSL, Inco, TeeKay and Viva should be asked to participate in the final one-on-one consultation sessions.
-

Action Item 6: Members to confirm their availability before 5 May 2023, to attend one-on-one consultation sessions during the week 22-31 May 2023.

Action Item 7: The Department to distribute a draft timetable for one-on-one consultation session to members for their consideration.

Agenda Item 6: Taskforce Discussion – Next Steps

The Strategic Fleet Taskforce:

1. **Agreed** on what steps are needed before the next meeting of the Taskforce.
-
- Members noted the next meeting is scheduled for one hour and will focus on the first draft of the final report chapter on workforce and training.

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Action Item 8. The Department to distribute to members the draft chapter on other measures/recommendations prior to Meeting 12 which is scheduled for 12 May 2023.

Agenda Item 7: Other Business, Meeting Schedule and Next Meeting

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
 2. **Confirmed** the next meeting will be held virtually for one hour on Friday 12 May 2023 commencing at 7.30am.
-
- Members noted the following items will be discussed at Meeting 13.
 - Updated drafts of the final report chapter's on establishing the Strategic Fleet and Requisitioning.
 - Redraft of the final report on establishing the strategic fleet.
 - The Chapter on other measures will be discussed at Meeting 13 if there is no time to discuss this paper as part of Meeting 12.
 - The overarching final report from GHD is expected to be available for discussion.
 - The first cut of the census results will be discussed.
-

Agenda Item 8: Meeting Closure

The meeting closed at 10:25am.

s22(1)(a)(ii)





STRATEGIC FLEET TASKFORCE

Draft Strategic Fleet Taskforce Minutes – Meeting 12

DATE		LOCATION	
12 May 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 12		7:33am	8:33am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Nil	

Draft Strategic Fleet Taskforce Minutes – Meeting 12

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 11 and Action Items

The Strategic Fleet Taskforce:

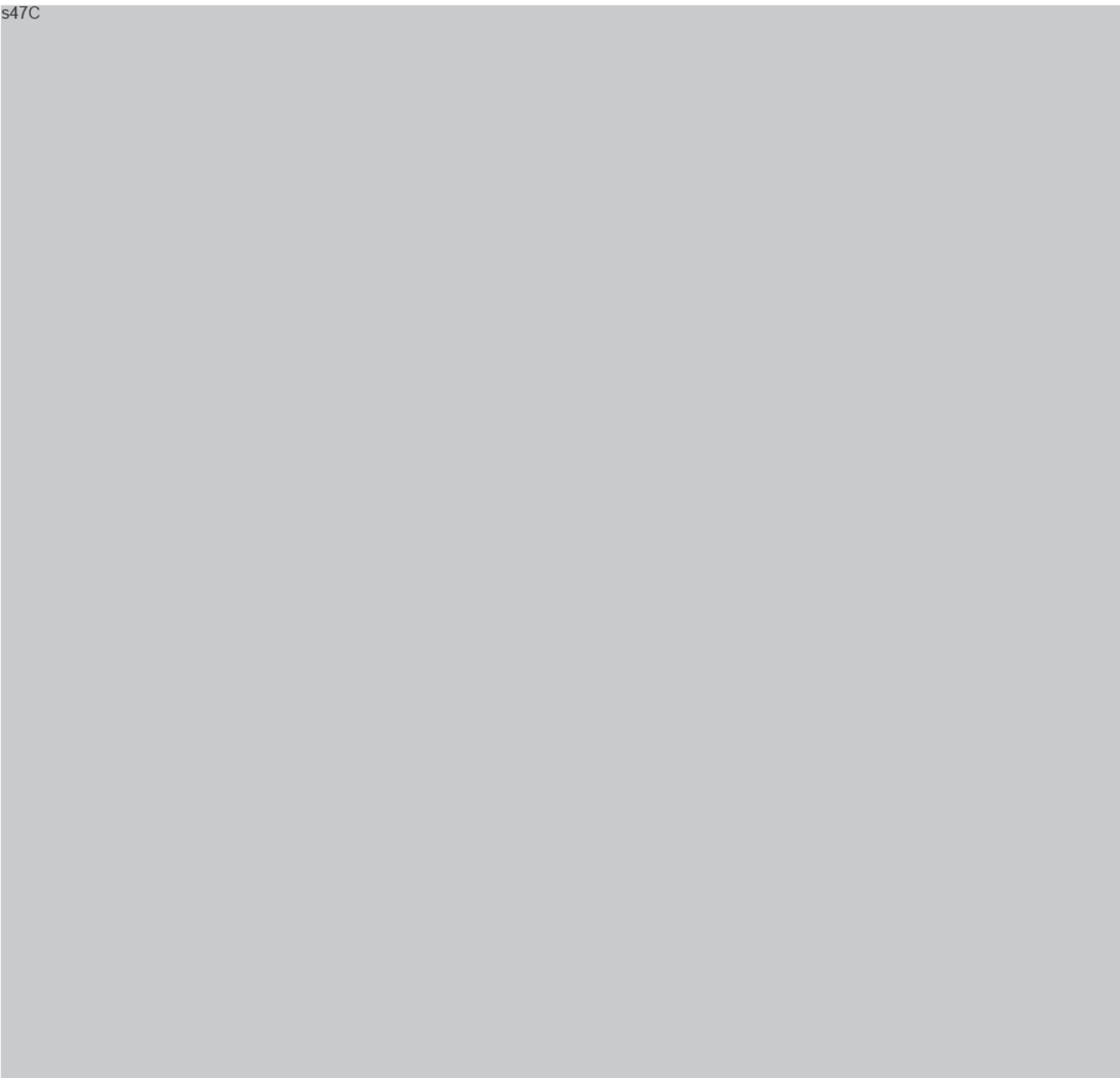
1. **Agreed** to the draft agenda for Meeting 12 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 11 – 24 April 2023.
-
- The Chair welcomed members to the 12th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 11.
 - Members noted progress of the Rolling Action Items.

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Agenda Item 4: Meeting Closure

The meeting closed at 8:33am.

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STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 13

DATE		LOCATION	
19 May 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 13		09:02am	12:42pm
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Nil	

Strategic Fleet Taskforce Minutes – Meeting 13

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 11 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 13 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 12 – 12 May 2023.
- The Chair welcomed members to the 13th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 12.
 - Members noted progress of the Rolling Action Items.

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Agenda Item 3: Update on Stakeholder Consultation

The Strategic Fleet Taskforce:

1. **Agreed** the recommended schedule for a final round of one-on-one consultation.
 2. **Noted** the Department will provide a consultation aid based on the Taskforce's recommendations out of session, after comments on the draft final report are provided.
-
- The Department confirmed the final round of one-on-one consultation will take place on 30 and 31 May 2023.
 - Members noted six of the eight companies approached to participate have responded with the Department following up the remaining two.
 - Following receipt of the Taskforce's comments, a summary of the recommendations will be provided for discussion with key stakeholders during one-on-one sessions.
-

Action Item 3: Department to distribute a consultation aid based on the Taskforce's final recommendations out of session.

Action Item 4: The Department to distribute a schedule of meetings to members followed by meeting invites for the one-on-one consultations.

Action Item 5: The Department to schedule a discussion on stakeholder feedback at the next Taskforce meeting scheduled for 1 June 2023.

Agenda Item 4: Taskforce - Next Steps

The Strategic Fleet Taskforce:

Agreed on what steps are needed before the next meeting of the Taskforce.

- Members noted the next meeting will focus on the final drafting of the report and the initial consultation findings.

Agenda Item 5: Other Business Meeting schedule and Next Meeting

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
2. **Confirmed** the next meeting will be held virtually on Thursday 1 June 2023 commencing at 9:00am.

Agenda Item 6: Meeting Closure

The meeting closed at 12:42pm.

s22(1)(a)(ii)



STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 14

DATE		LOCATION	
1 June 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 14		09:04am	1:05pm
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Nil	

Strategic Fleet Taskforce Minutes – Meeting 14

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 11 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 14 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 13 – 19 May 2023.
-
- The Chair welcomed members to the 14th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 13.
 - Members noted progress of the Rolling Action Items.

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Agenda Item 3: Stakeholder Consultation Feedback

Due to time constraints the Strategic Fleet Taskforce were not able to discuss this agenda item.

Action Item 2: Department to seek advice from members on the Taskforce's preferred approach to engaging with Viva Energy.

Agenda Item 3: Taskforce – Next Steps

The Strategic Fleet Taskforce:

1. Agreed on what steps are needed before the next meeting of the Taskforce.
- Members noted the next meeting will focus on the final drafting of the report and the consultation findings.

Agenda Item 4: Other Business and Next Meeting

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
2. **Confirmed** the next meeting will be held virtually on Tuesday 13 June 2023 commencing at 9am.

Agenda Item 5: Meeting Closure

The meeting closed at 1:05pm.



STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 15

DATE	LOCATION		
13 June 2023	Virtual Meeting – Microsoft Teams		
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 15		09:06am	11:22am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Major General Jason Walk, Member – Strategic Fleet Taskforce	

Strategic Fleet Taskforce Minutes – Meeting 15

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 14 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 15 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 14 – 1 June 2023.
-
- The Chair was delayed in joining at the meeting, so Sarah Ryan stood in as Chair and welcomed members to the 15th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 14.
 - Members noted progress of the Rolling Action Items.
 - The Chair joined the meeting at 9:16am.

Agenda Item 2: Stakeholder Consultation Outcomes

The Strategic Fleet Taskforce:

1. **Discussed** the advice provided by stakeholders during the consultation meetings.
 2. **Noted** the Department has reflected key stakeholder advice in the final report.
 3. **Were asked to advise** the Department of any other stakeholder advice that should be reflected in the final report.
 4. **Agreed** the Taskforce would arrange to consult with Viva Energy.
-
- Members discussed the feedback received from stakeholders during the consultations held on 30 and 31 May 2023, including the implications for the vessel types that might comprise the fleet and the desired characteristics of the process to select ships for the fleet that should include an appropriate transparent and competitive process.

Action 1: The Department to arrange a consultation session for the Taskforce to meet with Viva Energy.

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Agenda Item 4: FOI Update

The Strategic Fleet Taskforce:

1. Noted the update from the Department on the Freedom of Information (FOI) request from Mr Rex Patrick dated 30 March 2023.
-
- Members noted following third party consultation, the Department had provided a response to Mr Rex Patrick on 26 May 2023.
 - Members were advised ten documents were relevant to the request with partial access to the Minutes of Meetings 1-9 being granted and access to the Interim Report not granted.
-

Agenda Item 5: Taskforce – Next Steps

The Strategic Fleet Taskforce:

1. **Agreed** on what steps are needed to achieve the Taskforce's deliverables within the timeframe.

Agenda Item 6: Other Business and Next Meeting

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
 - Members agreed to meet to review the revised version of the final report to Government on Monday 19 June 2023 from 9:00am to 10:30am

Action 3: The Secretariat to schedule the next meeting of the Taskforce on Monday 19 June 2023 commencing at 9:00am concluding at 10:30am.

Agenda Item 7: Meeting Closure

The meeting closed at 11:22am.

s22(1)(a)(ii)



STRATEGIC FLEET TASKFORCE

Strategic Fleet Taskforce Minutes – Meeting 16

DATE		LOCATION	
19 June 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 16		09:02am	10:21am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Major General Jason Walk		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		NIL	

Strategic Fleet Taskforce Minutes – Meeting 16

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 15 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 16 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 15 – 13 June 2023.
-
- The Chair welcomed members to the 16th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 15.
 - Members noted progress of the Rolling Action Items.

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Agenda Item 3: Other Business

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.

- Members agreed to meet to review the final revised version of the final report if necessary.

Action 3: The Department to schedule a tentative meeting for the Strategic Fleet Taskforce for Friday 23 June 2023.

Agenda Item 4: Meeting Closure

The meeting closed at 10:21am.

s22(1)(a)(ii)



STRATEGIC FLEET TASKFORCE

Draft Strategic Fleet Taskforce Minutes – Meeting 17

DATE		LOCATION	
23 June 2023		Virtual Meeting – Microsoft Teams	
MEETING TITLE		START TIME	END TIME
Strategic Fleet Taskforce – Meeting 17		09:04am	09:36am
MEETING ATTENDEES			
Name		Organisation	
Mr John Mullen		Chair – Strategic Fleet Taskforce	
Dr Sarah Ryan		Member – Strategic Fleet Taskforce	
Ms Angela Gillham		Member – Strategic Fleet Taskforce	
Mr Paddy Crumlin		Member – Strategic Fleet Taskforce	
Mr Andrew Johnson		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
s22(1)(a)(ii)		Department of Infrastructure, Transport, Regional Development, Communication and the Arts	
ATTENDEE APOLOGIES		Major General Jason Walk, Member – Strategic Fleet Taskforce	

Draft Strategic Fleet Taskforce Minutes – Meeting 17

Agenda Item 1: Welcome, Acceptance of Draft Agenda, Minutes of Meeting 16 and Action Items

The Strategic Fleet Taskforce:

1. **Agreed** to the draft agenda for Meeting 17 of the Taskforce.
 2. **Agreed** to the Taskforce Minutes of Meeting 16 – 19 June 2023.
-
- The Chair welcomed members to the 17th meeting of the Strategic Fleet Taskforce.
 - Members agreed to the Taskforce Minutes of Meeting 16.
 - Members noted progress of the Rolling Action Items.

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Agenda Item 3: Next Steps Other Business

The Strategic Fleet Taskforce:

1. **Noted** other business raised during the meeting.
2. **Confirmed** arrangements for finalising the Strategic Fleet Taskforce's Report to Government.

- Members discussed the next steps and the process of lodging the final report to the Minister.
- Members sought clarity around publication of consultant reports and other analysis provided to the Taskforce to inform considerations.
- Members noted the requirement for Members' confidentiality to continue with regard to the final report and the work of the Taskforce while the Government considers the report.
- Members noted a covering letter from Mr Mullen to the Minister is currently under draft and the Department is discussing next steps with the Minister's Office.
- Members noted GHD's final reports will be circulated shortly.
- Members acknowledged and thanked everyone for their contribution and hard work.

Action Item 4: The Department to provide Members with talking points summarising the next steps and suitable responses to any questions Members may be asked between now and the response by Government to the Final Report.

Agenda Item 4: Meeting Closure

The meeting closed at 9:36am.

s22(1)(a)(ii)

Strategic Maritime Fleet Report: Australia's Shipping Industry – Work Paper A

DITRDCA

December 2022

Disclaimer

"This report is not intended to be used by anyone other than Department of Infrastructure, Transport, Regional Development, Communications and the Arts.

We prepared this report solely for the Maritime Strategic Fleet Taskforce's use and benefit in accordance with and for the purpose set out in our engagement letter with Department of Infrastructure, Transport, Regional Development, Communications and the Arts dated 21/11/22. In doing so, we acted exclusively for Maritime Strategic Fleet Taskforce and considered no-one else's interests.

We accept no responsibility, duty or liability:

- to anyone other than the Maritime Strategic Fleet Taskforce in connection with this report
- to the Maritime Strategic Fleet Taskforce for the consequences of using or relying on it for a purpose other than that referred to above.

We make no representation concerning the appropriateness of this report for anyone other than Strategic National Fleet Taskforce. If anyone other than the Maritime Strategic Fleet Taskforce chooses to use or rely on it they do so at their own risk.

This disclaimer applies:

- to the maximum extent permitted by law and, without limitation, to liability arising in negligence or under statute; and
- even if we consent to anyone other than the Maritime Strategic Fleet Taskforce receiving or using this report.

Liability limited by a scheme approved under Professional Standards legislation"

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A strategic fleet will need to be both modern and provide the capability to foster more innovative advancements in the Australian Maritime logistics industry.	13

A. Describing Australia's Shipping Industry

Historical Context: Commerciality of the Strategic Maritime Fleet

The recent decision of the Federal Government to invest in a strategic maritime fleet presents an opportunity to examine areas of the shipping trade where a strategic fleet of vessels may be commercially viable and address gaps in the current environment; and also the associated regulatory, infrastructure and training requirements to support this endeavour.

There are lessons to be learned from past experience. The transition to privatisation of Australian shipping during the 1980s and 1990s reflected the broader influence of economic rationalist policies at that time and inefficiencies in the model of public ownership. The Australian National Line (ANL) which took over management of the fleet managed by the Australian Shipping Board (ASB) in 1957 experienced issues in governance and commercial performance from the mid-70s, despite successes in cargo freight from the period between 1960 to the early 1970s. Following progressive restructures, the majority of ANL's shipping business was sold to the French shipping company CGM in 1998, with remaining assets also packaged for sale.¹

How Does the Shipping Industry Broadly Support Australian Social and Economic Interests?

The decision to invest in a strategic fleet provides an opportunity to capitalise on many of the benefits of shipping, which are critical to the Australian economy. The maritime industry has an estimated annual revenue of \$5.76B and added approximately \$2.03B to the Australian economy in 2020-21.²

Further, Australia is the fifth largest user of shipping services in the world, and more than 99% of Australia's trade volume is transported via sea, with up to 80% of economic trade value. Up to 20% of Australian GDP³ is dependent on international shipping, however, only 15% of Australia's domestic freight task is currently moved by shipping.⁴ This is despite the following benefits of shipping vs other forms of freight transport⁵:

- **Transport efficiency** - A 3,000 TEU container ship operating near Fremantle can carry ~30 times the freight volume of a train (100 TEU capacity)⁶, which can then carry up to ~50 times the load of a B-Double truck (2 TEU capacity).
- **Sustainability** – shipping uses lower energy with fewer carbon/greenhouse gas emissions and as a sea-based mode of transport delivers safety and reduced congestion outcomes compared to land-based modes (road/rail); For example, a bulk carrier of 10,000 -34,999 gross tonnage emits 7.9 grams of CO2 per t/km, making it over 10 times more efficient than a truck (80.0 grams per t/km)⁷. There are synergies with the Government's broader commitments to reduce carbon emissions.
- **Community expectations** – Given these environmental benefits, shipping meets community expectations regarding sustainability, and as a substitute for land-based transport, also improves safety and community amenity outcomes.
- **Supply chain resilience** – shipping can maintain supply lines when other modes (i.e., land/air) are disrupted, which is critical for a trade-dependent economy that is also geographically dispersed.
- **Adaptability** – ships (including generally domestic freight ships), can transport supplies to and from foreign markets).

¹ <https://web.archive.org/web/20201218113724/https://www.cmacgm-group.com/en/group/history/1996-2008-an-era-of-expansion> Ibid.

² https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IQv2.pdf

³ <https://wits.worldbank.org/CountryProfile/en/AUS> Ibid.

⁴ <https://www.portsaustralia.com.au/blog/coastal-trading-where-to-from-where#:~:text=15%20per%20cent%20of%20our%20domestic%20freight%20task%20is%20moved%20by%20shipping>

⁵ https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=itrdlg/coastalshipping/subs/sub37.pdf

⁶ <https://www.fremantleports.com.au/news/new-rail-wagons-mean-more-trucks-off-road>

⁷ Brenna, M., Bucci, V., Falvo, M. C., Foadelli, F., Ruvio, A., Sulligoi, G., & Vicenzutti, A. (2020). A review on energy efficiency in three transportation sectors: Railways, electrical vehicles and Marine. *Energies*, 13(9), 2378. <https://doi.org/10.3390/en13092378> pg.9

- **Cost benefits on a tonne kilometre basis** – shipping freight rates are typically the cheapest of all modes for certain commodities (see indicative data in Report B, (p24) on sugar, steel and container rates).

A strategic fleet could be designed to leverage these core benefits as a baseline and also align with other government policies to support growth of Australian industry and sovereign industry capability, for example:

- **The National Reconstruction Fund (NRF)**: which includes \$15B funding to diversify and transform Australia's industry in seven priority growth areas (renewables and low emissions technologies, medical science, transport, value-add in agriculture, forestry and fisheries, resources, defence and enabling capabilities).
- **The Ag2030 Strategy**: Setting the foundations for the agricultural sector to grow agriculture to \$100 billion by 2030, ensuring Australian agricultural producers receive maximum returns for their investments.

These policies are likely to increase demand for domestic and international freight transportation over the long-term. Shipping can help to secure lines of transportation for critical goods and commodities (i.e., minerals, food) also supporting access to supply chains for critical manufacturing industries, including those which are trade dependent.

The Current State

Existing Infrastructure & Ability to Meet Future Needs

Overview of the Current Operating Fleets (International and Australian Flagged Vessels)

For international-flagged vessels, the Australian Maritime Safety Authority (AMSA)'s Port State Control data indicates that in 2021, there was a total of 6170 foreign-registered vessels (up from 1.4% in 2020) making 26,400 port calls at Australian ports, with an average age of 11.3 years old.⁸

The current domestic shipping market, owing to the increased cost of operating Australian-flagged vessels relative to international-flagged vessels, has experienced a decline in the national fleet. Most Australian-flagged vessels service domestic coastal trading areas, which are restricted under Federal Cabotage Legislation. In 2018–19, 9.2 million tonnes of coastal shipping were carried by Australian-flagged vessels under general licence, comprising close to 17 per cent total coastal freight load, and 25 per cent of total coastal freight tonnage under license.^{9,10} Given this balance towards internationally flagged vessels for coastal trading, a strategic fleet could offset this dependency by helping to develop Australia's sovereign maritime capability. Noting the potential reliance issues around foreign ships acting in the national interest, Paper D provides specific analysis on scenarios and thresholds where specific sovereign capability will likely be required.

There are currently 11 Australian-flagged vessels (over 2,000 deadweight tonnes) that hold a General Licence under the *Coastal Trading (Revitalising Australian Shipping) Act 2012* and exclusively carry domestic cargo. There are also four LNG carriers that carry LNG internationally between Western Australia and Japan. The number of vessels in the merchant fleet has hovered around 11-16 ships over 2,000 dwt from 2019,¹¹ Prior to this, the Australian registered trading fleet consisted of 41 vessels (over 2,000 dwt) engaged in coastal trade

⁸ <https://www.amsa.gov.au/port-state-control-australia-2021-annual-report/year-review>

⁹ <https://www.bitre.gov.au/sites/default/files/documents/asf-2018-19.pdf> pg.8

¹⁰ <https://www.infrastructure.gov.au/infrastructure-transport-vehicles/maritime/publications/factsheets>

¹¹ https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/Shipping_-_Submission
15, Pg 7

and 10 (over 2,000 dwt).¹² By 2007, the Australian registered trading fleet (over 2,000 dwt) levelled out to 28 in coastal trade.¹³ These vessels predominantly operate between the mainland and Tasmania

Current Port Infrastructure

Australia conducts 99% of its export/import trade volume through ports, worth \$572.8 billion in 2018-19, or around \$1.5 billion of trade per day.¹⁴ Export/import volumes comprised over 92.6% of total cargo at Australian wharves, with 1582.3 million tonnes associated with overseas trade.¹⁵ The efficiency, effectiveness and dependability of our ports plays a determining role in our international competitiveness and ultimately affects the living standards of all Australians.

Pandemic-induced disruptions highlighted a range of long-term performance issues in the Australian maritime logistics system, particularly for the movement of containerised freight.

According to the Productivity Commission's 'Lifting productivity at Australia's container ports' report¹⁶, Australia's major container ports are considerably slower than many international container ports in the time to both unload and load ships. Two main points are factored into this analysis - those being the productivity and the number of cranes in use - with the latter noted by the productivity as a key explanation for the underperformance.¹⁷ Australia's major container ports of Botany (Sydney), Melbourne, Adelaide and Fremantle (Perth), ranked in the bottom 20% of global container ports measured in the World Bank's Container Port Performance Index (2021),¹⁸ except for Brisbane which ranked in the bottom 30%.

By focusing on time taken to turn ships around, the World Bank's metric provides a prima facie insight on productivity outputs (as longer turnaround times imply higher unnecessary costs). However, this lower-than-average port performance, did fully not account for the productivity of port infrastructure inputs; being the number of cranes deployed (crane intensity) and the productivity of those cranes (gross crane rates).

On average, Australian cranes were just as productive as the international average, whilst utilising fewer cranes to service ships than the average international ports¹⁹. This may be attributed to the low number of cranes deployed (crane intensity) rather than the overall productivity of those cranes (gross crane rates).²⁰

This indicates that the key drivers for quayside productivity were stevedores increasing investment in technology and automation (as discussed in the ACCC's Container Stevedoring Monitoring Report).²¹

The Productivity Commission still recommends that all major Australian container ports, apart from Adelaide, are not operating at a 'efficient frontier' and could still handle an increase in throughput by utilising capital inputs more efficiently.²²

Breaking down the total weight loaded at ports (in millions of tonnes) by state and territory in 2018-19, shows that WA had the largest load weight at 968.9 million tonnes loaded; followed by QLD (311.1 million tonnes); NSW (177.6 million tonnes); NT (29 million tonnes); VIC (22.1 million tonnes); SA (19.8 million tonnes); and TAS (11.5 million tonnes).²³

¹² <https://www.apec.org/docs/default-source/Publications/2011/1/The-Impacts-and-Benefits-of-Structural-Reforms-in-Transport-Energy-and-Telecommunications-Sectors/TOC/Maritime-transport-in-Australia.pdf> - pg. 296

¹³ Ibid.

¹⁴

<https://www.bitre.gov.au/sites/default/files/documents/asf-2018-19.pdf> pg. 7

¹⁵ Ibid.

¹⁶ <https://www.pc.gov.au/inquiries/current/maritime-logistics/draft/maritime-logistics-draft-overview.pdf>

¹⁷ Ibid - pg 10

¹⁸ <https://thedocs.worldbank.org/en/doc/66e3aa5c3be4647add01845ce353992-0190062022/original/Container-Port-Performance-Index-2021.pdf>

¹⁹ <https://www.pc.gov.au/inquiries/current/maritime-logistics/draft/maritime-logistics-draft-overview.pdf> pg. 12

²⁰ Ibid. p.g. 10

²¹ <https://www.accc.gov.au/system/files/Container%20stevedoring%20monitoring%20report%202020-21.pdf> pg. 58

²² Ibid. pg. 37

²³ <https://www.bitre.gov.au/sites/default/files/documents/asf-2018-19.pdf> pg. 49

Likewise, breaking down total containerised cargo throughput (TEU exchanged by '000) by the five largest Australian container terminals in 2020-21, shows that Melbourne had the largest total TEU exchanged with 3293.4; then Sydney (2704.2); Brisbane (1494.8); Fremantle (803.9); and finally, Adelaide with 396.40.²⁴

Current Land Based Freight Infrastructure

Australia's economic competitiveness through shipping is closely linked to the quality of our national land supply chain infrastructure – the railways and roads that link Australian goods and services to domestic and overseas markets through ports. Between 2020 and 2040, the total domestic land freight task is forecast to grow by 20%.²⁵ Road freight also plays a significant role in the transport of inputs to primary industries – agriculture, forestry and mining – and transporting the outputs of those industries to international export markets via shipping. Rail is more pivotal in providing intermodal links to coastal trading, providing Australia's large bulk commodities transport supply chains – i.e., iron ore, coal, bauxite/alumina/aluminium, and crude oil and condensate.

Road freight growth has declined since the early 1990s, from an average around 6 per cent per annum between 1971 and 1991, to around 3.8 per cent per annum between 1991 and 2012.²⁶ Domestic rail freight has grown more than ten-fold since 1971, from around 40 billion tonne kilometres in 1970–71 to around 450 billion tonne kilometres in 2019–20.²⁷

Coastal Trading and Target Commodities

Coastal shipping carries significant volumes of bulk commodities – notably bauxite, alumina, crude oil/condensate and refined petroleum – between Australian locations for further processing and/or refining.

Commodity by Commodity Breakdown²⁸

- **Bauxite/alumina** movements are by far the largest single-commodity coastal shipping task in Australia. BITRE projects domestic alumina production to remain around 21 million tonnes per annum between 2020–21 and 2026–27
- **Iron Ore:** Over the last decade, Australian coastal movements of iron ore have averaged between 3.6 and 4.0 million tonnes per annum. Most of the iron ore movements are from the Pilbara (Port Hedland) to Port Kembla, for input to BlueScope Steel's Port Kembla steelworks. Future coastal movements of iron ore are directly tied to continuing supply of feedstock to BlueScope Steel's Port Kembla steel plant given their status as sole domestic supplier.
- **Other Dry Bulk:** Coastal shipping movements of other dry bulk goods has increased, in trend terms, over the last 20 years from around 13.0 million tonnes in 1995–96 to around 23.0 million tonnes in 2019–20, albeit with significant year-to-year variability. Total dry bulk coastal freight volumes increased significantly in 2018–19 as a result of the transport of cereal grains from Western Australia and South Australia to drought-affected farmers —4.5 million tonnes and 813,000 tonnes respectively from both states.
- **Domestic Crude:** Australian domestic crude oil and condensate production has declined from around 30.3 billion litres in 1995–96 to to 18.4 billion litres in 2019–20. Much of the decline in domestic production has been experienced since 2008–09 and is attributable to declining output from the Northwest Shelf (Carnarvon Basin) and Bass Strait (Gippsland Basin) oil.
- **Refined Petroleum:** Australian refined petroleum products are used predominantly for transport, mining and energy generation. Coastal shipping of refined petroleum products consists of movements from

²⁴ https://www.bitre.gov.au/sites/default/files/documents/water_068.pdf pg.16

²⁵ <https://www.bitre.gov.au/forecasts>

²⁶ BITRE 2022 – Pg 7

²⁷ https://www.bitre.gov.au/sites/default/files/documents/research_report_152-final.pdf pg. v

²⁸ Australian aggregate freight forecasts – 2022 update 47-58

Australia's two remaining refineries or import terminals, to capital cities and regional ports, for subsequent distribution overland to nearby regional centres and/or significant industrial uses (e.g., mining).

- **Intercoastal Container Coastal Freight:** Inter-capital container freight has grown substantially over the past decade-and-a-half, from around 360 million tonne kilometres in 1995–96 to around 2200 million tonne kilometres in 2019–20 (on a freight loaded basis), an average annual increase of over 8.6 per cent per annum over that period.
- **Bass Strait Non-Bulk Freight:** Assuming the relationships between Bass Strait non-bulk freight and Tasmanian GSP continue to hold over the 2022 BITRE forecast horizon, the Tasmanian GSP forecasts imply trend levels of Bass Strait non-bulk freight increasing from around 1.45 billion tonne kilometres in 202;0 to around 1.62 billion tonnes kilometres in 2050 under the reference case – average annual growth of 0.5 per cent per annum over that period.

Imports

Australia imported 99.85 million tonnes via sea freight in 2021, worth \$250.94 million.²⁹ Australia's goods imports fell by over 5.7% during 2019-20, following the imposition of travel related and other COVID-19 restrictions.³⁰ Total value fell from \$421.4 billion in 2018-2019 to \$397.9 billion in 2019-2020.³¹

Six of Australia's top ten imports rely on shipment for transport.³² Categorising by shipment type, we find that refined petroleum products, and crude petroleum products rely on liquid bulk, non-containerised shipments. Moreover, Cars and machinery rely on break bulk non-containerised shipments. While telecom equipment and parts, computers, gold, and medicaments rely on containerised shipments.

From 1995-2015, imports, which were mostly comprised of non-bulk shipments, was growing at 4.1% p.a.³³ The largest share of Australian imports by sector were intermediate goods, comprising raw materials and components to be used by Australian firms for domestic and export goods markets. Imports over 2021-22, have growth by 43.9% to \$11 billion.³⁴

Exports

Australia exported 1.539 billion tonnes via sea freight in 2021, worth \$403.6 billion.³⁵ Eight of Australia's top ten exports rely on shipping for transport, and mainly comprised of iron ores, coal, aluminium ores, as well as copper ores and concentrates. All rely on dry bulk non-containerised shipments for transport. Natural gas and crude petroleum exports rely on liquid bulk noncontainerized shipments for transport.

From 1995-2015, Australian international sea freight grew at 6.4% p.a., more than twice the economic growth rate (3.1%). This was driven by an expansion in key export output, mainly bulk commodities which increased at 6.6% p.a.³⁶ Australia supplies an estimated 12% of total global trade and more than half of the global trade in iron ore.³⁷ As of September 2022, Australia had a positive trade balance of \$12,444 million (seasonally adjusted).³⁸

For two-way trade, Asian economies have a dominant market share with trade flows valued at 65.2% of the market. China remains Australia's largest two-way trading partner with a 28% share, valued at \$250 billion.³⁹ In 2020, Australia was the world's largest exporter of Iron Ore (\$79.6 billion), Coal Briquettes, Aluminium Oxide

²⁹ <https://datahub.freightaustralia.gov.au/insights/imports-exports/>

³⁰ <https://www.dfat.gov.au/sites/default/files/trade-and-investment-glance-2021.pdf> pg.39

³¹ <https://www.dfat.gov.au/publications/trade-and-investment/trade-and-investment-glance-2021> Ibid.

³² <https://oec.world/en/profile/country/aus> Ibid.

³³ https://australasiantransportresearchforum.org.au/wp-content/uploads/2022/03/ATRF2016_Full_papers_resubmission_60.pdf pg. 3

³⁴ <https://oec.world/en/profile/country/aus?subnationalFlowSelector=flow0>

³⁵ <https://datahub.freightaustralia.gov.au/insights/imports-exports/>

³⁶ https://australasiantransportresearchforum.org.au/wp-content/uploads/2022/03/ATRF2016_Full_papers_resubmission_60.pdf pg.3

³⁷ <https://www.abs.gov.au/statistics/economy/international-trade/international-trade-goods-and-services-australia/latest-release> Ibid.

³⁸ <https://www.dfat.gov.au/trade/trade-and-investment-data-information-and-publications/trade-statistics/australias-trade-balance>

³⁹ <https://www.dfat.gov.au/sites/default/files/trade-and-investment-glance-2021.pdf> pg.13

(\$3.59 billion), Sheep and Goat Meat (\$2.7 billion), and Wool (\$1.58 billion). Exports over 2021-22, have growth by 19.8% to \$7.62 billion.⁴⁰

Regulatory Requirements

Maritime Regulation

International regulation

Australia has ratified the United Nations Convention on the Law of the Sea 1982 (UNCLOS) which sets out Australia's rights and responsibilities in relation to its adjacent waters. UNCLOS regulates all aspects of the resources of the sea and uses of the ocean, including navigational rights and the conservation and management of marine life. Australia has likewise ratified the International Convention for the Prevention of Pollution from Ships 1978 (MARPOL), and this is domestically given effect via the Protection of the Sea (prevention of Pollution from Ships) Act 1983 and the Navigation Act 2012.⁴¹

The Maritime Labour Convention 2006 (MLC) and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention), consolidates existing labour conventions and establishes protections for the working and living conditions of seafarers. Australia has implemented these standards through the Navigation Act 2012.⁴²

Domestic legislation

Australia's primary framework for maritime regulation is established under the *Navigation Act 2012* (Cth) (**Navigation Act**) as the core legislative means regulating international ship, seafarer safety and maritime protection, and the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* (Cth) (**National Law Act**) (and the Marine Orders to which the Acts give effect) which act as a consolidated framework for the safe operation and certification of domestic commercial vessels inside Australia's exclusive economic zone

The movement of cargo or passengers on ships between ports in Australian states and territories, or coastal shipping, is regulated by the *Coastal Trading (Revitalising Australian Shipping) Act 2012* (Cth) (**CT Act**). The CT Act broadly captures the following objectives:

- Promote a viable shipping industry that contributes to the broader Australian economy;
- Facilitate the long-term growth of the Australian shipping industry;
- Enhance the efficiency and reliability of Australian shipping as part of the national transport system;
- Maximize the use of vessels registered in the Australian General Shipping Register in coastal trading; and
- Promote competition in coastal trading.

The CT Act intends to enhance sovereign coastal trading by granting Australian flagged vessels⁴³ with a general licence that allows for unrestricted coastal trading between Australian states and territories for 5 years, while foreign-flagged vessels can apply for a Temporary Licence (valid for 12 months), which enables them to conduct voyages authorised by the licence that carry domestic cargo.

The *Carriage of Goods by Sea Act 1991* (Cth); *Customs Act 1901* (Cth); *Limitation of Liability for Maritime Claims Act 1989* (Cth); *Occupational Health and Safety Regulations*:⁴⁴ and the *Shipping Registration Act 1981*

⁴⁰ <https://oec.world/en/profile/country/aus?subnationalFlowSelector=flow0>

⁴¹ <https://www.amsa.gov.au/marine-environment/marine-pollution/marpol-and-its-implementation-australia>

⁴² <https://www.amsa.gov.au/vessels-operators/seafarer-safety/about-maritime-labour-convention-2006>

⁴³ Vessels registered on the Australian General Shipping Register.

<https://www.legislation.gov.au/Details/C2021C00432>

⁴⁴ *Occupational Health and Safety (Maritime Industry) Regulations 1995* (Cth); *Occupational Health and Safety (Maritime Industry) (National Standards) Regulations 2003* (Cth).

(Cth) are also significant pieces of maritime legislation. This legislation variously regulates cargo shipment processes, cargo inspections, maritime damages and liability, alongside occupational health and safety and ship registration.

Competition

Part X of the *Competition and Consumer Act 2010* (Cth) regulates international liner shipping of cargo travelling to and/or from Australia. Its key objective is to ensure adequate frequency and reliability of export shipping services, and internationally competitive freight rates. There have been calls from industry and the ACCC to repeal or reform Part X as it does not provide Australian fleets with the intended level of protection.

Industrial Relations

In general, the *Fair Work Act 2009* (Cth) (**FW Act**) applies to all Australian ships and ensures that vessels operate in line with a minimum set of employment terms and conditions.⁴⁵ The FW Act also applies to foreign-flagged ships engaged in coastal trading under licence, provided the vessel has made at least 2 other voyages under licence. Foreign vessels operating under a coastal trading licence must pay crew additional wages (called Schedule A wages) from the third voyage onwards in any 12-month period.

Workers on ships are also protected under certain agreements and minimum wage determinations under the Navigation Act and the *Shipping Registration Act 1981* (Cth).

Requisition or acquisition powers

The Coastal Trading Act, National Law Act and Navigation Act do not currently contain any rights for the Commonwealth to requisition or acquire a vessel for use by the Commonwealth.

There are, however, other Commonwealth Acts that may permit the Commonwealth to requisition or acquire a variety of vehicles, which include vessels. For example, the Defence Act contains a power of 'impressment' that allows authorised officers to furnish a vessel (i.e., take possession and use a vessel) where the vessel is required for naval, military or air-force purposes. In the maritime context, such powers have traditionally been used in times of war or conflict – for example, the Commonwealth used the Defence 'impressment' power to use several commercial vessels owned by Huon Transport between 1939 and 1942.⁴⁶

It is worth noting that any requisition or acquisition of a vessel by the Commonwealth is required to be on 'just terms' to comply with protections set out in Australia's Constitution (noting 'just terms' has not been thoroughly explored by the high court).

Strategic Support

Supporting Smaller & Remote Communities

Remote and regional areas contend daily with a complex logistical environment consisting of barriers such as "vast distances, a small population, climatic extremes, and demanding geography – challenges that require a more tailored approach to transport regulation, infrastructure and service delivery".⁴⁷

In September 2022, Australia's largest shipping company, SeaSwift, raised shipping prices by 14.5%, citing increases in labour and maintenance, a move expected to place Torres Strait Islander and Cape York residents

⁴⁵ A ship registered on the Australian General Shipping Register, a ship operated by an Australian and uses Australia as a base, a majority Australian-crewed ship, or a ship that supplies, services, or operates in connection with, a fixed platform and operates to and from an Australian port.

⁴⁶ See for example the High Court decision of *Commonwealth v Huon Transport Pty Ltd* [1945] HCA 5, at <http://classic.austlii.edu.au/au/cases/cth/HCA/1945/5.html>

⁴⁷ https://dipl.nt.gov.au/_data/assets/pdf_file/0005/1032278/national-remote-regional-transport-strategy.pdf - pg. 1

under financial stress.⁴⁸ For many communities, SeaSwift is the sole provider. Where there is a sole provider, there may be merit in the ACCC providing price monitoring as is conducted in the Stevedoring industry.⁴⁹

A previous APH report identified remote WA communities as being a prime target for increased coastal shipping support, particularly with respect to the ability to rendezvous with barge operators to transfer cargo⁵⁰. As with the Torres Strait and Cape York, there is only one dedicated coastal shipping line, that being Seacorp⁵¹.

For King Island and the Furneaux Group of Islands, much of their livestock industries rely heavily on regular low-cost shipping services to mainland Tasmania, which can bring unique challenges to small businesses. Over 99% of goods leaving and arriving in Tasmania are moved by sea across Bass Strait, with high fixed and low marginal costs⁵².

A commercial strategic fleet would provide a pivotal linkage to smaller communities and a critical contingency during the wet season when roads are inaccessible. The fleet could also introduce new competition to these less serviced markets and help offset cost rises, and potentially restrict opportunistic companies seeking to exploit vulnerable communities impacted by natural disruption to the transport corridors.

Existing Industry Interaction with Defence and Opportunities for Cooperation

A key role of Defence is protecting maritime shipping and trade noting free movement of commercial shipping is both a whole of nation necessity, but also essential for the ADF to effectively sustain its own operations⁵³ Unlike most if not all other maritime nations, Australia is not now and unlikely in the short term to be self-sufficient in maritime trade. This has implications for the disruption of trade in times of tension and in war.⁵⁴ Australia cannot requisition a merchant fleet. This has implications for potential ADF operations in war but even in peacetime, where large-scale regional disaster relief efforts would be unable to call upon significant numbers of civil shipping, meaning that such operations would be entirely reliant on the Navy, with flow-on effects for concurrency tasking.

The Australian Maritime Defence Council (AMDC) was established in 1982 as one of the fora in which senior Defence and industry stakeholders could exchange information on trends and matters of national maritime interest. The chair of the AMDC is the Deputy Chief of Navy and council members include shipping companies, the Australian Ship Repair Group, Maritime Border Command and the Maritime Union of Australia.⁵⁵

In addition, the Royal Australian Navy (RAN) has Maritime Trade Operations (MTO) officers who provide the Navy with an industry link. This is a professional team of Reserve personnel whose normal employment includes experience in the civil and commercial maritime sectors and who are familiar with port and merchant ship operations.⁵⁶ Development of this niche capability may assist in ensuring greater coordination between the ADF and industry.

The RAN plan **Mercator: Maritime Domain Strategy 2040** highlights the need to increase our sovereign industrial capability and capacity whilst leveraging emerging technologies.⁵⁷ Shared capability growth has been a longstanding objective of the Australian Defence Force (ADF), as evidenced by the 2005 publication **Future Maritime Operating Concept 2025 (FMOC)** established to coordinate strategic development in the maritime warfighting environment between the Navy, Army, and Airforce. As such, any strategic fleet should be positioned within the framework and earmarked for potential deployment use cases, particularly as an “enabling element” in

⁴⁸ <https://arr.news/2022/08/16/sea-swift-to-put-up-prices-by-14-5-from-september/>

⁴⁹ <https://www.accc.gov.au/regulated-infrastructure/shipping-and-waterfront/container-stevedoring-monitoring>

⁵⁰ https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=itrldg/coastalshipping/subs/sub37.pdf - pg. 4 - 5

⁵¹ Ibid.

⁵² https://dipl.nt.gov.au/_data/assets/pdf_file/0005/1032278/national-remote-regional-transport-strategy.pdf pg. 24

⁵³ [Australian Maritime Operations 2017.pdf \(navy.gov.au\)](https://www.navy.gov.au/sites/default/files/documents/Australian_Maritime_Operations_2017.pdf)

⁵⁴ <https://navalinstitute.com.au/wp-content/uploads/Protecting-Australian-Maritime-Trade-Report-2022-Final-version.pdf>

⁵⁵ [Semaphore: Australian Maritime Defence Council | Royal Australian Navy](https://www.navy.gov.au/sites/default/files/documents/MERCATOR_2040.pdf)

⁵⁶ [Australian Maritime Operations 2017.pdf \(navy.gov.au\)](https://www.navy.gov.au/sites/default/files/documents/Australian_Maritime_Operations_2017.pdf)

⁵⁷ https://www.navy.gov.au/sites/default/files/documents/MERCATOR_2040.pdf

the Knowledge, Command and Control component of the framework which aims to deliver “enhanced situational awareness” of the maritime environment.⁵⁸

On the civilian support front, as climate change increases the incidence of cyclones, earthquakes, and tsunamis in the Pacific and Indian Oceans, Australia will need to ramp up capacity to aid affected local populations and regional allies. The RAN must, therefore, be prepared to upscale Humanitarian Assistance and Disaster Relief, and its ability to sealift aid will become one of its most important non warfighting functions.⁵⁹ A strategic fleet should factor into planned readiness reviews by the RAN to meet climate change deployment and diversion scenarios.

A strategic national fleet could also support the development of naval remotely operated maritime technologies/other defence technology trials.⁶⁰ A key example of this is the Patrol Boat Autonomy Trial (PBAT) between Austal, Trusted Autonomous Systems Defence Cooperative Research Centre and the Royal Australian Navy Warfare Innovation Navy (WIN) Branch.⁶¹ The Trial will establish robotic, automated and autonomous elements on a patrol boat, providing a proof-of-concept demonstrator, for optionally crewed or autonomous operations for the RAN into the future. The Trial will also explore the legal, regulatory pathways and requirements of operating an autonomous vessel at sea.⁶² There may also be opportunities for Australian industry to contribute to developing and maintaining these technologies.

This privatisation trend has also been reflected in Ports. However, a reliance on long-term lease arrangements of key Australian ports has led to distortions in market pricing and is understood to have resulted in high rent costs and profits that are not always translated back into the Australian economy.⁶³ In addition, the ability to maintain large-hulled vessels in Australia is limited with the Defence owned Captain Cook Graving Dock the only option for out of water maintenance. CCGD is used by commercial vessels when not needed for RAN vessels, but this capacity may need to be increased for the strategic fleet. The Commonwealth announced a project to develop an additional large vessel dry berth at Henderson in Western Australia to support construction and sustainment of large naval vessels, however, it will provide an additional option should the strategic fleet include large-hulled vessels.⁶⁴

A strategic fleet must be appropriately structured and targeted in key areas so as to contribute to the spectrum of ADF operational requirements, from large-scale combat operations through to Humanitarian Assistance and Disaster Response (HADR) Operations. It could provide assured surge capacity for mobilisation and opportune additional capacity to support regional influence activities, and both import and export functions of a growing defence industry. Defence is also reliant on the import of critical commodities, particularly fuel, ammunition and spare parts.’

High-Level Anticipated Benefits of a Strategic Fleet

While Work Papers B-D will provide more detailed and specific recommendations regarding the comparative advantage of a strategic fleet, this paper will lay out a broader suite for consideration. A strategic maritime fleet could strengthen sovereignty through providing a base level Australian sovereignty capability and so reduce the risks inherent in relying solely on foreign registered ships. It promotes stability in domestic shipping to provide certainty for long term investment and could lead to the eventual development of a maritime cluster, aimed at maximising commercial benefits to the nation from Australia’s heavy demand for shipping services.

Ultimately, the strategic fleet can help to address current and future problems within Australia’s freight and logistics sector, including but not limited to spikes in port congestion, disruptions to the availability of foreign ships and reliability of land-based freight in the event of a natural disaster. These and other potential benefits and opportunities for the strategic fleet are outlined below:

⁵⁸ https://www.navy.gov.au/sites/default/files/documents/FMOC_2025_Unclassified.pdf

⁵⁹ <https://www.navy.gov.au/media-room/publications/soundings-papers-when-disaster-strikes-assessing-assessing-ran-preparedness-hadr>

⁶⁰ <https://www.navalnews.com/naval-news/2022/10/austal-to-conduct-patrol-boat-autonomy-trial-for-royal-australian-navy/>

⁶¹ <https://www.navalnews.com/naval-news/2022/10/austal-to-conduct-patrol-boat-autonomy-trial-for-royal-australian-navy/>

⁶² <https://www.australiandefence.com.au/defence/sea/austal-to-undertake-patrol-boat-autonomy-trial-for-ran> Ibid.

⁶³ <https://www.businessthink.unsw.edu.au/articles/australia-container-ports-privatisation-productivity>

⁶⁴ [Multi-billion dollar large ship infrastructure for Henderson, Western Australia | Defence Ministers](#)

- **Mitigate Natural Disasters:** providing surge freight capacity in the event of road and rail freight and/or air freight disruptions due severe weather events or natural disasters that affect Australia or our regional neighbors.
- **Improving Remote Area Supply Availability:** providing support to regional and remote coastal regions and territories with limited, vulnerable or non-existent overland freight supply chain lines.
- **Deliver Critical Commodities:** enhancing the flow of critical supply chain inputs across health, energy, resources and agricultural sectors. In certain circumstances, foreign-owned fleets may not operate in a manner that aligns with Australia's national interest and may be subject to different requirements, jeopardising the supply of critical goods.
- **Provide Defence Capability:** providing defence surge capacity for the strategic movement of equipment, personnel, vehicles, and stores to bridge supply gaps in border security, regional and surveillance operations. It can also contribute to sovereign defence capability by enabling regional influence building activities (I.e., defence exports to like-minded neighbours)
- **Enhance Interstate Commerce:** providing enhanced opportunities for coastal trading between the states, the Northern Territory, and the external territories, present new freight options for commercial operators and open opportunities for regional ports.
- **Support and Maintain a Skilled Maritime Workforce:** providing a pipeline to build Australia's workforce skills development, particularly for critical maritime roles such as marine pilots, harbour Masters, and tug Masters.
- **Manufacturing Support:** A strategic fleet could provide essential manufacturing inputs to support the seven priority areas identified in the National Reconstruction Fund, those being renewables and low emission technologies; medical science; transport; agriculture, forestry and fisheries; resources; defence capability; and enabling capabilities & technologies. Examples include transport construction, critical minerals for hi-tech devices and medical equipment componentry

The strategic fleet must be adaptable to withstand ongoing disruptions.

A strategic fleet may support efficient and effective movement of freight, and offset impacts that reflect volatility in the forward environment. Examples of potential impacts include:

- **Future Pandemics – Workforce Issues:** Employment in the Water Transport industry has suffered significantly following the COVID-19 lockdown, given the transient nature of employment and reliance on foreign crew. Maritime employment in Australia has slowly started to rise towards pre-pandemic levels and employment is expected to further increase by 2025.⁶⁵ A strategic fleet may be able offer training and education pipelines to further support and maintain a skilled maritime workforce and reduce our reliance on international crews.
- **Household Good Demand & E-Commerce:** Economic volatility impacts on demand and supply for goods (including household goods and consumables) including over the recent period with variable interest rates impacting on consumer spending. Although the measures are seeking to stem household and good demand, this has had minimal effect of supply chain disruptions. A strategic fleet may be able to meet localised spikes in shipping demand or respond to disruptions in supply chain processes which limit the quantity of freight delivered.
- **Port & Container Congestion:** Port disruptions relating to availability of workers, overflowing empty container parks, and increased volume of trade following the COVID-19 pandemic created large backlogs in supply chain distribution. However, these abnormally high levels have eased, continuing a trend towards weaker volumes which can be attributed to the disruption of global and local supply

⁶⁵

<https://nationalindustryinsights.aisc.net.au/industries/transport/maritime#:~:text=Employment%20is%20projected%20to%20increase%20to%2015%2C300>

chains. It should be noted that although the impact of reduced consumption due to high prices is minimal, inflationary pressures and the risk of recession may decrease port volume levels.

- **Disruption to the availability of foreign registered ships of the type required at the time required:** There could conceivably be disruptions to international transit capacity due to geopolitical disruptions. In such a disruption, there may be value in a Strategic Fleet undertaking coastal calls that would otherwise be undertaken by international vessels (under licence).
- **Disruptions to sourcing of key products,** requiring responsive adaptation of supply routes for accessing critical products: In such scenarios, a strategic fleet could restore supply routes and build resilience where there is heavy import reliance. A key example of this is fuel where there are limited domestic reserves and a need for continuous operation of at least 45 oiler tankers to provide crude for Australian refineries.⁶⁶

Structures surrounding a strategic maritime fleet must be appropriate to withstand volatility.

The strategic fleet must be integrated into Australia's broader transport system, to facilitate viable diversification and flexible model transfer of freight in times of need, such as disruptions to freight corridors, pressure on the global supply chain, and plan for creating a future-ready workforce.

- **Disruptions to Land Based Rail & Road:** In early 2022, flooding in South Australia closed land freight connections between Western Australia (WA) and the east coast for 24 days, causing serious disruption to the supply chain and resulting in severe consumer shortages and empty supermarket shelves. The Western Australian Government has now established a taskforce to investigate how WA's freight and supply chains could be strengthened, suggesting support for an interstate shipping route. As recent as the 25th of November, the East-West Rail Corridor has again been disrupted due to flooding⁶⁷.
- **Global Supply Chain Pressure: Supply chain pressures,** measured by the Global Supply Chain Pressure Index (GSCPI), have moderately increased in October, following a consecutive 5 month easing. Year-to-date movements suggest that global supply chain pressures are starting to converge on historical levels.⁶⁸ A strategic national fleet may be able to help mitigate short spikes in demand for goods, or conversely disruptions to supply chain processes, in highly localised areas.
- **Aging Workforce:** The current average age of maritime personnel is 49 years, with nearly 2/3 (62.7%) being 45 years old or older.⁶⁹ Investment into VET and TAFE for maritime accreditation may need to occur concurrently with the investment in a strategic maritime fleet to avoid structural disruptions and supply chain deficiencies.

A strategic fleet will need to be both modern and provide the capability to foster more innovative advancements in the Australian Maritime logistics industry.

Technological transition of the maritime sector towards digitisation, e-navigation, and green energy fuels provides opportunities for Australia to contribute to the development and advancement of these technologies, further supporting our sovereign industry capability in this area.

- **Shipping Digitisation:** Incorporating new technologies into the maritime industry will be critical to support a viable commercial fleet. There is also work to be done in the legal, regulatory areas as well training Australian crews to safely utilise these technologies. Marine Autonomous Surface Ships (MASS), and other emerging technologies can act as a critical enabler for productivity improvements.

⁶⁶ <https://www.energy.gov.au/sites/default/files/liquid-fuel-security-review-interim-report.pdf> pg.30

⁶⁷ <https://www.railjournal.com/infrastructure/australias-east-west-corridor-disrupted-again/>

⁶⁸ <https://www.newyorkfed.org/research/policy/gscpi#/interactive>

⁶⁹ <https://info.ajg.com.au/hubfs/Documents/The%205%20most%20challenging%20emerging%20risks%20facing%20the%20maritime%20industry.pdf>

Autonomous ships are crewless and can navigate on a semi-independent level from human interference via the use of AI software and hardware.

- **Information, Communication and Technology Advancements:** Industry continues to push the boundaries of technology. Vessels that operate within Australian waters are becoming more technologically sophisticated, with increasing automation in navigation, communications, and control systems⁷⁰. Initiated by the International Maritime Organisation (IMO), “e-navigation” seeks to provide bespoke shipping information in electronic formats, offering a more efficient and safer connection between ship and shore.
- **Sustainability and Fuel Transition:** Transition of the strategic fleet provides opportunities to support Australia's emissions reduction targets and further to lead in the development, application service of low carbon industrial applications. Leveraging our highly skilled service sector, on the back of our strategic maritime fleet, there is an opportunity for Australia to lead the Asia-Pacific as a service hub for advance and low carbon maritime technologies.

⁷⁰ <https://www.amsa.gov.au/sites/default/files/looking-ahead-2017-2027.pdf> pg.2

Strategic Maritime Fleet Report: Work Paper B

DITRDCA

December 2022

Released under the freedom of Information Act 1982 by the Department of
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Document Control

Version	Description	Submission Date
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1.1	Added case studies from Lloyd's list data	05/12/2022
1.2	Addressed feedback from the panel (1 source) and the Department (3 sources)	07/12/2022

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B. Analysis of Australia's Shipping Vessels and Cargo Movement

1. Overview

As a small island nation, maritime trade is an essential part of life in Australian, and critical to the national economy. Almost all of Australia's imports and exports by volume come by sea, more than 99 per cent. By value shipping represents around 80 per cent of trade.¹

In 2018-19, the last full financial year before the pandemic 6,009 uniquely identified cargo ships made 34,179 calls at Australian ports. In 2020-21, during the pandemic, this dropped to 6,315 uniquely identified cargo ships making 30,613 port calls at Australian ports.²

The COVID-19 pandemic highlighted the need for Australia to consider, perhaps in a new light, the strategic needs and capability of Australian shipping suppliers (across all modes) to meet demand for exports and essential imported goods in the future. While major shipping lines remained open during the COVID-19 crisis, maritime supply chains experienced significant disruption, raising valid questions about Australia's reliance on foreign flagged vessels. How exactly the pandemic influenced the maritime transport industry, and the contra-scenario where a larger impact was experienced due to increased severity/incidence of sickness, is an extensively researched topic.³

During the pandemic, port congestion, supply chain issues and delays in supply were met by historically large increases in shipping costs (which are yet to fully unwind). But perhaps more importantly the pandemic motivated the Australian Government to ask, 'how exposed are Australians', and does our reliance on foreign flagged vessels represent a sovereign and or a security risk?

The pandemic certainly exposed the fragility of Australia's reliance on shipping, the Terms of Reference for the Strategic Fleet Taskforce note:

'These disruptions have highlighted the interconnectedness and complexity of global shipping supply chains and risks to Australia's economic sovereignty and national security.'⁴

Australia's shipping industry plays a critical enabling role in the national economy, from the movement of major bulk commodities for export to the delivery of containers and cargoes with goods for final processing, and more importantly capital goods which are inputs to industry, and lastly consumer goods meeting the needs of Australian consumers, including essential goods.. However, as outlined in paper A (p.4) there are currently 11 Australian-flagged vessels (over 2,000 deadweight tonnes) that hold a General Licence under the *Coastal Trading (Revitalising Australian Shipping) Act 2012* and exclusively carry domestic cargo.

The world is rapidly changing, geopolitical tensions have risen to unprecedented levels. As evidenced by the Russian invasion of Ukraine, the resultant crisis in global energy markets and disruption to essential grain and food supplies to many countries. The fall out has damaged the global economy and pushed up global inflation and economic risks.

¹ Australian Shipping – March 2019, Submission to the standing Committee on Rural and Regional Affairs and Transport References Committee.

² Prepared by BITRE from Lloyd's List Intelligence (LLI), 2022. Australian ship movements (unpublished data), London.

³ COVID-19 impact on global maritime mobility – September 2021, Millefiori et al. *Nature*

⁴ Ibid

In the context of Australia's extreme reliance on the shipping industry, the events from late 2019 to the present day indicate deeper analysis is required to assess of the level of risk Australia is implicitly taking on board with respect to the reliance on third party international shipping companies for supply of essential and critical goods imports and goods exports.

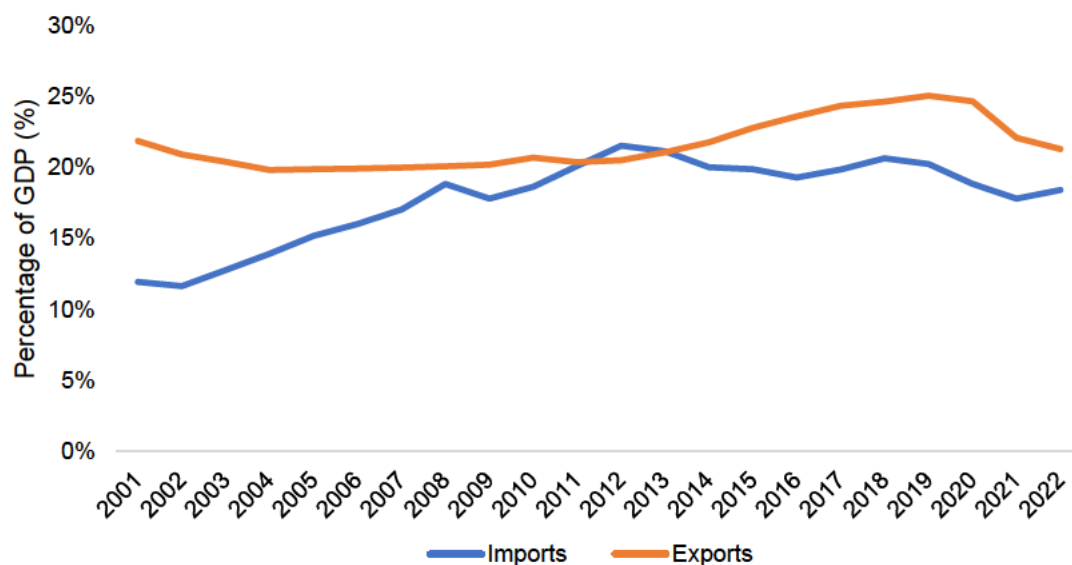
Australia's reliance on a highly skilled maritime workforce to ensure certainty of supply and the efficient running of the economy indicates that a strategic analysis of shipping trade flows is needed. The following analysis looks at linking trade data together with shipping data to shed some light on the role a strategic maritime fleet could play to minimise future economic risks.

2. Current and Future Cargo Volumes

International trade is critical to both the Australian economy and the social welfare of the Australian public, creating jobs, income and supporting long-term prosperity. International trade is an important pre-cursor supporting innovation, with international competitiveness critical to opening opportunities for Australian businesses to grow and expand. Shipping is critical to all industries that rely on goods imports or goods exports.

One way of visualising the importance of trade to the Australian economy over time is by looking at the proportion of Gross Domestic Product (GDP) represented by trade. In 2021-22, import volumes were 18 per cent of Australia's GDP while export volumes were 21 per cent of Australia's GDP (see figure 1). Together import and exports are a measure of Australia's openness to trade, and trade openness is comparable internationally. Australia's openness to trade is relatively high compared to our international peers, and this is a measure of the strategic importance of trade to the Australian economy.

Figure 1: Import and export as a share of GDP in Australia: 2000-01 to 2021-22



Source: ABS national accounts

Goods account for a significant majority of Australia's international trade, standing at 87 per cent in 2021-22. Seaborne trade accounts for almost all of Australia's export and import in goods by weight, at 99.9 per cent in 2018-19.⁵ Understanding the current state and the future state of the demand for cargo movement from, to and within Australia will help to inform the government's view of how strategically important the shipping industry is to the Australian economy and what risks may be realised if trade flows are disrupted.

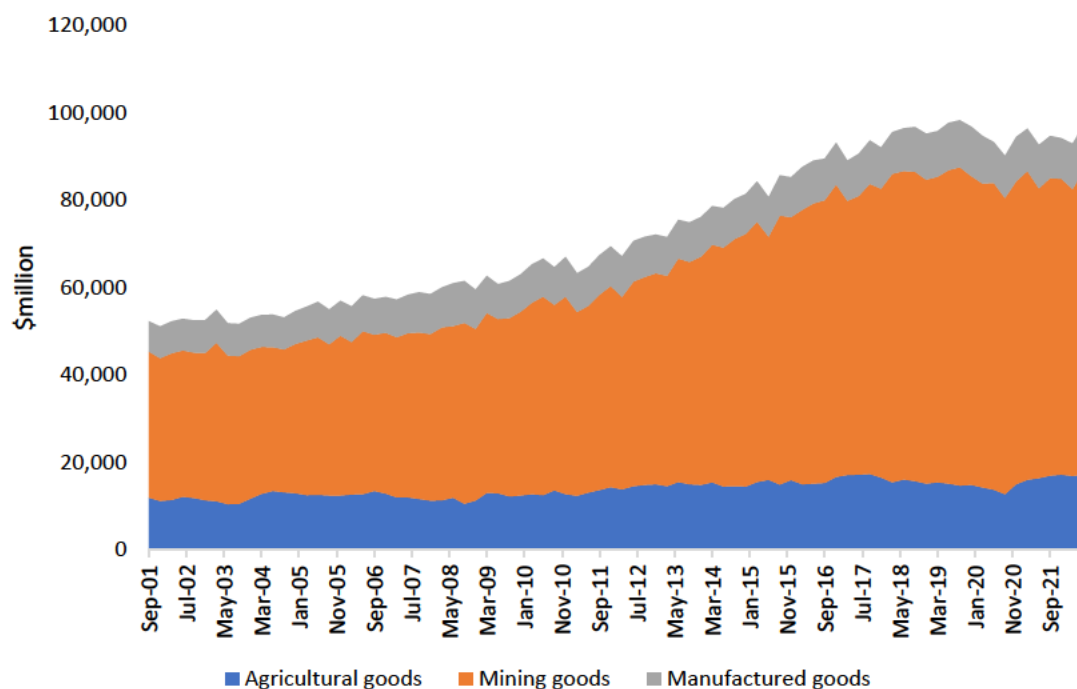
⁵ This is calculated based on the Australian sea freight 2018-19 report and the Freight performance dashboard from The National Freight and Supply Chain Strategy.

2.1. Current state

2.1.1 Exports

In the 2020-2021, Australia exported approximately 1,516 megatonnes by sea, worth approximately \$374 billion.⁶ Australia's goods export values are dominated by mining products (see figure 2). In 2021-22, mining exports accounted for approximately 73 per cent of goods exports by value or \$274 billion. This is followed by agriculture goods (16 per cent or \$59 billion), with manufactured goods the smallest by value (11 per cent or \$39 billion).

Figure 2: Australia's merchandise export 2001-02 to 2021-22, constant prices (quarterly)



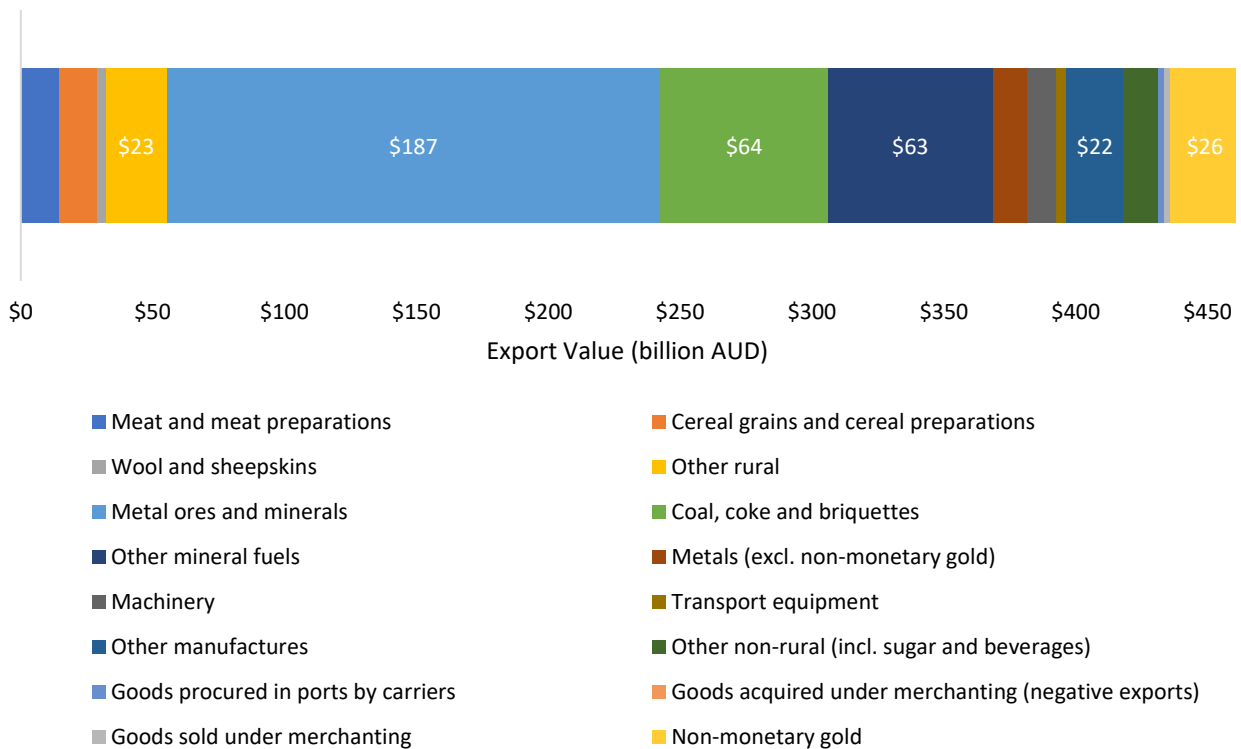
Source: ABS International Trade in Goods and Services

Figure 3 outlines the further breakdown of exports by value. Within mining, metal ores and minerals (\$187bn) account for the majority of Australia's merchandise exports, at around 60 per cent of all mining exports, followed by coke coal and briquettes (\$64bn) and other mineral fuels (\$63bn). Within agriculture, exports are mostly dominated by meat and meat preparations (\$15bn), and cereal grains and cereal preparations (\$14bn), together accounting for 52 per cent of all agriculture goods exported.) are also present. Within manufactured goods exports, other manufactures⁷ including food, beverage, chemical and textile manufacturing are the largest category (\$21 bn), followed by machinery (\$11bn).

⁶ National Freight Data Hub, <https://datahub.freightaustralia.gov.au/insights/imports-exports/>

⁷ 'Other Manufactures' here means non-rural manufactured goods, excluding machinery, transport equipment or consumption goods.

Figure 3: Breakdown in Australia's merchandise export, current prices (2021)

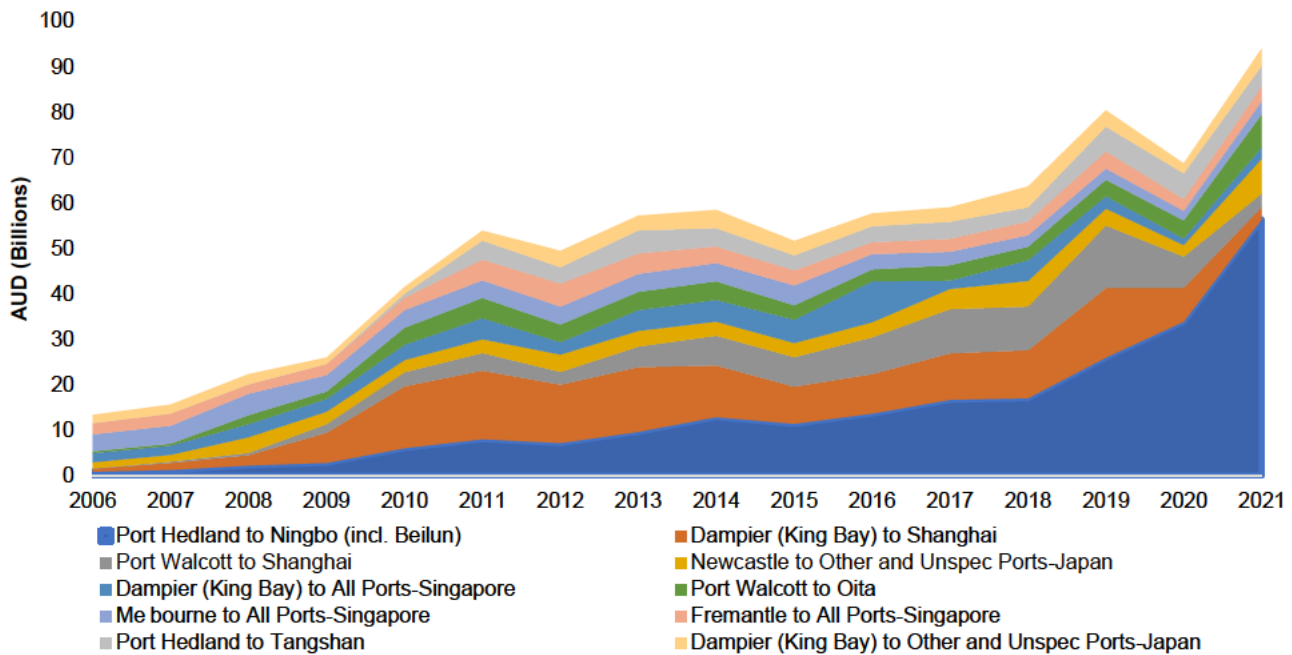


Source: ABS International Trade in Goods and Services

Top ten export trade routes (2006-2021)

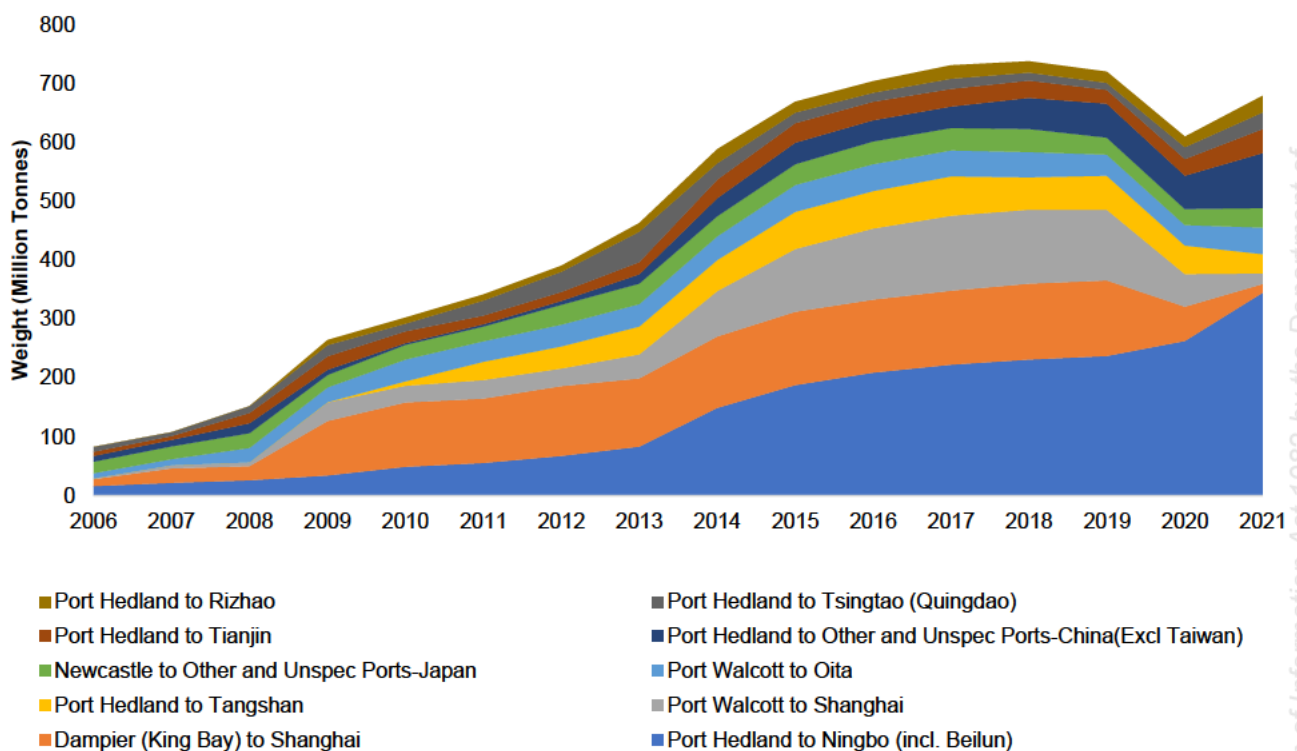
The top ten export trade routes by value consist of trade routes from WA to China or Japan that mostly transport mining and other natural resource products (6) or trade routes to Singapore that mostly transport manufactured goods and agriculture products (4). The common ship types required are bulk carriers/tankers (for the former) and general cargo ships/container carriers (for the latter).

Figure 4: Top ten export trade route by value, 2006-2021



Source: ABS customised trade datasets; PwC calculations

Figure 5: Top ten export trade route by weight, 2006-2021, 2006-2021



Source: ABS customised trade datasets; PwC calculations

Note: While Figure 4 above aggregates trade flows since 2006, information on the volume and value of the top historical flows given below is for 2021.

Bulk carrier

Port Hedland to Ningbo (inc. Beilun) (volume - 345 MT; value - \$56 billion)

Port Hedland is the world's largest bulk export port, with exports including iron ore, gypsum and salt. It is one of three major iron ore export ports in the Pilbara region of Western Australia.

Ningbo is a major sub-provincial city in northeast Zhejiang province of the People's Republic of China. The port is the busiest in the world in terms of cargo tonnage (1120 MT in 2019), trading with over 560 ports from more than 90 countries and regions worldwide.

The primary product of this trade route is iron ore, carried by bulk carriers, but also includes gypsum and anhydrite.

Dampier (King Bay) to Shanghai (volume - 47 MT; value - \$23 billion)

Dampier is a major industrial port in the Pilbara region of Western Australia. Primarily, it is a port for the export of iron ore from Rio Tinto mines, liquified natural gas and salt.

Shanghai is the world's busiest container port, located on the southern estuary of the Yangtze River. It serves the provinces of Anhui, Jiangsu, Zhejiang and Henan provinces with its dense population, strong industrial base and developed agricultural sector.

This trade route primarily serves the purpose of moving iron ore and concentrates by bulk carrier.

Port Walcott to Shanghai (volume - 18 MT; value - \$3 billion)

Port Walcott is a large open-water harbour located near the town of Port Samson in Western Australia. It lies between Dampier and Port Hedland at the mouth of the Harding River.

Much like trade between other ports in the Pilbara region, this route to Shanghai is focused on the export of Australian iron ore and concentrate by bulk carrier.

Newcastle to Other Japanese Ports (volume - 34 MT; value - \$8 billion)

The Port of Newcastle is a major seaport in the city of Newcastle, New South Wales. It is the world's largest coal port by weight, though has the capability to manage a number of other cargoes.⁸

The exports Japan receives from Australia largely focus on coal and iron ore products.

Port Walcott to Oita (volume - 45 MT; value - \$7 billion)

Oita is a major Japanese port city located in the Oita Prefecture on the island of Kyushu. It principally imports iron ore, crude oil, LNG, coal and construction materials. It accepts varied vessels, although mostly trades with general cargo ships. Similar to other Pilbara-region ports, Port Walcott primarily ships iron ore and concentrates to Oita via bulk carriers.

Port Hedland to Tangshan (volume - 33 MT; value - \$5 billion)

The Port of Tangshan is an artificial deep-water international seaport on the coast of the Tangshan Municipality in the Hebei province of China. As the second largest coastal port in the world by weight, it is key for the distribution of materials throughout the country.⁹

Like other exports from Pilbara region, trade from Port Hedland to Tangshan is largely composed of iron ore and concentrates, delivered via bulk carrier.

Dampier (King Bay) to Other Japanese Ports (volume - 6 MT; value - \$4 billion)

⁸ The Maritime Executive, <https://maritime-executive.com/article/port-of-newcastle-world-s-largest-coal-port-looks-for-new-cargoes>

⁹ People's Daily Online, <http://en.people.cn/n3/2021/0125/c90000-9812750.html>

Dampier's primary exports to ports within Japan are largely composed of iron ore. This is consistent with Japan's focus on the transportation of dry goods via bulk carrier.

Port Hedland to Tianjin, Tsingtao, Rizhao and Other Chinese Ports (combined volume - 191 MT; combined value - \$26 billion)

The port of Tianjin is the largest port in Northern China and the main maritime gateway to Beijing. It is the largest man-made port in mainland China, consisting of 121 square kilometres of land surface and 151 production berths.

The Port of Tsingtao is located at the entrance of Jiaozhou Bay on the south coast of the Shandong Peninsula in Eastern China. It is a major nodal city of the Belt and Road Initiative connecting Asia with Europe.

The Port of Rizhao is a natural deep-water seaport in the Shandong Province of China. It is approximately the tenth-busiest port in China. Much like Tsingtao, the port is an essential seaport of the Belt and Road Initiative as a major bridgehead of the New Euro-Asian continental bridge.

Port Hedland carries out large exports by weight to a variety of Chinese ports, although these largely have the same composition between locations, consisting mainly of iron ore, but also other mineral substances.

General cargo ships/container carriers

Melbourne to Singapore (volume - 1MT; value - \$3 billion)

The Port of Melbourne is located in the state of Victoria. As Australia's largest port, it is estimated to contribute approximately \$6 billion to the state's economy. It facilitates approximately one-third of the nation's container trade.

Consistent with Singapore's focus on container trade, the majority of exports from Melbourne are delivered via container and general cargo ships. These shipments are noted to encompass both processed metals (Zinc) and agricultural products. A key export, however, is petroleum oils and oils from bituminous minerals, which are delivered via tankers.

Dampier (King Bay) to Singapore (volume - 2MT; value - \$2 billion)

Singapore is the world's second-busiest container port by volume, and the busiest bunkering port in the world. Additionally, it is the world's busiest transshipment port. The majority of ships that pass between the Indian Ocean and the Pacific Ocean go through the Singapore Strait.¹⁰

Dampier's primary exports to Singapore differ somewhat from its trade with other locations, with an increased focus on the export of petroleum and machinery, including the export of vessels. This has necessitated a greater diversity of ship types, including both tankers and general cargo ships.

Fremantle to Singapore (volume -1MT; value - \$3 billion)

Fremantle is Western Australia's largest and busiest general cargo port by volume, located adjacent to the Perth metropolitan region. It handles a large volume of sea containers, vehicle imports, livestock exports, cruise shipping and naval visits.

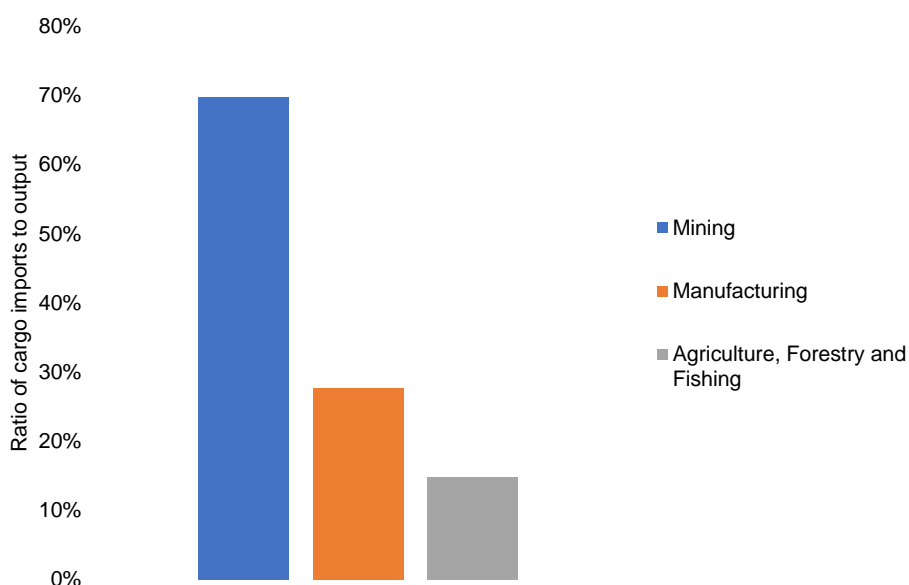
Exports from Fremantle to Singapore are notably similar to those from Melbourne, facilitating both general cargo ships and tankers to deliver petroleum oils, processed metals (Zinc) and agricultural products.

¹⁰ World Shipping Council, <https://www.worldshipping.org/top-50-ports>

What industries rely heavily on cargo exports?

Unsurprisingly, mining has the highest reliance on exports with 70 per cent of outputs shipped overseas, followed by manufacturing (28 per cent) and agriculture (15 per cent).

Figure 6: Cargo export reliance by industry - ANZSIC 1-digit industry level, 2019-20



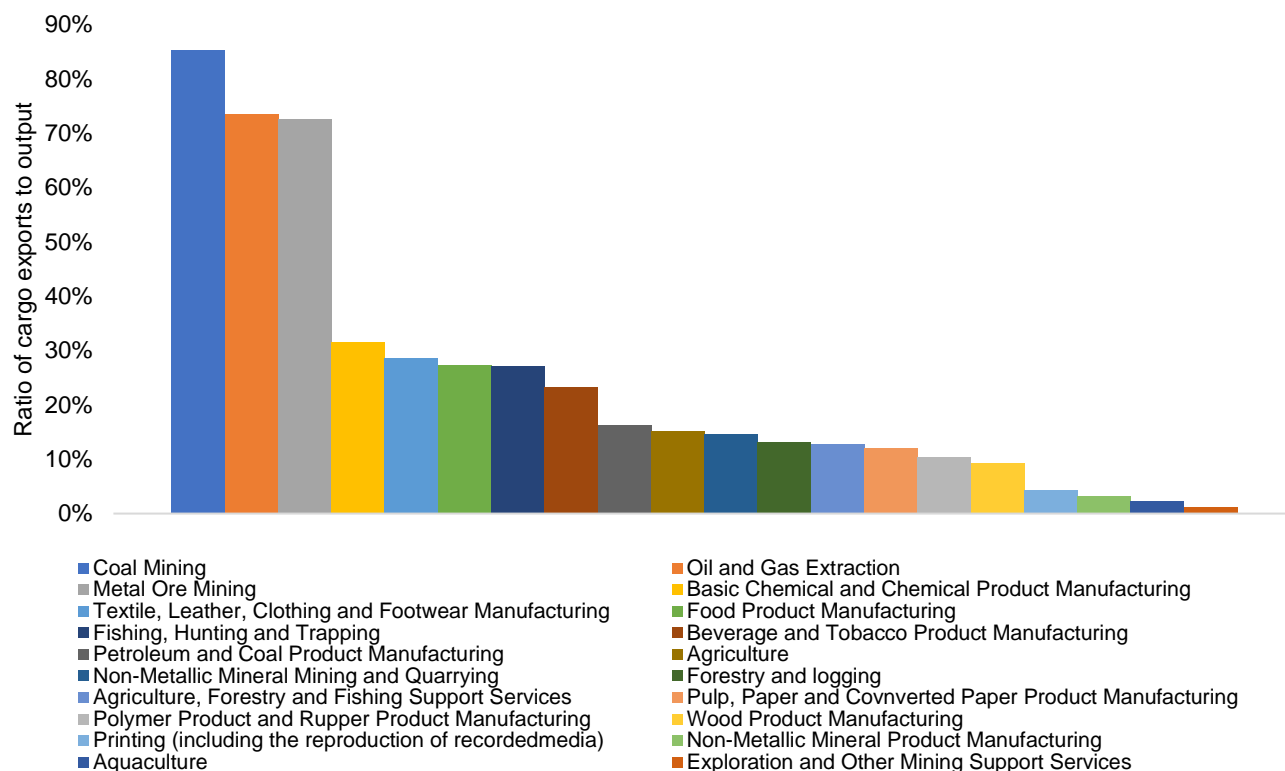
Source: ABS input-output tables; PwC calculations

At a more granular level, 85 per cent of the coal mining output is exported as on-shore coal demand has been subdued reflecting the decreasing numbers of coal-fired power stations in operation in Australia. Oil and Gas extraction and metal ore mining stands at around 73 per cent as Australia has on-shore metal producers such as BlueScope and on-shore refineries.

In manufacturing, chemical production and food and fibre industries are the key exporters in Australia, with 23 to 32 per cent of products are shipped overseas.

In agriculture, forestry and fishing, it is fishing that has the highest reliance on export at 27 per cent.

Figure 7: Cargo export reliance by industry – ANZSIC 2-digit industry level, 2019-20



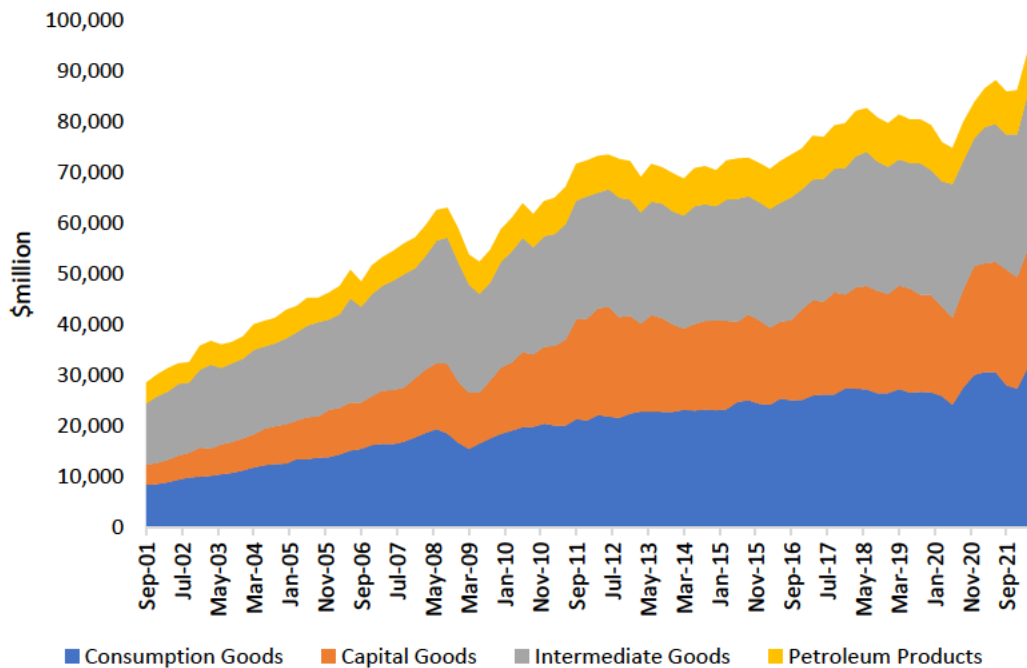
Source: ABS input-output tables and PwC calculations

2.1.2 Imports

In the 2020-2021 year, Australia imported approximately 97 megatonnes by sea, worth \$339 billion.¹¹ Consumption goods account for 35 per cent (or \$119 billion) of Australia's merchandise imports, followed by intermediate goods (31 per cent or \$104 billion), capital goods (25 per cent or \$84 billion) and then petroleum products (9 per cent or \$30 billion). This implies Australia relies heavily on the global supply chains and shipping for day-to-day essentials and to support core industrial production.

Figure 8 Australia's merchandise import 2001-02 to 2021-22, constant prices (quarterly)

¹¹ National Freight Data Hub, <https://datahub.freightaustralia.gov.au/insights/imports-exports/>

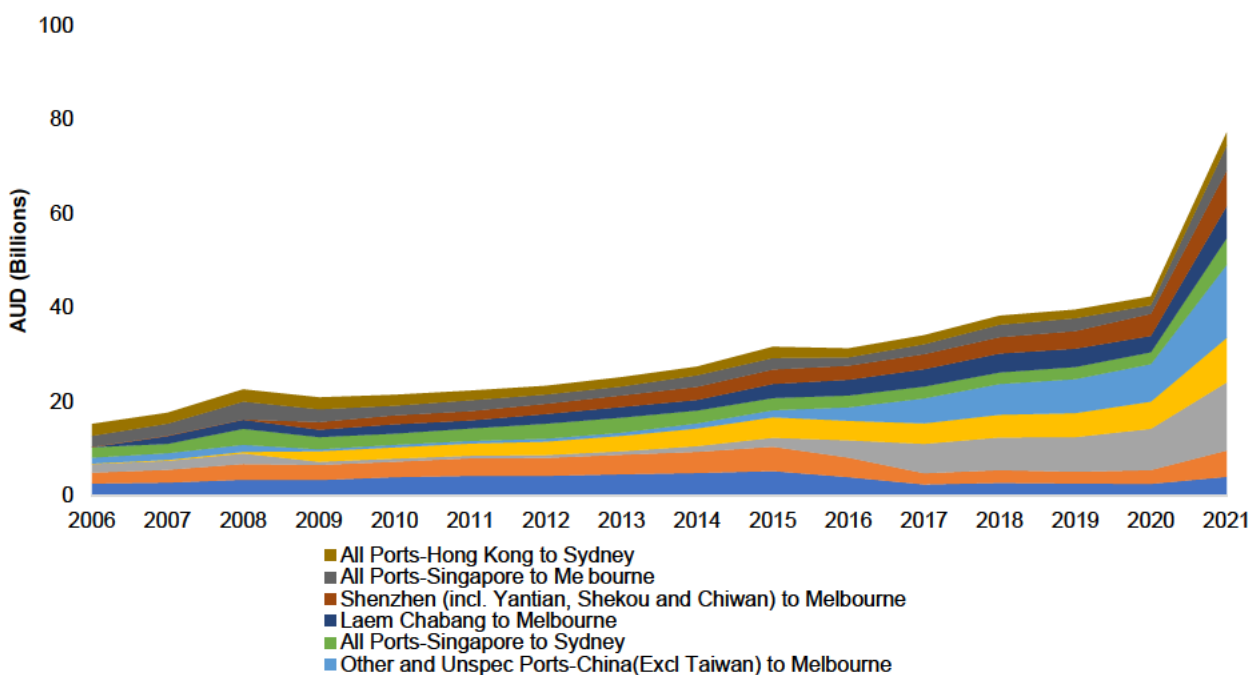


Source: ABS input-output tables and PwC calculations

Top ten import trade routes (2006-2021)

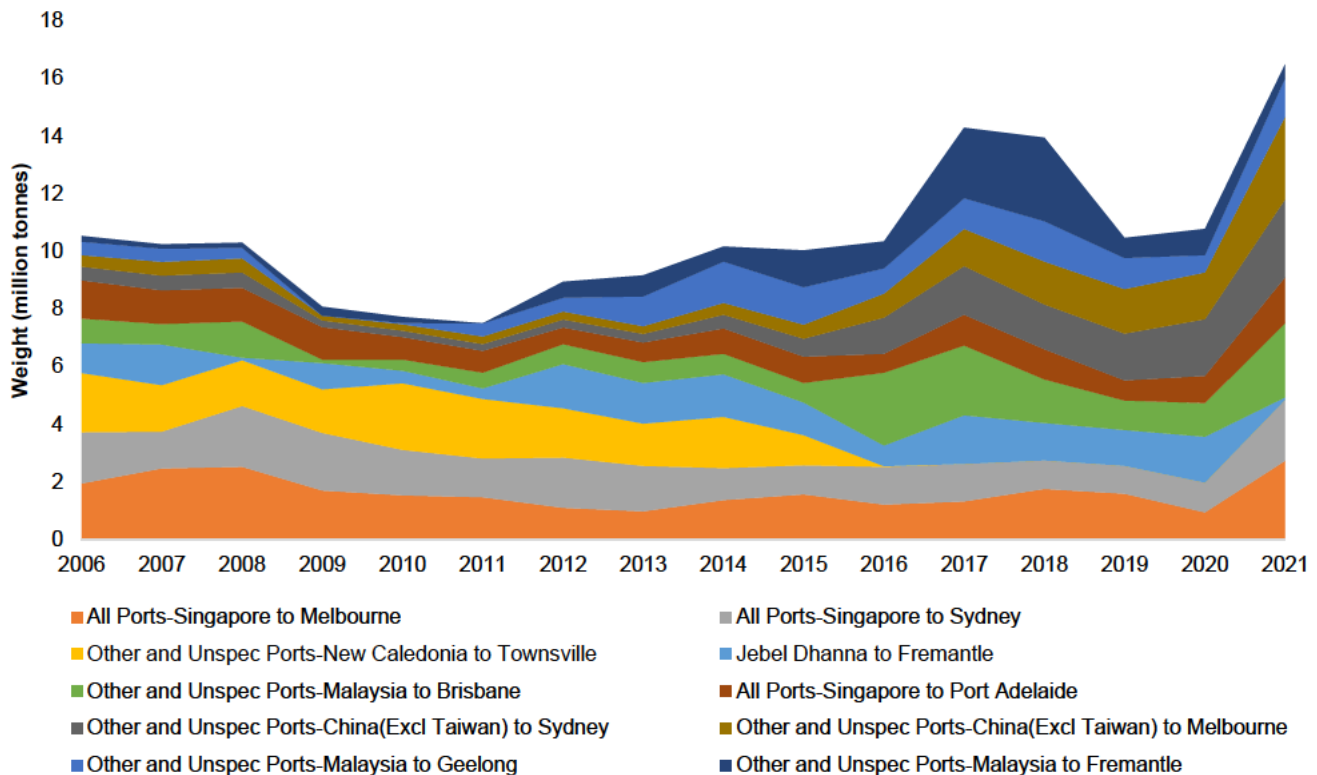
Trade routes with China that import a large range of manufacturing goods for final consumptions, intermediate inputs and capital formation account for 7 out of the 10 largest trade routes by value. The remaining three include imports from Singapore such as petroleum products, electronics and other manufactured consumables (2 out of 3) and imports from Laem Chabang in Thailand with a focus on vehicles. Top ten trade routes by weight are slightly different from the top ten by value, with some trade routes importing manufacturing goods replaced by natural resources imports from Australia's close neighbouring countries in Southeast Asia and the broader Asian region.

Figure 9 Top ten import trade route by value, 2006-2021



Source: ABS customised trade data and PwC calculations

Figure 10 top ten import trade route by weight, 2006-2021



Source: ABS customised trade data and PwC calculations

General cargo ships/container carriers

Shanghai to Sydney (2021: volume - 0.5 MT; value - \$4 billion)

Shanghai is the world's busiest container port, located on the southern estuary of the Yangtze River. It serves the provinces of Anhui, Jiangsu, Zhejiang and Henan provinces with its dense population, strong industrial base and developed agricultural sector.

Sydney is one of Australia's key trade gateways and supports the movement of millions of tonnes of freight. This includes container cargo, car imports and roll on roll off cargo, general oversize and project cargo, bulk liquids and gas, agriculture construction and mining products.

Imports from Shanghai are largely composed of electronic goods, including consumables and those used as intermediate products and for developing infrastructure. These are largely delivered using general cargo and container ships.

Shanghai to Melbourne (2021: volume - 0.7 MT; value - \$6 billion)

The Port of Melbourne is the largest containerised and general cargo port in Australia. It is located in Melbourne Victoria. There are currently around 25 container shipping lines that call at the Port of Melbourne, amounting to 3000 commercial ship visits each year.¹² The port handles in excess of 2 million TEU per year. Over a third of the ships visiting the port in 2018-2019 were servicing the container trade.

¹² Port of Melbourne, <https://www.portofmelbourne.com/port-operations/commercial-shipping/#:~:text=There%20are%20currently%20around%2025,markets%20all%20around%20the%20globe.>

Similar to Sydney, imports to Melbourne from Shanghai are largely composed of electronics, but also include fully manufactured consumables. These are delivered via general cargo and container ships.

Other Chinese Ports to Sydney (2021: volume - 3 MT; value - \$14 billion)

A variety of other Chinese ports not mentioned thus far also engage in sizeable trade with Australian ports. These include the Port of Guangzhou, the Port of Qingdao, the Port of Dalian, the Port of Xiamen and the Port of Yingkou.

The focus of imports to Sydney from these ports mirrors those goods traded from other major Chinese ports, largely including consumer-level electronic manufactures and related intermediate goods.

Shenzhen to Sydney (2021: volume - 0.9 MT; value - \$10 billion)

The Port of Shenzhen is located in the south of the Pearl River Delta in China's Guangdong Province. It serves over 50 global shipping lines, has over 130 international routes, and services nearly 10,000 vessels annually. Shenzhen has over 250 kilometres of coastline and is part of the Hong Kong-Shenzhen Western Corridor used for road transport across the provinces' border.

Exports to Sydney from Shenzhen largely include consumer-level manufactures, such as computers and printers. These are transported using container ships and general cargo ships.

Other Chinese Ports to Melbourne (2021: volume - 3 MT; value - \$16 billion)

As above, the majority of imports to Melbourne from Chinese ports focus on consumer-level manufactures delivered by general cargo and container ships. Notably, these include both electronic products as well as manufactured textile items.

Singapore to Sydney (2021: volume - 2 MT; value - \$6 billion)

Imports to Sydney from Singapore are largely composed of petroleum oils, but also include food consumables and intermediate products, as well as manufactures. These are mostly delivered using general cargo and container ships.

Laem Chabang to Melbourne (2021: volume - 0.9 MT; value - \$7 billion)

Laem Chabang is a port city in Thailand. The city serves as a major stop on the coastal highway linking Pattaya and Bangkok. It is Thailand's largest port and is capable of handling the largest (Post-Panamax) vessels. The port has easy access to Bangkok and proximity to the Gulf of Thailand.

Imports to Melbourne from Laem Chabang are particularly focused on vehicles, including both those for the transport of goods and people. Other electronic items are also imported.

Hong Kong to Sydney (2021: volume - 0.1 MT; value - \$3 billion)

Hong Kong is a major deep-water seaport located in the Victoria Harbor of South China. It receives nearly 0.5 million vessels annually, over 250 million tons of cargo, and over 25 million passengers annually.

Imports from Hong Kong to Sydney largely mirror those from other Chinese ports, focusing on consumer-level electronic manufactures and intermediate products delivered via general cargo or container ship.

Bulk carrier

New Caledonia to Townsville (2010: volume - 2.3 MT; value - \$1 billion)

New Caledonia is a French territory comprising dozens of islands in the South Pacific. Its principal cargo terminal is located in Noumea.

The Port of Townsville is a seaport in Townsville, Queensland, located south of the mouth of Ross Creek and north of the Ross River. It is Northern Australia's largest container and automotive port, and the country's leading exporter of copper, zinc, lead, sugar, fertiliser and molasses.

Imports from New Caledonia to Townsville are largely composed of iron ore agglomerates and products of nickel metallurgy, delivered via bulk carrier and cargo ship.

Tankers

Shenzhen to Melbourne (2021: volume - 0.9 MT; value - \$8 billion)

Imports from Shenzhen to Melbourne are mostly composed of petroleum, delivered via tanker, and consumer-level manufactures, delivered via cargo ships and container ships.

Singapore to Melbourne (2021: volume - 3 MT; value - \$5 billion)

Imports from Singapore to Melbourne are largely petroleum oils, delivered by tanker, but also include capital goods, such as water vessels for transport, and intermediate goods, such as cocoa paste.

Jebel Dhanna to Fremantle (2020: volume - 1.6 MT; value - \$754 million)

Jebel Dhanna is a large port located in the United Arab Emirates, on the Arabian Gulf. It predominantly serves crude oil tankers, although has the capacity to support heavy load carriers and offshore supply ships.

While imports from Jebel Dhanna to Fremantle are largely composed of petroleum oils, delivered via tanker, imports also include glass containers and alloyed steels, delivered via general cargo ships.

Malaysia to Brisbane (2021: volume - 3 MT; value - \$2 billion)

Malaysia houses a number of large ports, including Port Klang, Johor Port, Kuantan Port, Bintulu Port and Penang Port

The port of Brisbane is located on the east coast of Queensland, and is the largest port in the state. As a cornerstone of the Queensland economy, it undertook 31 million tonnes of trade in 2019/2020, including 1.3 million containers, 126 customers and 2,392 vessel visits.¹³

Imports to Brisbane are largely composed of petroleum oils delivered by tanker, though also include urea fertilisers and plywood.

Singapore to Port Adelaide (2021: volume - 2 MT; value - \$2 billion)

Port Adelaide is a medium-sized port located in the Outer Harbour of Adelaide, South Australia. Principally, it imports grains, limestone, petroleum, motor vehicles, metals, cement and fertiliser.

This is reflected in its imports from Singapore, which include mainly petroleum oils, chemical products and cement copper.

Malaysia to Geelong (2021: volume - 1 MT; value - \$1 billion)

¹³ Trade Statistics for Queensland Ports, [https://www.tmr.qld.gov.au/-/media/busind/Transport-sectors/Ports/Trade-statistics/Trade-Statistics-for-Queensland-Ports-2020.pdf?la=en#:~:text=The%20Queensland%20port%20system's%20total,tonnes\)%20to%20312.8%20million%20tonnes.](https://www.tmr.qld.gov.au/-/media/busind/Transport-sectors/Ports/Trade-statistics/Trade-Statistics-for-Queensland-Ports-2020.pdf?la=en#:~:text=The%20Queensland%20port%20system's%20total,tonnes)%20to%20312.8%20million%20tonnes.)

Geelong is a medium-sized port and the second largest port in the state of Victoria. It handles close to 12 million tonnes of cargo and more than 600 vessel visits each year.¹⁴ It is located 75 kilometres southwest of Melbourne and comprises 15 berths across two primary precincts. Principal imports to Geelong from Malaysia include petroleum products, as well as urea fertiliser.

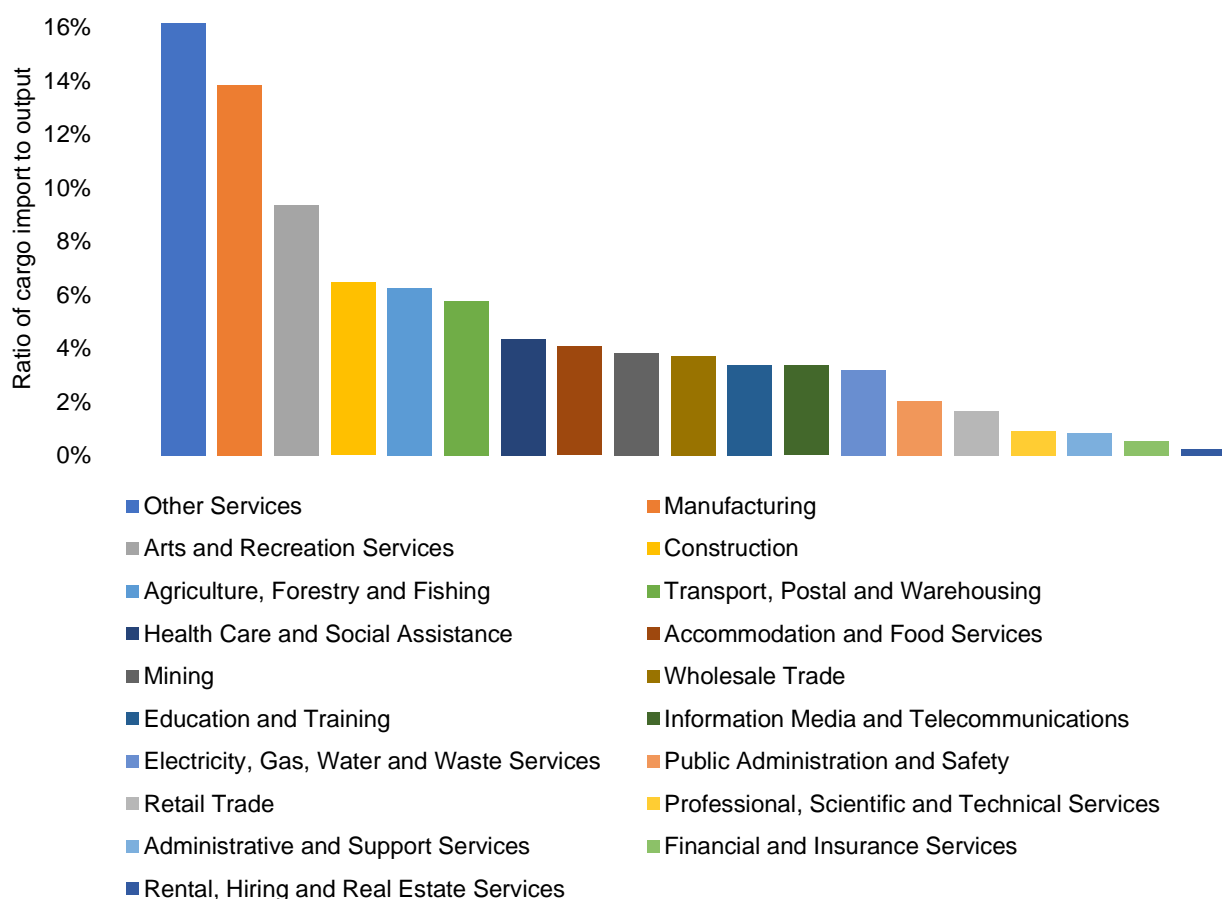
Malaysia to Fremantle (2021: volume - 0.5 MT; value - \$0.5 billion)

The port of Fremantle is Western Australia's largest and busiest general cargo port by volume. The primary imports to Fremantle from Malaysia, much like Geelong, include petroleum products and urea fertiliser.

What industries rely heavily on cargo imports?

Other services (including repairing and maintenance services) industries rely the most on cargo imports, accounting for 16 per cent of output. This implies a large number of parts and accessories for our vehicles, machinery, ships, trains and airplanes are sourced overseas. Manufacturing is ranked second at 14 per cent. This implies the relatively high reliance of our manufacturing sector on the global supply chain. This is followed by arts and recreation services that relies on overseas equipment and products (at 9 per cent) for the industry's output. Construction relies on overseas materials for around (6 per cent) of the industry's output. These cargoes are often shipped by general cargo ships or container carriers.

Figure 11 cargo import reliance by industry – ANZSIC 1-digit level



Source: ABS input-output tables

¹⁴ Port of Geelong, <https://geelongport.com.au/>

What goods are the Australian industries importing to support production?

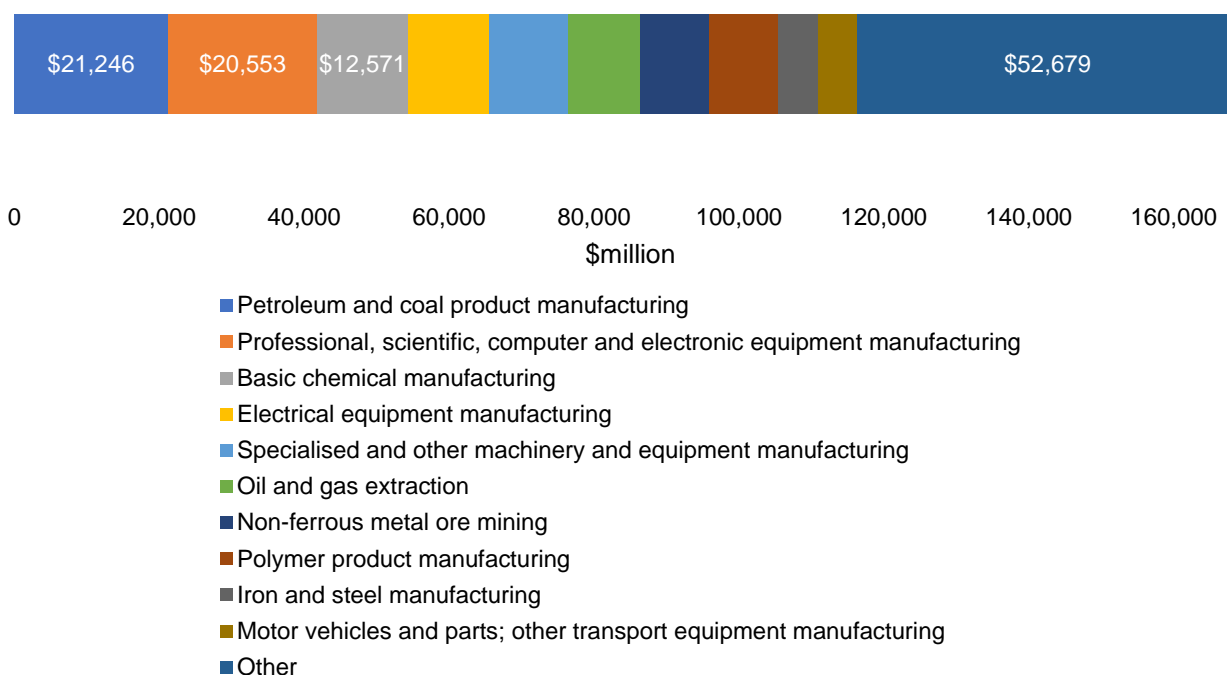
Australian industries imported more than \$160 billion of goods in 2019-20 to support industry operations and production. These goods are inputs in the production of other goods including final goods, also called intermediate inputs. Intermediate inputs often follow the Leontief production function or fixed proportions production function. This implies there is no substitute for the specific type of intermediate input. For example, intermediate goods "tyres" and "steering wheels" are used in the production of a particular type of automobile - without the exact fit of tyres or steering wheel the whole automobile production line will stop. Most production lines require parts with exact specifications, so the example is scalable across many manufacturing product lines, for example, medical instrument manufacturing, or electrical component manufacturing product lines would also follow the Leontief production function.

- Petroleum and coal product manufacturing¹⁵ accounts for the largest share of imported cargo by value, at 13 per cent. Petroleum and coal products are used by many Australian industries as inputs to other products. Extended disruption to supply/shipping of these products would cause significant disruption to farms, factories, construction, and transport. These products are often shipped by tankers.
- Professional, scientific, computer and electronic equipment accounts for the second largest share, at 12 per cent. The equipment is also used in mining, manufacturing, construction, transport and service sectors and is key to the efficient operation of many of these sectors. These products are often shipped by general cargo ships or container carriers.
- Basic chemicals account for 7 per cent of the imported goods, basic chemicals are widely used in Australia's mining, manufacturing, and construction industries. These products are often shipped by general cargo ships or container carriers.
- Electrical equipment account for 6 per cent of the goods imported into Australian ports and is mostly used in the construction industry. These products are often shipped by general cargo ships or container carriers.
- Specialised machinery and equipment account for 6 per cent of imported goods and are mostly used in the mining industry – these products are large, expensive and critical to the efficient operation of Australia's mines. These products are often shipped by general cargo ships or container carriers.
- The remaining category is oil and gas extraction (6 per cent), non-ferrous metal ore mining (6 per cent), polymer product (6 per cent), iron and steel manufacturing (3 per cent), and motor vehicles and parts, and other transport equipment (3 per cent).

Extended disruption to any of these supplies could have material and significant implications for industry output ranging from reduced capacities to shutdown of the key industries. If Australia proves an unreliable part of global supply chains (assuming a series of disruptions were to occur) production will likely switch to other parts of the world.

Figure 12 top ten imported cargo as intermediate in 2019-20

¹⁵ Coal Product manufacturing - this class consists of units mainly engaged in further refining heavy and light oil components into petroleum and coal products not elsewhere classified, using oil and grease base stocks, as well as synthetic organic compound base stocks. This class also includes units mainly engaged in distilling coal tars and/or manufacturing cyclic organic hydrocarbon intermediate compounds from refined petroleum or natural gas.



Source: ABS input-output tables

2.1.3 Case studies based on vessel level data

To better understand how the strategic fleet can help with the current seaborne trade, PwC selected a number of case studies by six ship types (bulk carrier, container carrier, general cargo ship, tanker, vehicle carrier and LNG carrier) based on Lloyd's list data to demonstrate the key movement trajectories by ship type. These six ship types are picked as they account for 74 per cent of total port calls (excluding tugs, landing craft and dredgers) in Australia in 2021.

Bulk carrier

The key trade trajectories for bulk carriers often involve WA/NSW/Queensland, China, India and Singapore. WA/NSW/Queensland are often the export origins for key mining resources while China and India are the export destinations. Singapore often plays the role as the transit hub. Below are two examples at vessel level in 2021.

Bai An Hai is a Chinese flagged bulk carrier. On January 1, 2021, it arrived in Port Hedland (Australia) from Lombok Strait (Indonesia). It stayed in Port Hedland for 1 day and then sailed for Ningbo (China). On January 16, 2021 it arrived in Ningbo anchorage and spent 3 days before reaching Port Ningbo. On the next day, it sailed for Zhangjiagang (China). After spending 2 days in Zhangjiagang it then sailed to Singapore (stopping for one day) and then reached Richards Bay (South Africa) on February 26, 2021.

Aanya is a Panamanian flagged bulk carrier. On August 20, 2021, it arrived in Port Dampier Anchorage (Australia) from Lombok Strait (Indonesia). It moved into Port Dampier on the next day and stayed there for another two days before leaving for Caofeidian (China) through Lombok Strait. On September 7, it arrived in Caofeidian but left for Abbot Point (Australia) after four days. It arrived in Abbot Point on September 26 2021 but left the next day heading to Krishnapatnam (India) and Dhamra (India) through Singapore. It left for Richards Bay (South Africa) after stopping at the two ports in India.

It seems typical for bulk carriers to go to South Africa to pick up mining resources after leaving China and/or India.

Container carrier

The key trade trajectories of container carriers are more diverse and complicated given the diversity of goods they can carry. However, key stops often include China, Korea, Southeast Asia, and the key capital cities in Australia include Brisbane, Sydney, Melbourne (Eastern route) and Perth (Western route). Below are two examples at vessel level in 2021.

Kokopo Chief is a Hong Kong flagged container carrier. It travelled both between the South Pacific Islands including (Fiji, New Caledonia, Vanuatu etc.) and Australian major capital cities in eastern coast and between China/Korea and Australian major capital cities in eastern coast in 2021. Below is a representative extract of its movement in 2021.

On June 1, 2021, it arrived in Melbourne before travelling through a number of South Pacific islands including New Caledonia, Vanuatu, Fiji, American Samoa, Samoa and Tonga. It then travelled to Sydney and Brisbane and going through the same South Pacific islands before leaving for China on July 4, 2021. It stopped at a number of ports in China and Korea before returning back to Port Kembla on October 5, 2021. It continued travelling along the eastern coast until reaching Melbourne again on October 8, 2021.

MSC Aditi is a Liberian flagged container carrier. It travelled between Southeast Asia, China, Perth, Brisbane, Sydney and Melbourne in 2021. Below is a representative extract of its movement in 2021.

On August 21, 2021 it arrived in Perth from Singapore and then left for China through Malaysia and Singapore. It stopped in a few ports in China and then returned to Australia. It travelled through the eastern coast and stopping in Brisbane, Sydney and then reached Melbourne on October 18, 2021.

General cargo ship

Similar to container carriers, the key trade trajectories of general cargo ships are also very diverse. Key stops often include China, Korea, Japan, Southeast Asia and various Australian ports. Below is an example at vessel level in 2021.

Merlin Arrow is a Serbian flagged general cargo ship. It travelled between China (including Taiwan), Japan, Korea, Singapore and Australia in 2021. Below is a representative extract of its movement in 2021. On March 15, 2021, it arrived in Portland from Singapore. It then travelled along the Victorian coast and reached Melbourne on March 30 2021. It then left Melbourne for China, Korea and Japan before returning to Brisbane through Taiwan. It then further travelled to Newcastle with an arrival date of July 1, 2021.

Tanker

The movements of tankers to and from Australia often revolve around Singapore. Below is an example at vessel level in 2021.

Torm Sara is a Singaporean flagged tanker. On February 3, 2021, it arrived in Brisbane from Singapore. It then further travelled to Sydney after spending 5 days in Brisbane. After staying in Sydney for 2 days it left for Singapore on February 21, 2021.

Vehicle carrier

Unsurprisingly, vehicle carriers often originate the trips in economies with strong vehicle manufacturing capabilities such as China, Korea and Japan. Vehicle carriers often have multiple stops on the way to Australia including South Pacific islands and New Zealand. Below is an example at vessel level in 2021.

Turandot is a Singaporean flagged vehicle carrier. On May 27, 2021, it arrived in Port Kembla (Australia) from Auckland (New Zealand). Before Auckland, it had stopped multiple times in Korea, China and Japan as well as Suva (Fiji). Within Australia, it further travelled to Brisbane. It then left for Shanghai (China), then Korea and Japan before returning to Brisbane again on July 4, 2021.

LNG carrier

The movements of LNG carrier tend to be less complex, often directly from where natural gas is produced (mostly WA) to where demand sits (mostly China, Korea and Japan). Singapore often acts as a transit hub for LNG carriers entering and leaving Australia. Below are two examples at vessel level.

Dapeng Sun is a Hong Kong flagged LNG carrier. On June 17, 2021, it sailed for Guangdong Terminal (China) from Dampier (Australia). It arrived in Guangdong Terminal on June 24, 2021 and left for Singapore in the next day. It arrived in Singapore on June 29, 2021 and then returned to Dampier on July 8, 2021.

Asia Energy is a Bahamian LNG carrier. On February 4, 2021, it sailed for Singapore from Ashburton (Australia). It arrived in Singapore on February 11, 2021 and then returned to Ashburton on February 28, 2021. It left for Japan and Korea on the next day and returned to Ashburton again on March 29, 2021.

2.1.4 Port pairing in international trade

Based on the case studies from the Lloyd's data, two-way port pairing often takes place in LNG or oil related transportation where ships often arrive and leave between two ports.

The most likely two-way port pairing in the above trade routes is Singapore to Melbourne. Two-way port pairing sometimes also takes place in iron ore and other bulk mineral trade and as a result below trade routes could also be port pairs: Port Hedland to Ningbo, Dampier (King Bay) to Shanghai, Port Walcott to Shanghai, Newcastle to Other Japanese Ports, Port Walcott to Oita, Port Hedland to Tangshan, Dampier (King Bay) to Other Japanese Ports, and Port Hedland to Tianjin, Tsingtao, Rizhao and Other Chinese Ports.

2.1.5 Coastal trade

Coastal shipping volumes have plateaued over recent decades in terms of total volumes shipped, with road and rail tending to be the beneficiary of additional volumes. Shipping can present a relatively low-cost transport option of certain commodities and routes and is a relatively emission efficient form of freight transportation.

However, transport times are longer than road or rail. There are also constraints in terms of availability of port-landside infrastructure suitable for specific tasks. The distance from the commodity origin and destination to the port also impacts on land-side transport cost decisions.

Coastal shipping volumes have grown by approximately 50 per cent over the past five decades, from around 72 billion tonne kilometres in 1970–71 to around 120 billion tonne kilometres in 2018-19.

Coastal shipping provides freight for a range of goods including: Bauxite and alumina; Iron ore; Other dry bulk products; Crude oil; Petroleum products; Other bulk liquids; Inter-capital container freight; and, Bass Strait non-bulk freight.

Coastal shipping is the only mode of transport for major goods movement between Tasmania and the mainland (noting that some freight is also transferred by air).

Cost is a key factor in modal choice and is highly dependent on the route and the commodity. Where the distance is great and the origin and destination are relatively close to a port, shipping certain commodities can be financially advantageous relative to land transport alternatives.¹⁶

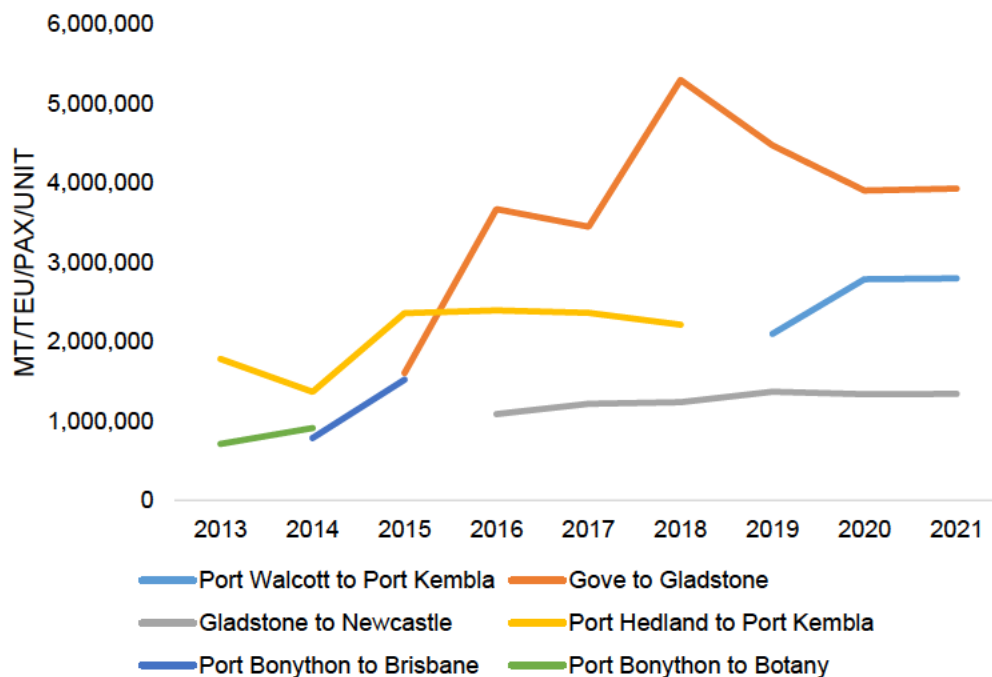
- For example, indicative freight rates (2020):
 - Steel from Port Kembla to Hastings costs \$57/tonne by rail - \$32/tonne by sea;
 - Sugar from Mackay to Yarraville \$68/tonne by rail – Shipping \$46/tonne; and,
 - Containers Melbourne to Fremantle rail \$2500/TEU - Shipping \$1700/TEU.

¹⁶ Ports Australia fact sheet - https://uploads-ssl.webflow.com/5b503e0a8411dabd7a173eb7/60934f678088e29eeb26074a_Ports%20Australia%20Coastal%20Shipping%20Factsheet.pdf

Top 3 trade routes under temporary licences (2013-2021)

The key coastal trade routes under temporary licences in the past 10 years include Port Walcott to Port Kembla, Gove to Gladstone, Gladstone to Newcastle, Port Hedland to Port Kembla, Port Bonython to Brisbane, Port Bonython to Botany (Figure 13).¹⁷ The largest trade routes by volume are all mining related. The volume in the Top 3 trade routes accounts for 9 per cent to 76 per cent of the total coastal trade volume under temporary licences recorded by the Voyage Report between 2013 and 2021.

Figure 13 Top 3 coastal trade routes by volume (temporary licences), 2013-2021



Source: calculated based on Voyage Reports

Bulk carrier

Port Walcott to Port Kembla (2021: 2.8 million MT/TEU/PAX/UNIT)

Port Walcott contains the port facilities of Cape Lambert, which along with the neighbouring ports at Port Hedland and Dampier, are the three major iron ore exporting ports in the Pilbara region.

Port Kembla is an international trade gateway for bulk agricultural, construction and mining industries. It is New South Wales' largest motor vehicle import hub and home to the state's largest grain export terminal and second largest coal export port.

The major commodity being transported via this route is iron ore, related to Rio Tinto Marine and BlueScope Steel (AIS) Pty Ltd. This route is mostly to supply BlueScope Steel with raw materials. The ships used are bulk carriers.

Gove to Gladstone (2021: 3.9 million MT/TEU/PAX/UNIT)

Gove bauxite is shipped internationally as well as domestically to supply Queensland Alumina Limited and Yarwun refineries in Gladstone, Queensland. These refineries produce alumina as feedstock for our Australian aluminium smelting operations and for sale on the international market.

¹⁷ It is worth noting that this analysis only considers flow under temporary licenses as granular data on general licenses and intrastate flow is not publicly available. There is some high-level data available in *Australian sea freight 2018-19* report on top ten coastal trade flows but they are not sufficient to provide a detailed breakdown of the cargo in individual trade flows.

Bauxite is shipped from Gove to Gladstone to supply raw materials, all managed by Rio Tinto Marine. The ships used are bulk carriers.

Gladstone to Newcastle (2021: 1.3 million MT/TEU/PAX/UNIT)

The commodity shipped in this route is dominated by magnetite, cement and alumina. This route is to supply the mining products produced in Gladstone to the market. The ships used include bulk carriers and Pneumatic Cement Vessels.

Port Hedland to Port Kembla (2018: 2.2 million MT/TEU/PAX/UNIT)

Similar to the route from Port Walcott to Port Kembla, this route is mostly to supply BlueScope Steel with raw materials. The commodity transported is dominated by iron ore and manganese. The ships used are bulk carriers.

Tanker

Port Bonython to Brisbane (2015: 1.5 million MT/TEU/PAX/UNIT)

Port Bonython is the location of a deepwater port, gas fractionation plant and diesel storage facility west of Point Lowly in the Upper Spencer Gulf region of South Australia. This route mostly supplies crude oil to Brisbane. The ships used are oil tankers.

Port Bonython to Botany (2014: 0.9 million MT/TEU/PAX/UNIT)

Similar to the route from Port Bonython to Brisbane, this route mostly supplies crude oil to Sydney. The ships used are oil tankers.

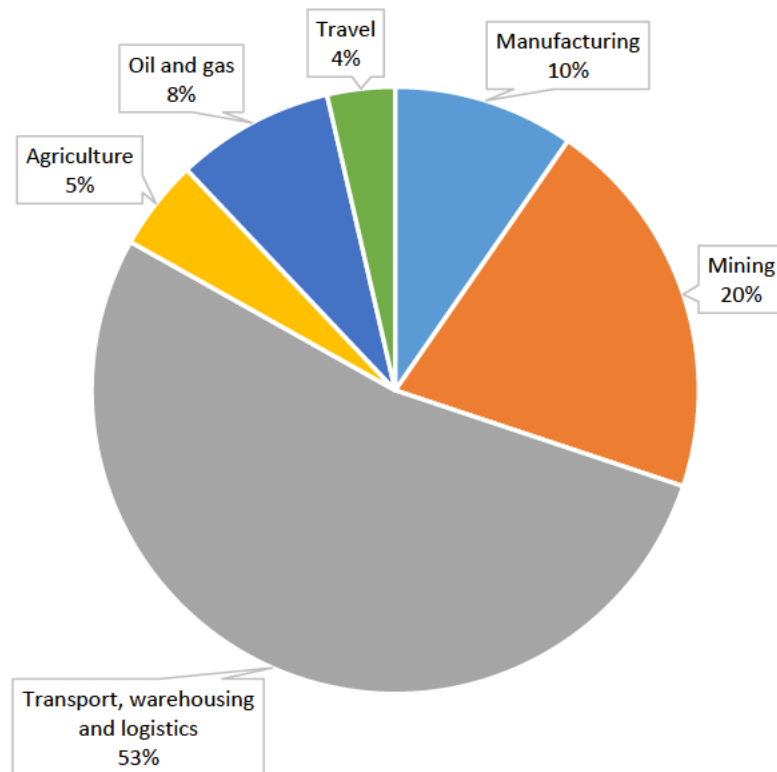
Port pairing in coastal trade

There are no obvious two-way port pairings in high volume coastal trade routes based on the temporary licence voyage report.

Who relies on coastal trade under temporary licences?

There are 83 organisations that engaged in coastal trading in Australia under temporary licences from 2012 to 2022. Of the 83 organisations, more than half (53 per cent) are professional shipping operators, followed by mining (20 per cent). Manufacturing accounted for 10 per cent of coastal trade by industry type. Oil and Gas and Agriculture accounted for 8 per cent and 5 percent respectively.

Figure 14 Coastal trading under temporary licence by industry



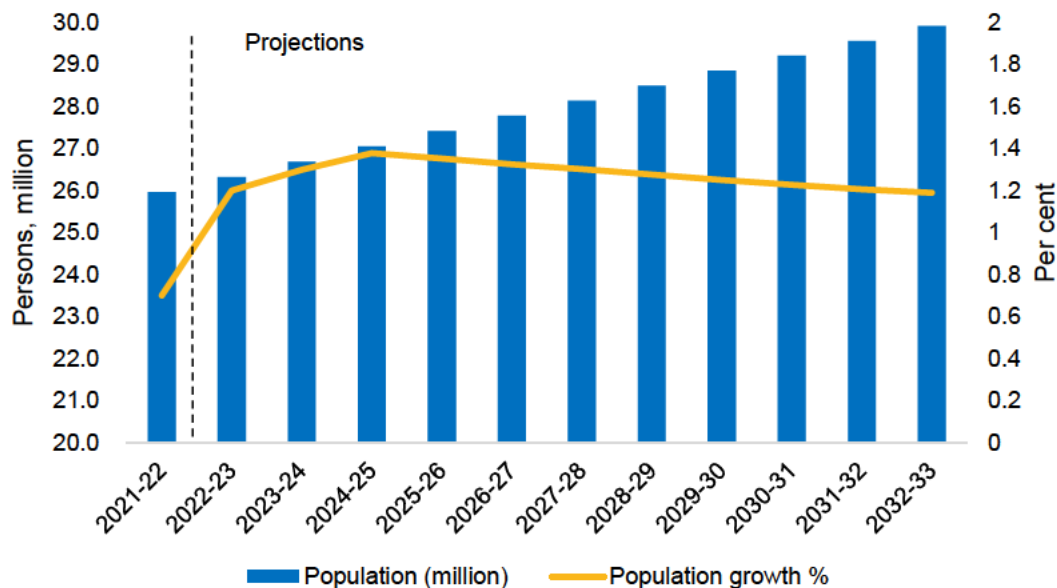
Source: calculated based on Voyage Reports

2.2. Projections

At a macroeconomic level seaborne trade is generally correlated with economic activity in Australia and Australia's major trading partners. Domestically, population, participation and productivity are the basic building blocks of GDP growth. Australia's population growth is recovering following the border restrictions implemented during the pandemic. Population growth is projected to peak at around 1.4 per cent in 2024-25, before moderating to around 1.2 per cent in the medium term (see Figure 15). The population will reach around 30 million by 2033.

As population growth slows from the rates seen in recent decades (average of 1¾ per cent per year), this has pushed down medium-term GDP growth in the economy. Treasury projects that medium term GDP growth will ease to 2½ per cent, down from 2¾ per cent in the previous Budget, as productivity growth assumptions have also declined to 1.2 per cent from 1.5 per cent. This will see the demand for imports (generally related to gross national expenditure) in Australia moderate over the medium term, relative to demand in previous decades.

Figure 15 Australia's population projections, Budget 2022-23



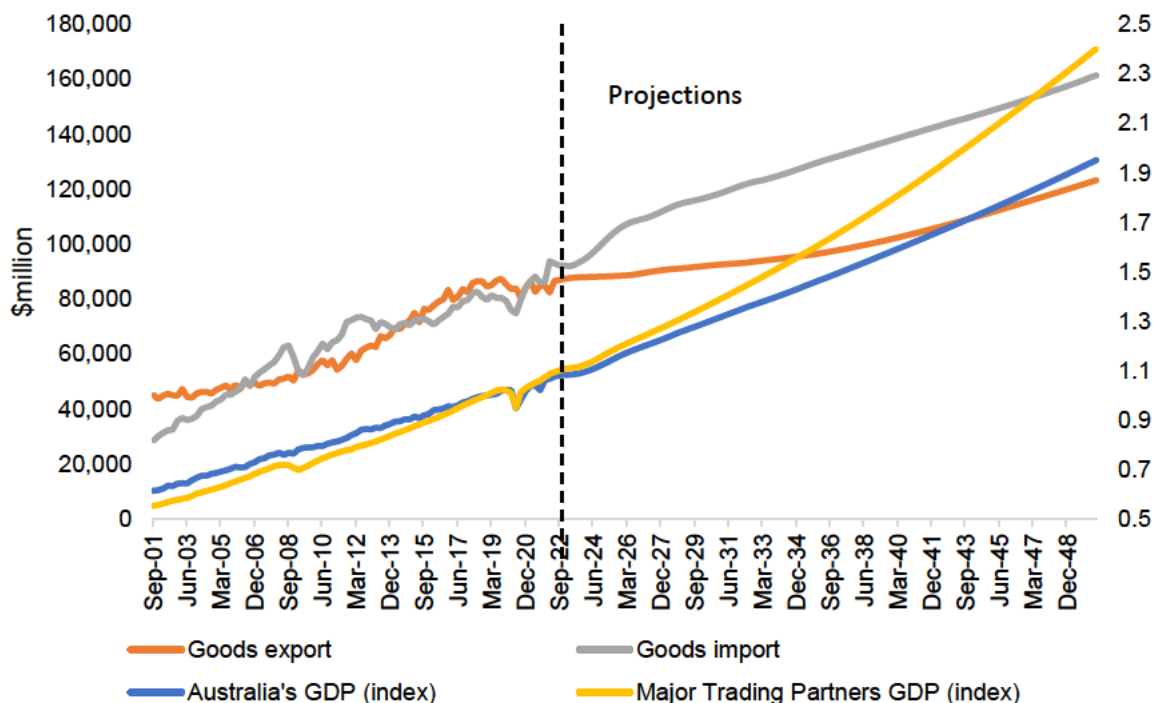
Source: Australian Budget 2022-23

Figure 16 shows the relationship between Australia's merchandise trade and economic growth.

Export activity will continue to be driven by growth in major trading partners – China is Australia's largest trading partner and growth there is slowing as China transitions to consumer led growth from a model driven by infrastructure and capital investment in the last four decades. This will see a transition in demand for some of Australia's key exports.

Figure 16 Australia's merchandise export, import, GDP and the world economy

(Quarterly, index 2018-19=1, constant price)



Source: ABS; PwC; Outlook Economics

Broken down by trade routes, shipping activity is also heavily affected by factors specific to that particular trade route. While new markets can be found and new trade routes will open over time, in the short-term activity (and prices) will tend to reflect the demand and supply balances in the existing trade partners economies. Freight rates are highly competitive and supply capacity in the freight industry relative to the demand for freight will drive

freight rates, along with productivity changes over time. The most productive vessels can drive down prices over time leading to high barriers to entry for new players, literature supports the view that in general the largest ships tend to be the most productive, particularly for container/cargo ships.¹⁸

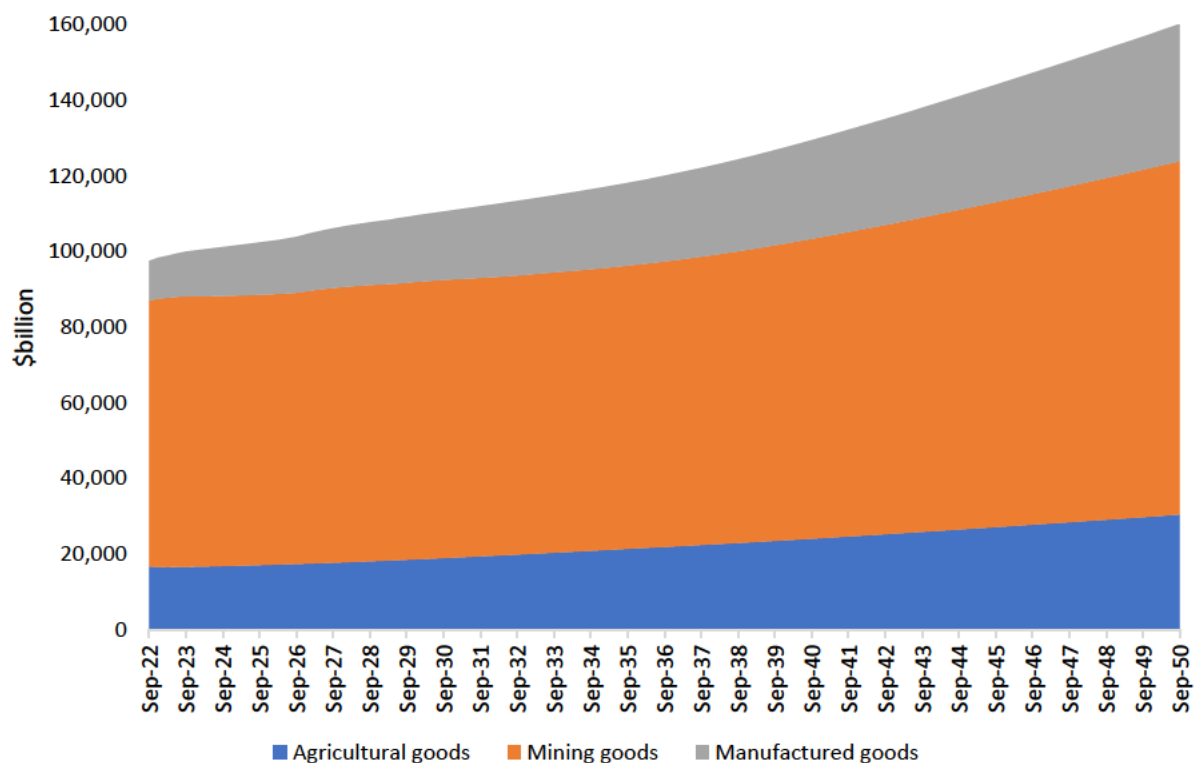
2.2.1 Exports

PwC projects agriculture exports to increase in value by 77 per cent by 2049-50 to \$120 billion (constant price); mining exports are projected to increase by 36 per cent by 2049-50 to \$370 billion (constant price); manufacturing exports are projected to increase by 258 per cent by 2049-50 to \$143 billion (constant price). It is worth noting that there are a range of forecasts and this only represents PwC's view.

This implies the relative demand for general cargo shipping and container carriers compared to other shipping types could be much larger, this is due to the high projected growth for manufacturing exports out to 2049-50 relative to the current state.

This is consistent with historical growth trends in terms of export volumes. Technology is also favouring strong potential for growth in this sector, as robotics, 3D printing and other technological advances reduces the value equation for low labour costs driving the location decisions of manufacturing production lines.

Figure 17 Merchandise export projection by component (quarterly), constant price



Source: PwC; Outlook Economics

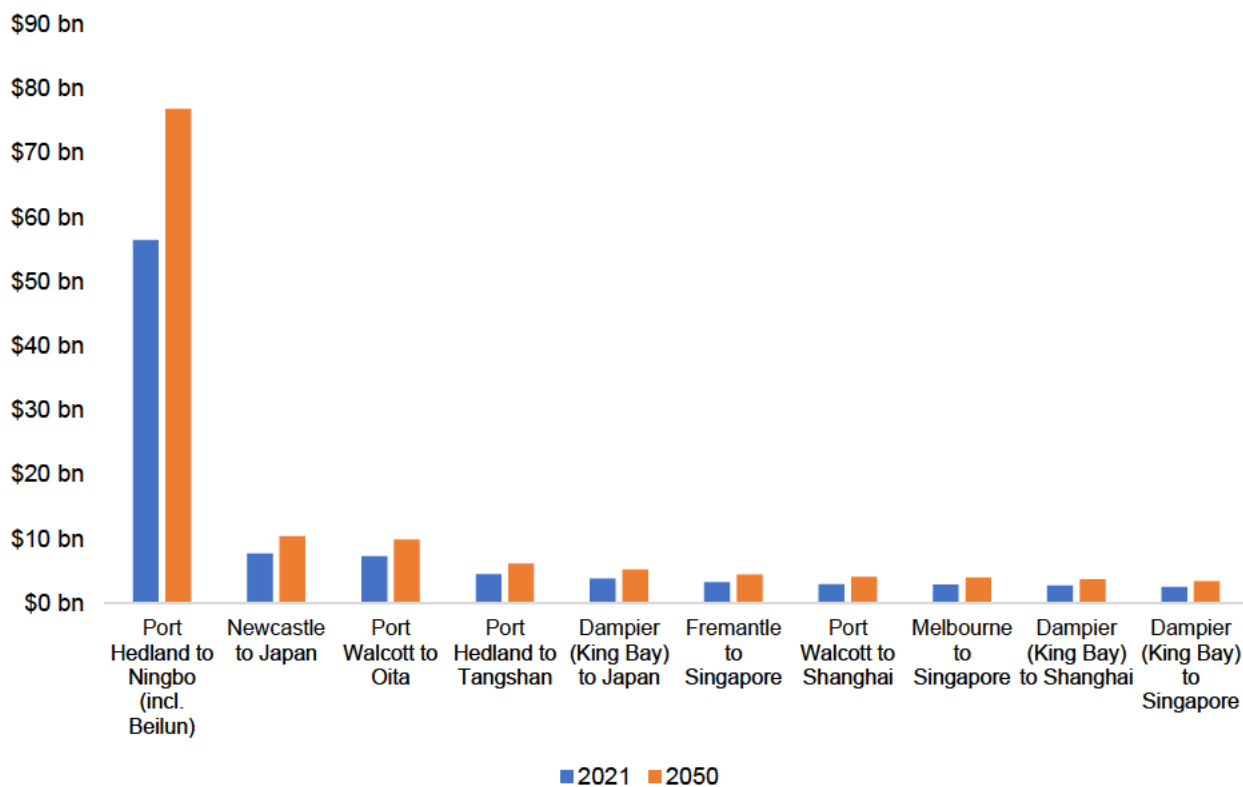
Top ten export trade routes

¹⁸ Transportation Research Part E: Logistics and Transportation Review

Volume 73, January 2015, Pages 1-16: *Productivity growth, scale economies, ship size economies and technical progress for the container shipping industry in Taiwan* – wei-Ming Wu, Jenn-rong Lin - The results show that scale economies and ship size economies play the dominant roles in improving total factor productivity (TFP) growth. Since 2006, the dominance of TFP growth has gradually shifted from scale economies to ship size economies. This finding reconfirms the cost advantage of large vessels.

By value

- PwC projects exports from Port Hedland to Ningbo in China to increase from \$56 billion in 2021 to \$77 billion (constant price) by 2050;
- Newcastle to Japan to increase from \$7.6 billion in 2021 to \$10 billion (constant price) by 2050;
- Port Walcott to Oita in Japan to increase from \$7.3 billion in 2021 to \$10 billion (constant price) by 2050;
- Port Hedland to Tangshan in China to increase from \$4.5 billion in 2021 to \$6 billion (constant price) by 2050;
- Dampier (King Bay) to Japan to increase from \$3.8 billion in 2021 to \$5.2 billion (constant price) by 2050;
- Fremantle to Singapore to increase from \$3.3 billion in 2021 to \$4.5 billion (constant price) by 2050;
- Port Walcott to Shanghai to increase from \$3 billion in 2021 to \$4 billion (constant price) by 2050;
- Melbourne to Singapore to increase from \$2.9 billion in 2021 to \$4 billion (constant price) by 2050;
- Dampier (King Bay) to Shanghai to increase from \$2.7 billion in 2021 to \$3.7 billion (constant price) by 2050;
- Dampier (King Bay) to Singapore to increase from \$2.5 billion in 2021 to \$3.4 billion (constant price) by 2050.

Figure 18 Projections of the top ten export trade routes **by value**: 2021-2050 (constant prices)

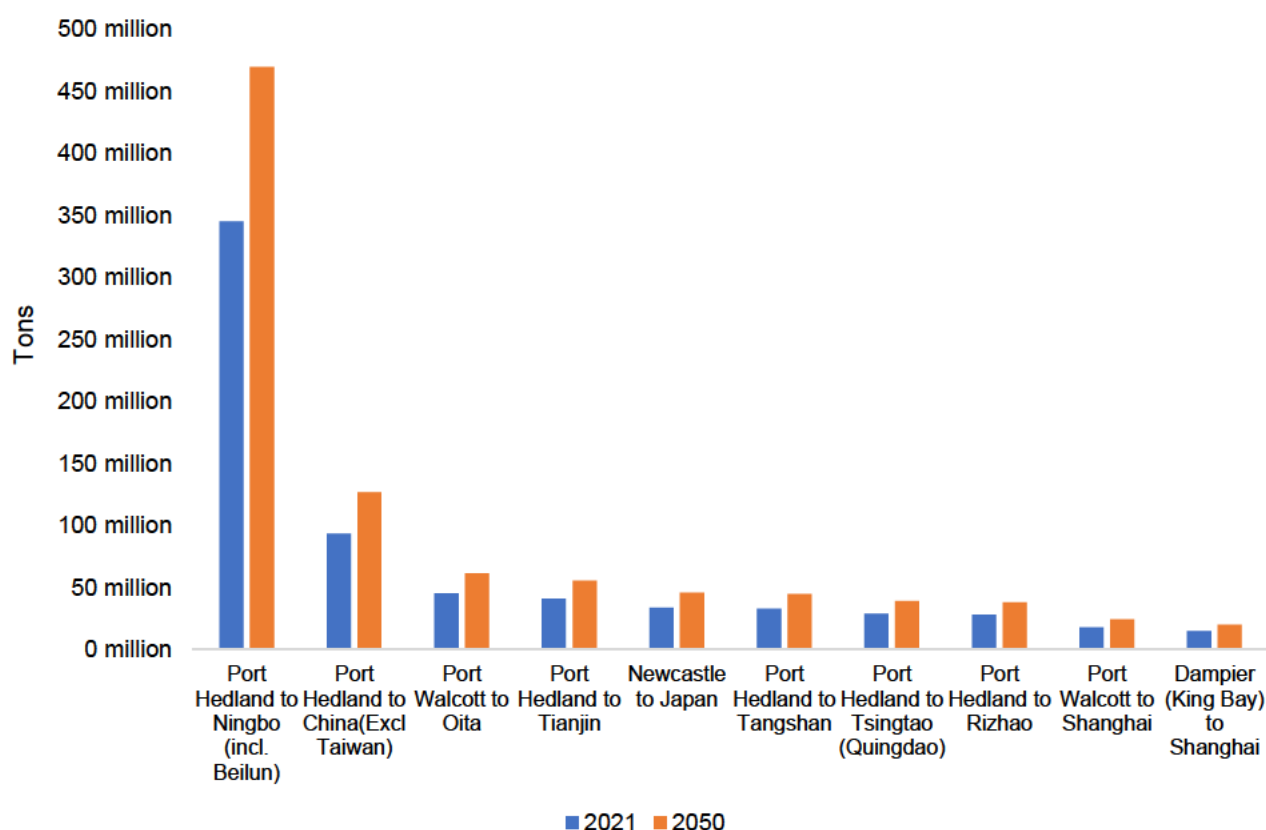
Source: PwC calculations; Outlook Economics

By weight

- PwC projects exports from Port Hedland to Ningbo in China to increase from 345 million tons in 2021 to 470 million tons by 2050;
- Port Hedland to China (unspecified ports, excl. Taiwan) to increase from 93 million tons in 2021 to 12 billion (constant price) by 2050;
- Port Walcott to Oita in Japan to increase from 45 million tons in 2021 to 61 million tons by 2050;
- Port Hedland to Tianjin in China to increase from 41 million tons in 2021 to 55 million tons by 2050;

- Newcastle to Japan to increase from 33.5 million tons in 2021 to 46 million tons by 2050;
- Port Hedland to Tangshan to increase from 33 million tons in 2021 to 44.5 million tons by 2050;
- Port Hedland to Tsingtao (Qingdao) to increase from 29 million tons in 2021 to 39 million tons by 2050;
- Port Hedland to Rizhao to increase from 28 million tons in 2021 to 38 million tons by 2050;
- Port Walcott to Shanghai to increase from 18 million tons in 2021 to 24 million tons by 2050; Dampier (King Bay) to Shanghai to increase from 15 million tons in 2021 to 20 million tons by 2050.

Figure 19 Projections of the top ten export trade routes **by weight**: 2021-2050



Source: PwC calculations; Outlook Economics

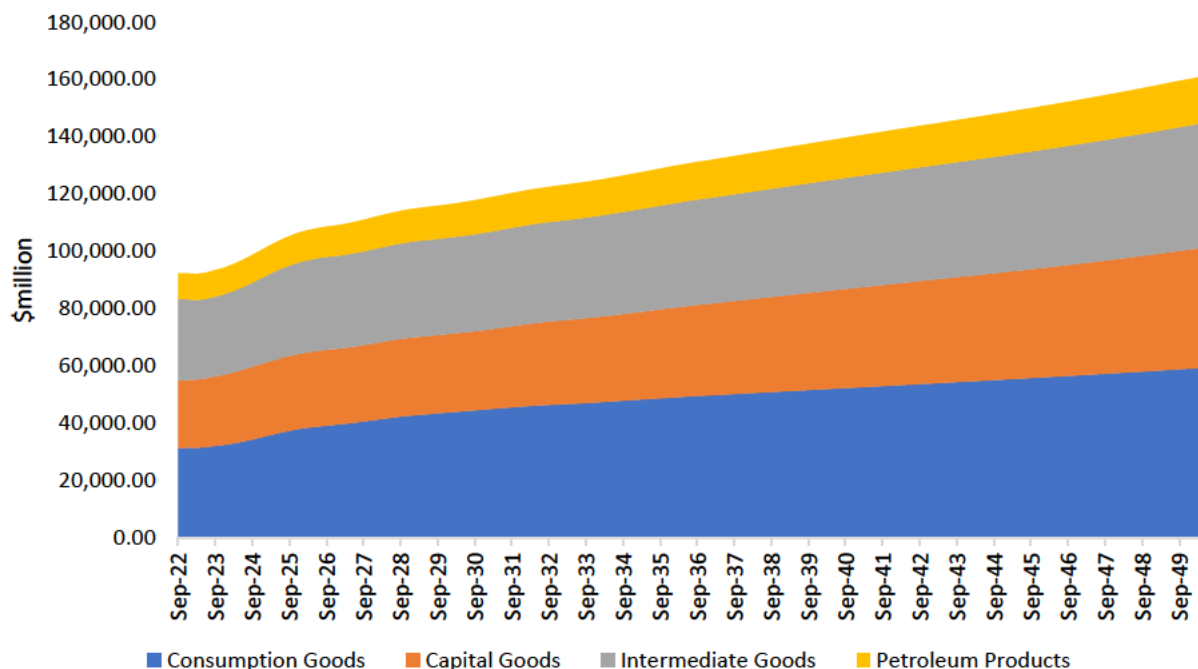
2.2.2 Imports

PwC have prepared projections for goods imports out to 2049-50 (see Figure 20). These projections are consistent with their historical trends, and broadly incorporate changes in population and economic activity and estimates of relative price changes over this period. Note further analysis may be required to consider upside and downside scenarios relative to the long-run trends reflected in these projections.

- PwC projects consumption goods imports will increase by around 100 per cent by 2049-50 to \$236 billion (constant price);
- capital goods imports are projected to increase by 82 per cent by 2049-50 to \$167 billion (constant price);
- intermediate goods imports are projected to increase by 51 per cent by 2049-50 to \$174 billion (constant price);

- petroleum products imports are projected to increase by 88 per cent by 2049-50 to \$65 billion (constant price), note there are specific risks related to net zero by 2050 and electric vehicle take up which could present downside risks to this projection.

Figure 20 Merchandise import projection by component (quarterly), constant price



Source: PwC; Outlook Economics

Top ten import trade route

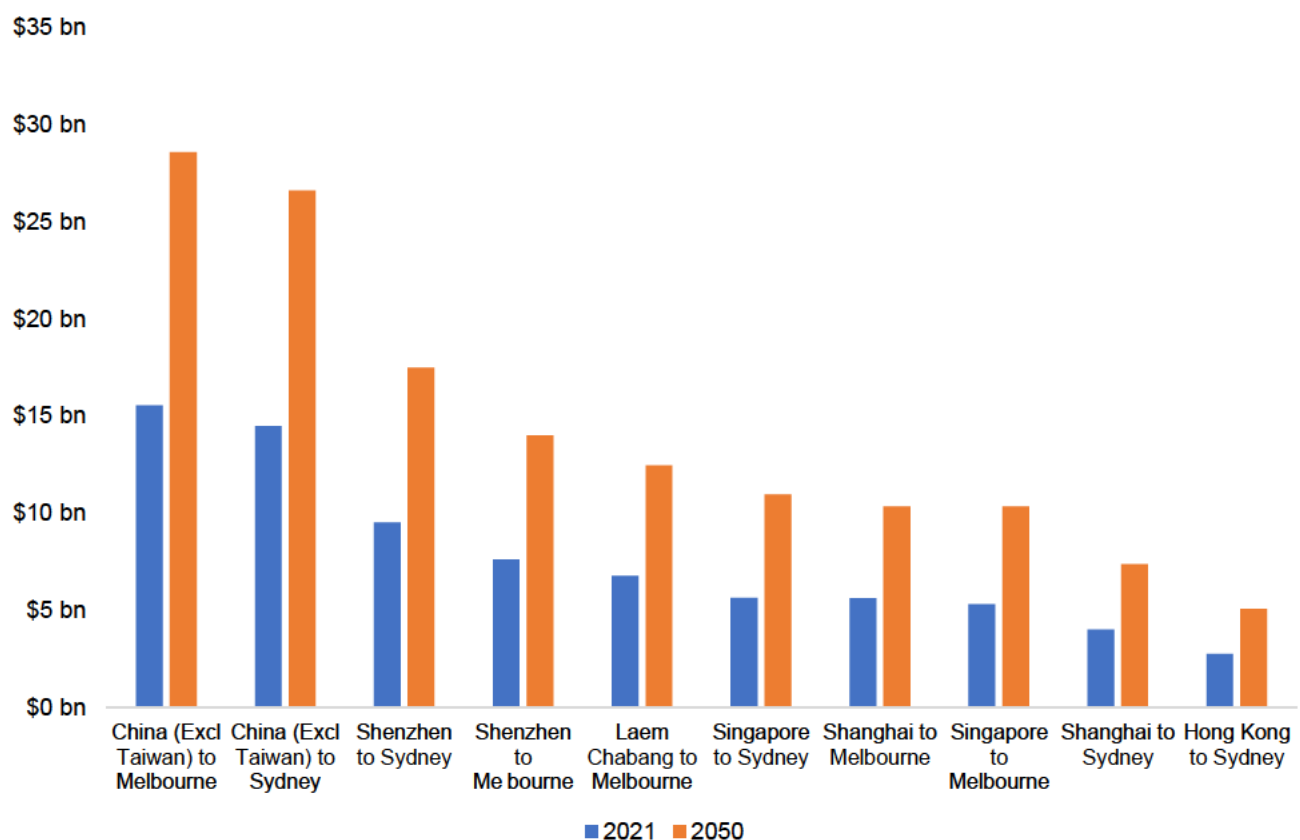
By value

Australia's top 10 import trade routes by value are outlined below, estimates of the distribution of growth have been translated into these trade routes holding trade shares broadly constant over time (see Figure 21).

- Imports from China (ex Taiwan) to Melbourne were \$15.5 billion in 2021 and are project to increase to \$28.5bn by 2050.
- Imports from China (ex Taiwan) to Sydney were \$14.5 billion in 2021 and are project to increase to \$26.6bn by 2050.
- Imports from Shenzhen to Sydney were \$9.5 billion in 2021 and are project to increase to 17.4 billion by 2050.
- Imports from Shenzhen to Melbourne were \$7.6 billion in 2021 and are project to increase to \$13.9 billion by 2050.
- Imports from Singapore to Sydney were estimated to be \$5.6 bn in 2021 and are project to increase to \$11 billion by 2050.
- Imports from Shanghai to Melbourne and were estimated to be \$5.6 bn in 2021 and are project to increase to \$10.3 billion by 2050.
- Imports from Singapore to Melbourne and were estimated to be \$5.3 bn in 2021 and are project to increase to \$10.3 billion by 2050.
- Imports from Shanghai to Sydney were estimated to be \$4 bn in 2021 and are project to increase to \$7.4 billion by 2050.

- Imports from Hongkong to Sydney were estimated to be \$2.8 bn in 2021 and are project to increase to \$5.1 billion by 2050.

Figure 21 Projections of the top ten import trade routes **by value**: 2021-2050 (constant prices)



Source: PwC calculations; Outlook Economics

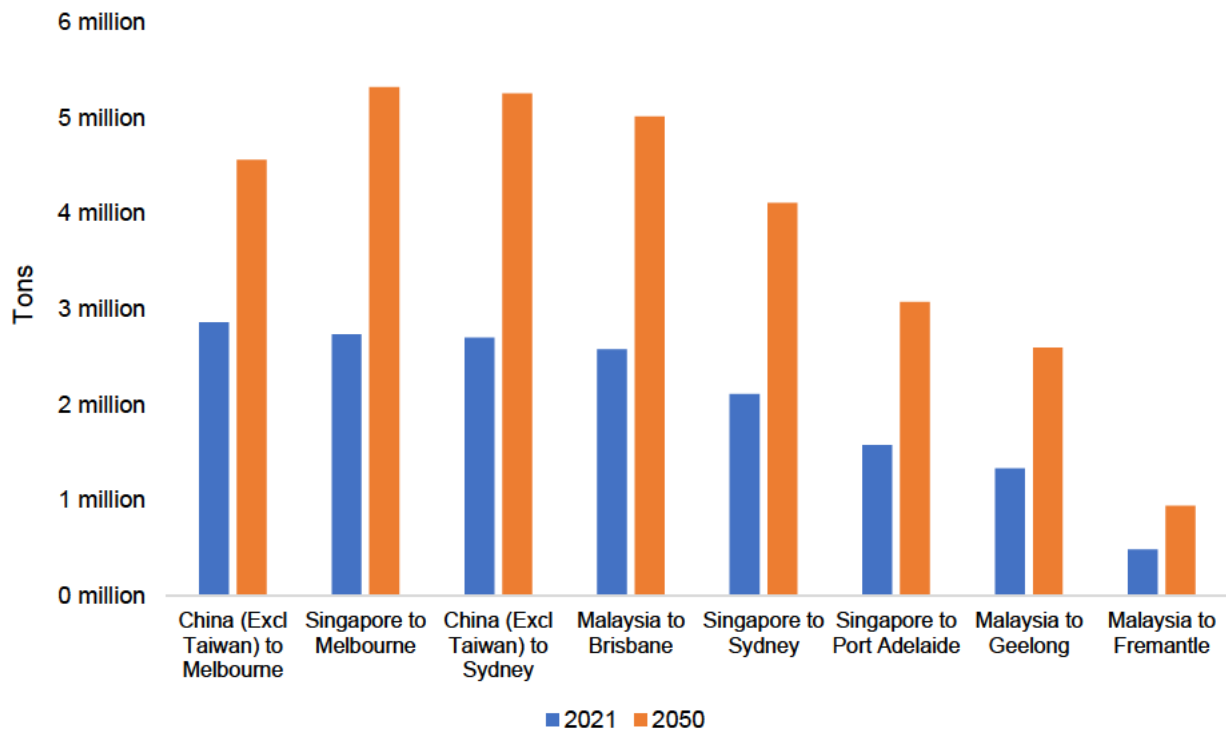
By weight

Australia's top import trade routes by volume (tonnes) are outlined below, estimates of the distribution of growth have been translated into these trade routes holding trade shares broadly constant over time (see Figure 22).

- Import volumes from China (ex Taiwan) to Melbourne were 2.8 million tonnes in 2021 and are project to increase to 4.6 million tonnes by 2050.
- Import volumes from Singapore to Melbourne were estimated to be 2.7 million tonnes in 2021 and are project to increase to 5.3 million tonnes by 2050.
- Import volumes from China (ex Taiwan) to Sydney were estimated to be 2.7 million tonnes in 2021 and are project to increase to 5.3 million tonnes by 2050.
- Import volumes from Malaysia to Brisbane were estimated to be 2.6 million tonnes in 2021 and are project to increase to 5.0 million tonnes by 2050.
- Import volumes from Singapore to Sydney were estimated to be 2.1 million tonnes in 2021 and are project to increase to 4.1 million tonnes by 2050.
- Import volumes from Singapore to Port Adelaide were estimated to be 1.6 million tonnes in 2021 and are project to increase to 3.1 million tonnes by 2050.
- Import volumes from Malaysia to Geelong were estimated to be 1.3 million tonnes in 2021 and are project to increase to 2.6 million tonnes by 2050.

- Import volumes from Malaysia to Fremantle were estimated to be 485 thousand tonnes in 2021 and are project to increase to 944 thousand tonnes by 2050.

Figure 22 Projections of the top import trade routes by weight: 2021-2050



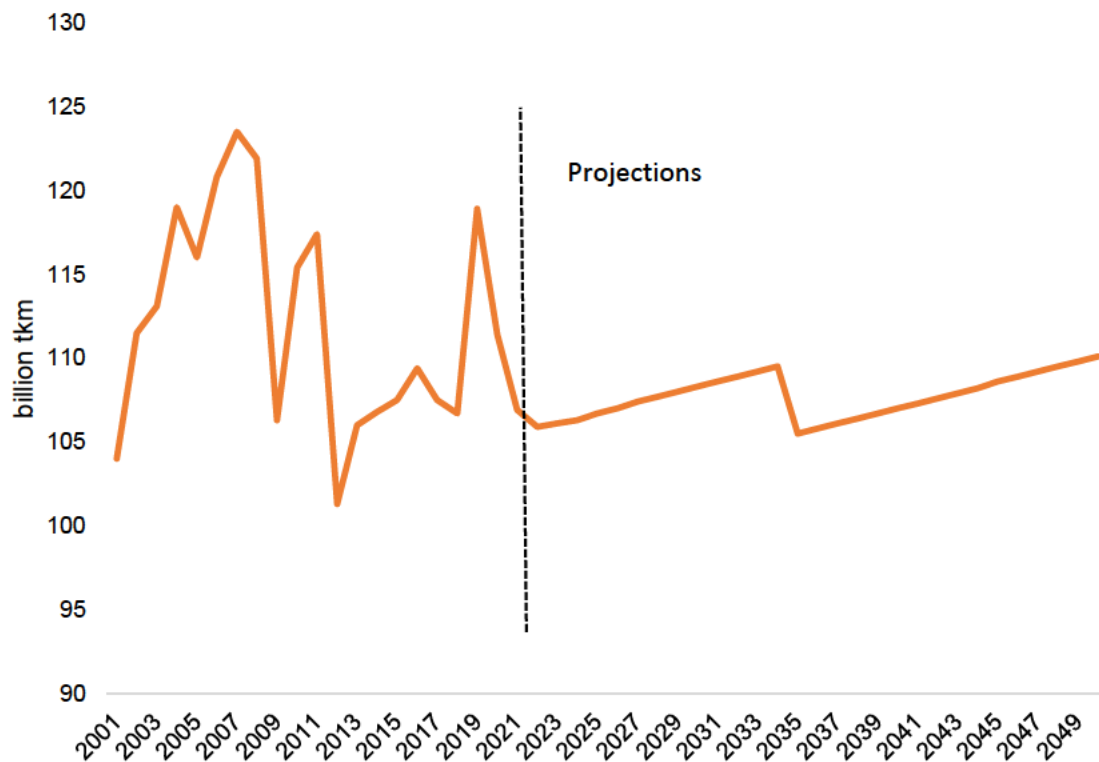
Source: PwC calculations; Outlook Economics; only 8 trade routes are projected as flow from New Caledonia to Townsville stopped in recent years and flow from Jebel Dhanna to Fremantle is too volatile to forecast.

2.2.3 Coastal trade

Coastal trade is projected to remain around its historical average at around 110 billion tkm out to 2050. There is no clear upward or downward trends observable in coastal trade volumes in the past two decades – volatility can reflect changes in freight mode for specific components of coastal trade (i.e., development of new mines or bulk commodity facilities using coastal shipping).

Even over the past five decades, total coastal freight volumes have grown only modestly, increasing from around 72 billion tonne kilometres in 1970–71 to around 110 billion tonne kilometres in 2019–20 – an average annual growth rate of 0.95 per cent per annum over that period – below population growth. In terms of upside and downside risks scenario analysis for coastal trade would need to consider climate risks and Australia's net zero by 2050 target. Developments in this space may see demand for coastal shipping increase (as shipping is a low CO₂ emission option) as companies increasingly report energy intensity in modes of transport and as tertiary CO₂ emissions are increasingly reported in the information that companies release to markets.

Figure 23 Projection of coastal trade volume to 2050



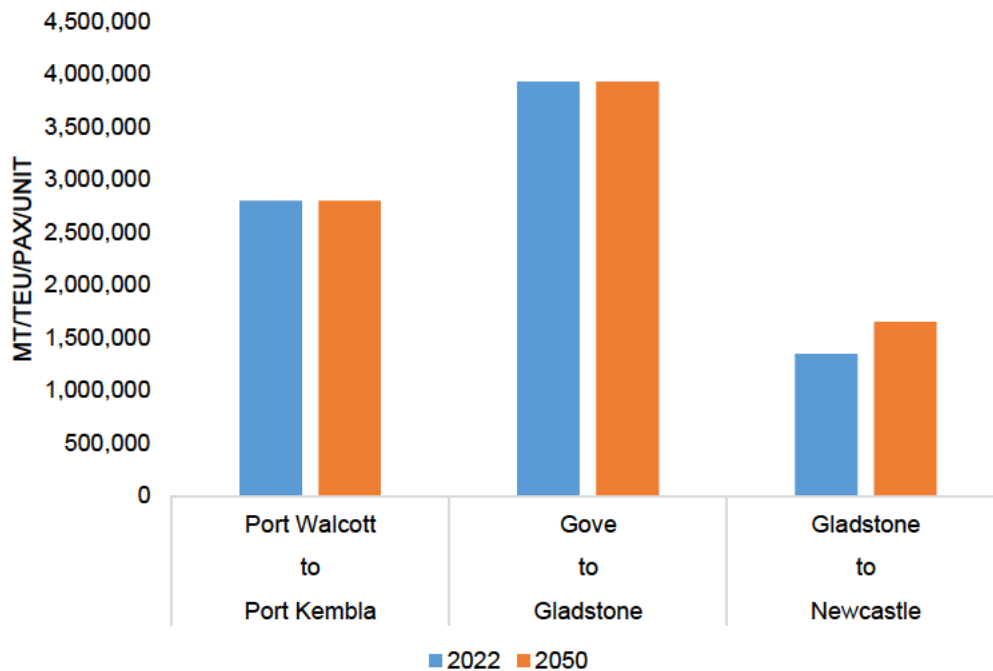
Source: Bureau of Infrastructure and Transport Research Economics (BITRE)

Port Walcott to Port Kembla trade route (dominated by iron ore) is projected to remain flat by 2050, based on the assumption that BlueScope Steel and Liberty OneSteel continue to produce steel for the domestic market and that any significant increase in Australian steel demand is met through imports (see Figure 24).

Gove to Gladstone trade route (dominated by bauxite) is also projected to remain flat by 2050, based on the assumption that domestic bauxite output, alumina refining and aluminium production remains around Office of the Chief Economist (OCE), Department of Industry, Science and Resource's forecast 2026–27 levels (produced in 2022) out to 2050, with domestic coastal shipping volumes to remain around current levels out to 2050.

Gladstone to Newcastle (historically 83 per cent alumina, 17 per cent cement and magnetite) is projected to grow moderately by 6 per cent by 2050, based on the assumption that alumina shipping will remain flat while other dry bulk shipping grows by 35 per cent by 2050. The growth size of 35 per cent by 2050 is consistent with the historical trend of other dry bulk coastal shipping.

Figure 24 Projections of the current top three coastal trade routes under temporary licences by volume to 2050



Source: PwC calculation based on BITRE projection

There could be opportunities for coastal shipping as new industries emerge and as old industries decarbonise and electrify which significantly impacts the global competitive position, making the future coastal trade flow deviate from the projection above.

For example, Australia's renewable resources could make itself a lower-cost place to make hydrogen and then green steel production that is powered by hydrogen. This could create green steel manufacturing centres in central Queensland and the Hunter Valley in NSW, where there is a large and affordable industrial workforce compared with WA. This could then create significant coastal trading demand from Pilbara in WA to Queensland and NSW.¹⁹

It should be noted that through the \$15 billion National Reconstruction Fund, the Federal Government is supporting expansion of Australia's local production capability for renewable and clean energy; critical minerals and associated production; and expansion other segments of the manufacturing industry (i.e., transport, defence), which may increase demand for, and movement of key commodities and other freight.

¹⁹ Grattan Institute, Start with steel, <https://grattan.edu.au/wp-content/uploads/2020/05/2020-06-Start-with-steel.pdf>

3. The shipping reform in 2012 and comparison of international fleet changes against Australian fleets since then

3.1 The Coastal Trading (Revitalising Australian Shipping) Act 2012 reformed Australian shipping

A small but critical component of Australia's domestic freight task around 15 percent in 2019 is carried by coastal shipping.²⁰

The 2012 reforms intended to remove barriers to investment in Australian shipping, fostering global competitiveness and secure a stable maritime skills base for Australian industry. The shipping reform package adopted a two-pronged approach:

- tighter regulation of coastal trading operations through a new licencing regime, along with the introduction of a civil penalty regime and an increase in existing penalties;
- taxation incentives available to vessels registered in Australia where the registrant meets certain specified criteria.

The 2012 reforms created standalone legislation that requires ships trading on the Australian coast to be appropriately licensed. The Act regulates coastal trade by granting licences to authorise vessels to carry passengers or cargo between ports in Australia. Under the legislation three types of licence are issued:

- a General Licence, which are granted to an organisation to authorise an Australian vessel registered on the Australian General Shipping Register to conduct coastal trading. A General Licence enables vessels to have unrestricted access to the Australian coast and lasts for a period of no longer than five years (but may be renewed).
- a Temporary Licence which are granted to a company (not a specific vessel) and authorises the company to use a foreign vessel/s to move cargo for a period of 12 months. Temporary Licences are valid for 12 months; and
- an Emergency Licence which grants access to engage in coastal trading in specified emergency situations for a period of no more than 30 days.

The reform package also required licensees to comply with the Australian Fair Work Act 2009, which was implemented through the Fair Work Regulations 2010.²¹ This means foreign crews are entitled to be paid Australian wages while operating coastal shipping operations in the Australian domestic economy.

As part of the legislative reform package tax incentives were also provided. The tax incentive package consists of:

Shipping Exempt Income tax incentive

Income from "core shipping activities" and its "incidental shipping activities" relating to vessels is exempt from Australian income tax during days that the taxpayer holds an exemption certificate.

Core shipping activities are "activities directly involved in operating a vessel to carry shipping cargo or shipping passengers for consideration", including crewing the vessel, providing containers that carry cargo, loading and unloading cargo from the vessel and activities generating onboard income from passengers.

²⁰ BITRE, Australian Infrastructure Statistics – Yearbook 2018 (2018), 67.

²¹ Application of the Fair Work Act to truckload (TL) ships on their 3rd voyage was not part of the 2012 shipping reform package as characterised. It was implemented several years earlier.

Incidental shipping activities are defined simply as activities incidental to core shipping activities. Total incidental shipping income may not exceed 0.25 per cent total core shipping income in any accounting period.

Accelerated depreciation and rollover relief

The new concession introduces a statutory cap of 10 years on the effective life of a vessel covered by a depreciation certificate. It will still be open to taxpayers to make their own determination of effective life (whether more or less than 10 years).

A taxpayer and its associates cannot claim both accelerated depreciation and the income tax exemption in relation to the same vessel in the same year.

The balancing adjustment arising from the disposal of a vessel covered by a depreciation certificate will be deferred to the second income year after the year of the disposal. Additionally, a new roll-over relief may be available to remove all or part of any positive balancing charge.

Seafarer Tax Offset

An employer of Australian seafarers is to be entitled to a refundable tax offset equal to 30 per cent of salary, wages and allowances paid to those seafarers in respect of which the employer has paid withholding tax under the PAYG system, when certain requirements are met.

Exemption from royalty withholding tax

Under Australian domestic law, charter hire paid to a non-resident owner or lessor may be subject to Australian royalty withholding tax at the rate of 30 per cent. The new exemption from royalty withholding tax will apply where the lessee is an Australian resident company and certain requirements are met.

3.2 High take-up of the tax incentives

In 2020-21, eight entities made 26 applications for a certificate, and one entity made one application for a notice as per the 2020–2021 Regulator Self-Assessment—Shipping Reform (Tax Incentives) Act 2012. This implies a high take-up rate of the tax incentive initiative, particularly considering there was only 21 Australian registered major trading fleet entities in 2018-19. The data in figure 25 and 26 shows the reforms might have begun to achieve their strategic objectives of retaining capability in coastal shipping in particular, and halting the strong downward trend in Australian flagged vessels. It is worth noting that the appeared structural break in the trend of Australian fleets in 2012 could also be a coincidence with the shipping reform.

3.3 Comparing international fleet changes against Australian fleets

Following the introduction of the 2012 reforms the downward trend in Australian registered vessels has plateaued at around 4 ships trading internationally. The reforms have also coincided with an acceleration in the number of international registered ships trading in Australian waters (see Figure 25).

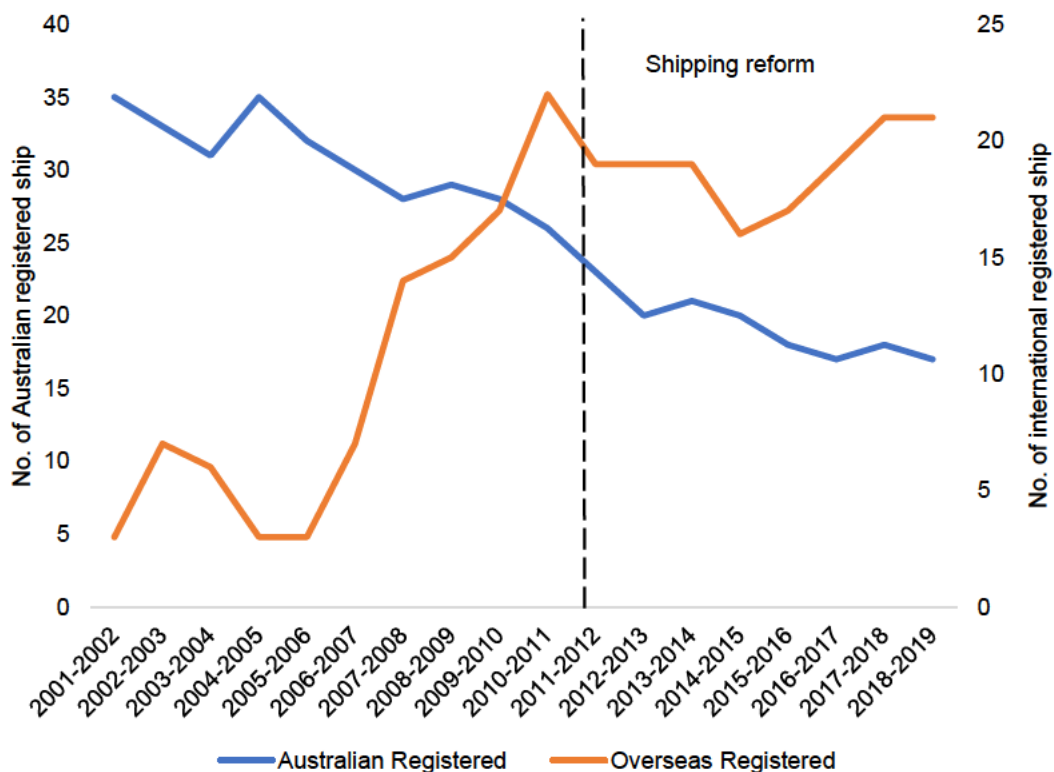
Figure 25 International trade: international fleets vs Australian fleets



Source: Australian sea freight 2018–19

The trend decline in Australian registered coastal trading ships has eased with a decline of three registered ships since 2019, as opposed to a decline of 12 ships in the 7 years preceding the 2012 reforms (see Figure 26). The strong increase in overseas registered ships servicing Australian coastal trade markets between 2001 and 2012 has plateaued. The number of coastal trading ships that are internationally registered was around 21 in 2019.

Figure 26 Coastal trade: international fleets vs Australian fleets



Source: Australian sea freight 2018–19

External views on how the reforms are operating in practice:

Ports Australia²²:

‘Application timeframes, cost, documentation and reporting requirements and ongoing uncertainties [relating to administrative timeframes and outcomes], reduce the competitiveness of shipping and supply of shipping capacity as compared with other transport modes. Intrastate trading differs slightly, requiring a Section 12 declaration which has no application cost nor approval timeframe.’

The Australian Dry Bulk Shipping Users²³:

‘Changed licensing arrangements proposed under the Australian Government’s shipping reform package, *Stronger Shipping for a Stronger Economy*, will lead to an increase in the cost of coastal shipping and, by extension, freight rates of up to 16%.’

The 2012 reforms have coincided with a slowdown in the loss of capacity in Australian flagged vessels supplying capacity in the coastal trade. The reforms have also coincided with a plateau in the number of Australian flagged ships supplying capacity into international trade routes.

4. Types and number of vessels currently and projected to be in the Australian major trading fleet to 2050

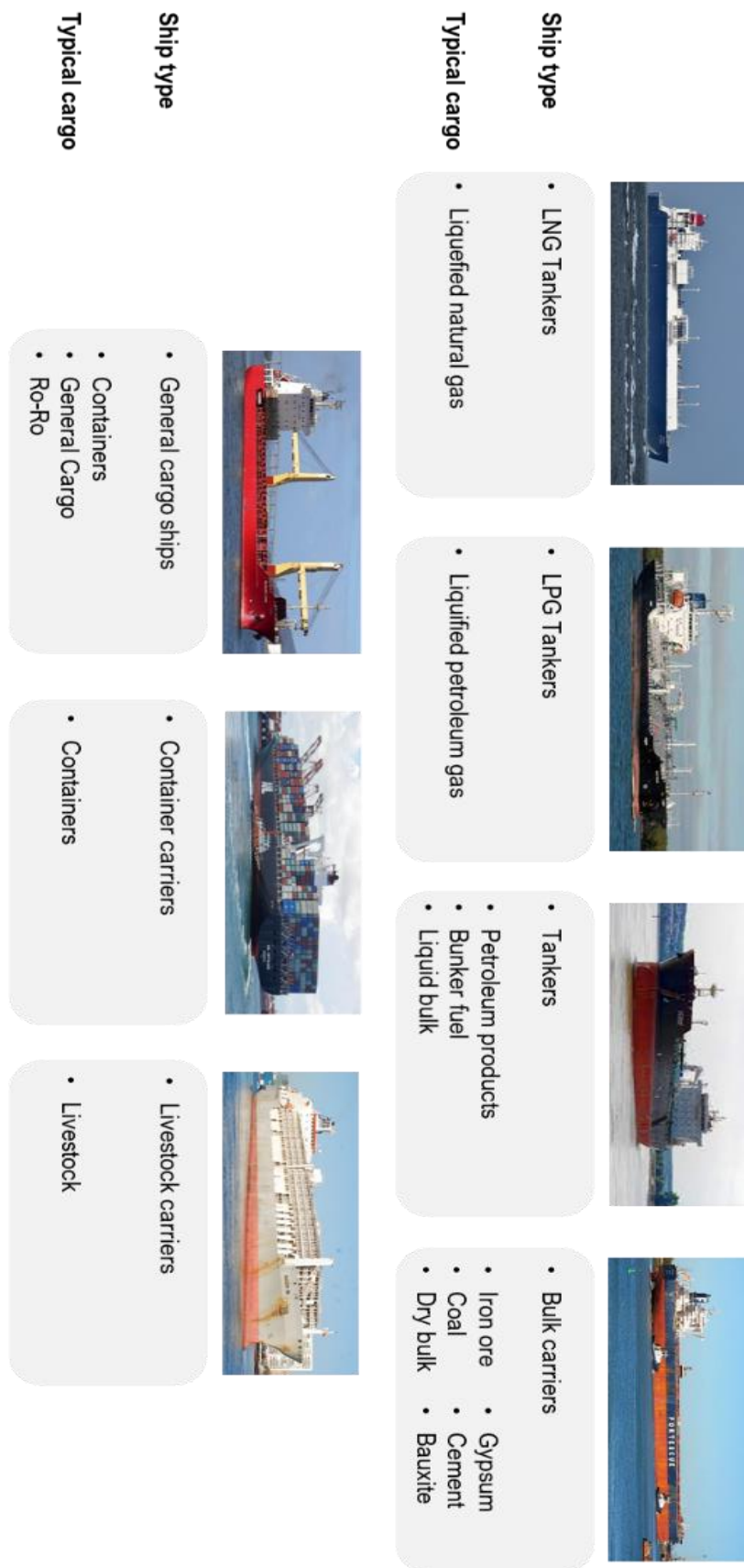
There are seven ship types in the Australian major trading fleet (including foreign-flagged vessels) in 2018-19: LNG (liquefied natural gas) tankers, LPG (liquefied petroleum gas) tankers, Tankers (in coastal trade only), bulk carriers, general cargo ships, container carriers and livestock carriers. Figure 27 shows the typical cargo carried by each ship type.²⁴

²² Ports Australia - Coastal Shipping Fact Sheet -18 Nov 2022 - https://uploads-ssl.webflow.com/5b503e0a8411dabd7a173eb7/60934f678088e29eeb26074a_Ports%20Australia%20Coastal%20Shipping%20Factsheet.pdf

²³ Advisory report on Bills referred 22 March 2012, House of Representatives Standing Committee on Infrastructure and Communications, https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=ic/shipping/report/fullreport.pdf

²⁴ Australian major trading fleet is defined as fleet owned or operated by Australian companies as at the end of the financial year as recorded by Lloyd’s List Intelligence (with corrections made as necessary) that are active in Australia during the financial year.

Figure 27 Common commodities by ship type in Australia

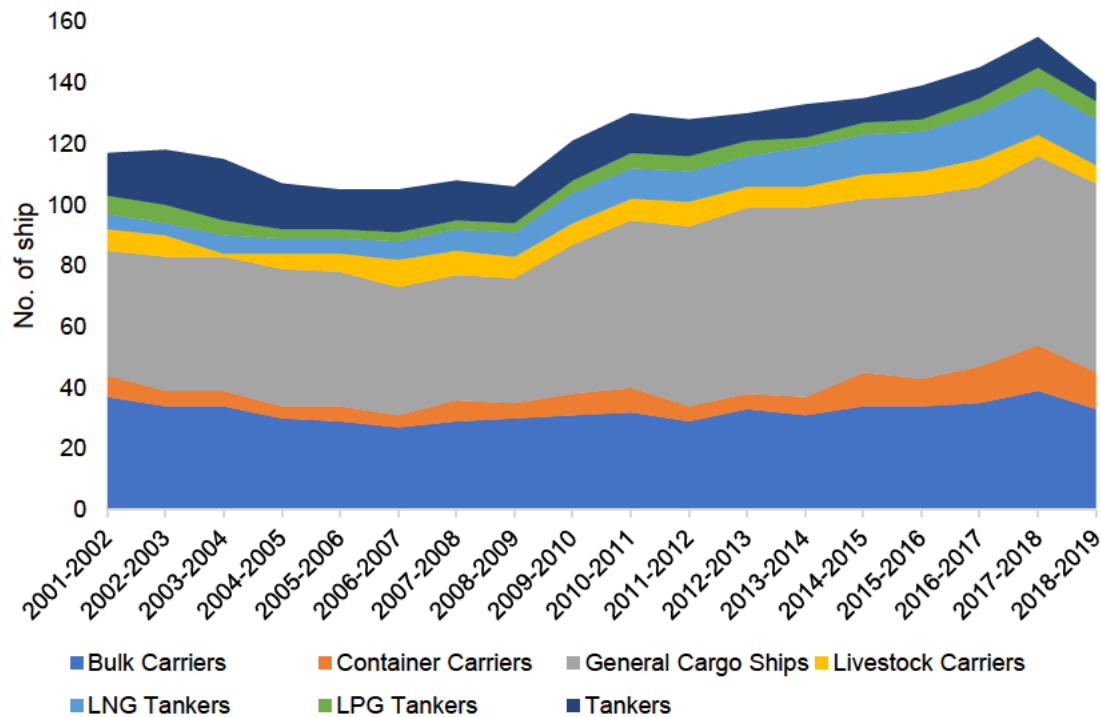


Source: Australian sea freight 2018–19

Current state

In the past two decades, the Australian major trading fleet (including foreign-flagged vessels) has increased by 20 per cent measured by ship number. However, the changes vary significantly across ship type: LNG tankers (200 per cent increase), container carriers (71 per cent increase), general cargo ships (51 per cent increase) are the three ship types that record significant growth; LPG tankers remains flat; bulk carriers (11 per cent decrease), livestock carriers (14 per cent decrease) and tankers (coastal trade only, 57 per cent decrease) are the three ship types that record significant decline (Figure 28).

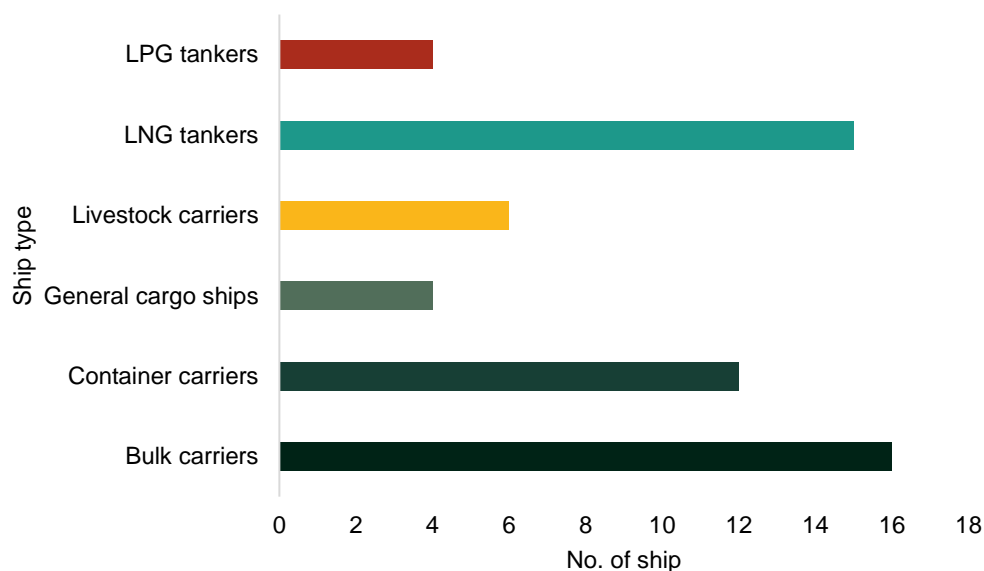
Figure 28 Australian major trading fleet (including foreign-flagged vessels) by ship type



Source: Australian sea freight 2018–19 and 2011-12

In 2018-19, the Australian major international trading fleet (including foreign-flagged vessels) has 16 bulk carriers, 12 container carriers, 4 general cargo ships, 6 livestock carriers, 15 LNG tankers and 4 LPG tankers (Figure 29).

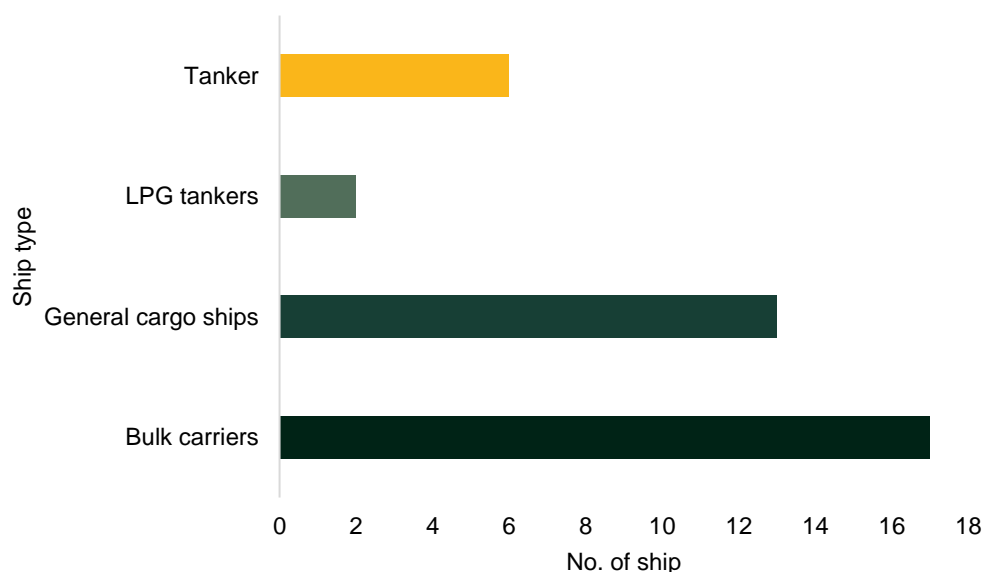
Figure 29 **International trade:** Australian major trading fleet (including foreign-flagged vessels) by ship type in 2018-2019



Source: Australian sea freight 2018–19

In 2018-19, the Australian major coastal trading fleet (including foreign-flagged vessels) has 17 bulk carriers, 13 general cargo ships, 6 livestock carriers, 2 LPG tankers and 6 tankers (Figure 30).

Figure 30 **Coastal trade**: Australian trading fleet (including foreign-flagged vessels) by ship type in 2018-2019



Source: Australian sea freight 2018–19

4. 1 Projections

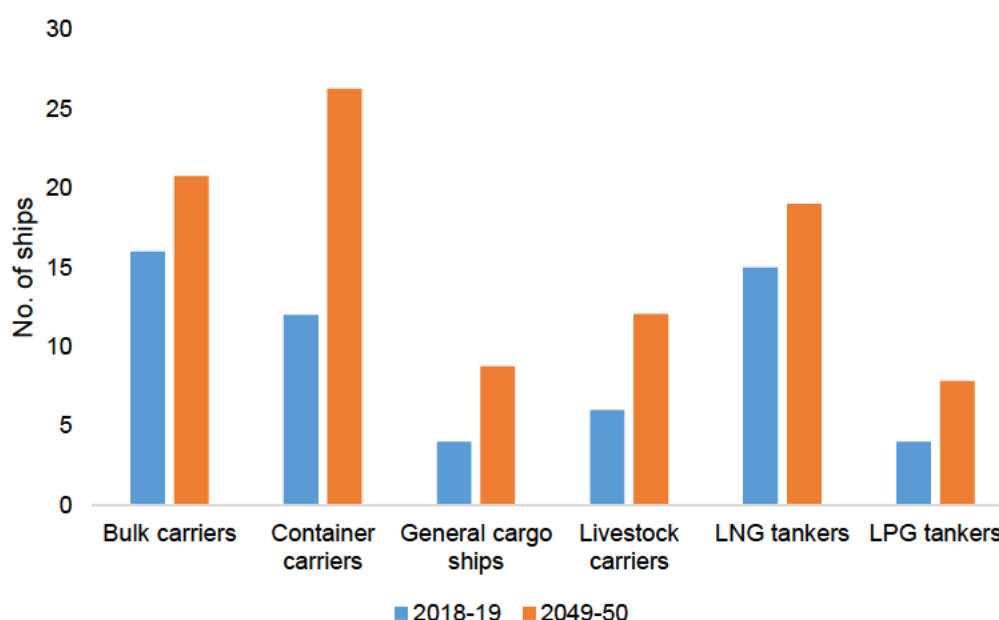
PwC produces the projections for Australian major international fleet and coastal fleet separately. The international fleet by type is projected based on the growth in import and export for the corresponding cargo type while the domestic fleet by type is based on the growth in coastal trading for the corresponding cargo type. It is worth noting that the projections could be significantly impacted by the trend of worldwide decarbonisation and emerging new industries. For example, under the net-zero commitments, demand for thermal coal and fossil

fuels could be reduced more than expected as electrified transport continues to expand, leading to demand for bulk carriers and LNG/LPG tankers lower than projected; on the other hand, the rise of hydrogen or carbon storage could lead to demand for tankers higher than projected.

4.2.1 International trade

PwC has forecast the number of bulk carriers to increase by 30 per cent (or 5) by 2050, consistent with its projection on mining exports; the number of container carriers to increase by 120 per cent (or 14) by 2050, consistent with PwC's projection on manufacturing export and general imports; the number of general cargo ships to increase by 120 per cent (or 9) by 2050. This is consistent with PwC's projection on manufacturing export and general imports; the number of livestock carriers to increase by 100 per cent (or 6) by 2050, consistent with PwC's projection on agriculture export; the number of LNG tankers to increase by 30 per cent (or 4) by 2050, consistent with PwC's projection on mining exports; the number of LPG tankers to increase by 91 per cent (or 4) by 2050, also consistent with PwC's projection on petroleum imports.

Figure 31 **International trade**: Australian fleets in 2018-19 and 2049-50

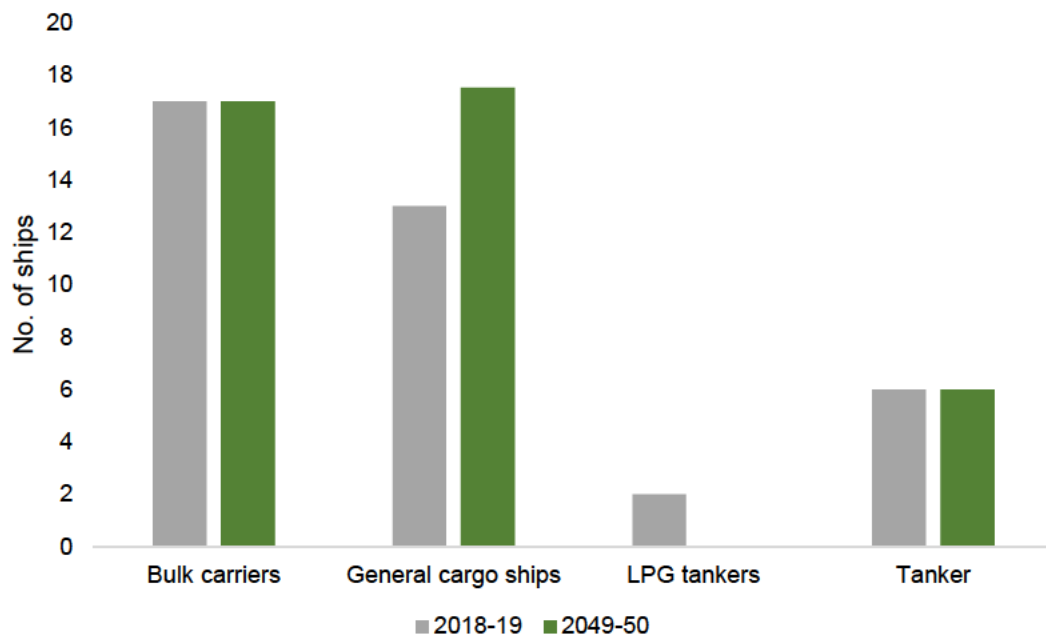


Source: PwC projections

4.2.2 Coastal trade

PwC forecasts the number of bulk carriers to remain flat by 2050, consistent with BITRE's projection on iron ore coastal shipping; the number of general cargo ships to increase by 35 per cent (or 5) by 2050, consistent with BITRE's projection on shipping of other dry bulk; the number of LPG tankers to decrease by 100 per cent (or 2) by 2050, consistent with BITRE's projection on shipping of crude oil and petroleum products; the number of tankers to remain flat by 2050, consistent with BITRE's projection on shipping of Other liquid bulk.

Figure 32 **Coastal trade**: Australian fleets in 2018-19 and 2049-50



Source: PwC projections

Box 1 High growth scenario

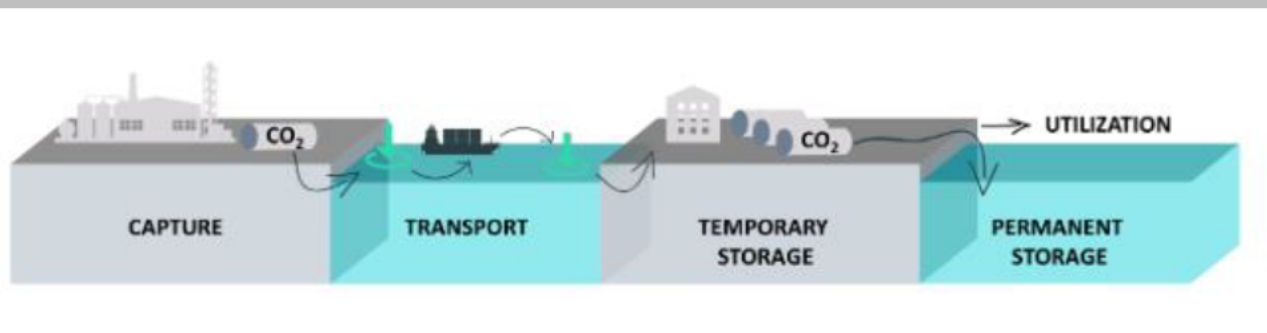
The baseline projections assume there is no significant structural change that could lead to the explosive growth in demand for sea freight transportation.

However, explosive growth in demand could happen when there are revolutionary industries that grow very quickly. For example, due to climate change and technological breakthroughs, the costs of carbon storage could decrease significantly, leading to high demand for carbon transportation.

Globally, CO₂ shipping is growing to accommodate offshore geological storage. For decades commercial CO₂ shipping has served markets seeking food grade, or high-purity CO₂ for utilisation purposes. Although technical challenges remain in CO₂ shipping the technologies for transport are increasingly maturing, making the business case more favourable for widespread adoption.

How does carbon shipping work?

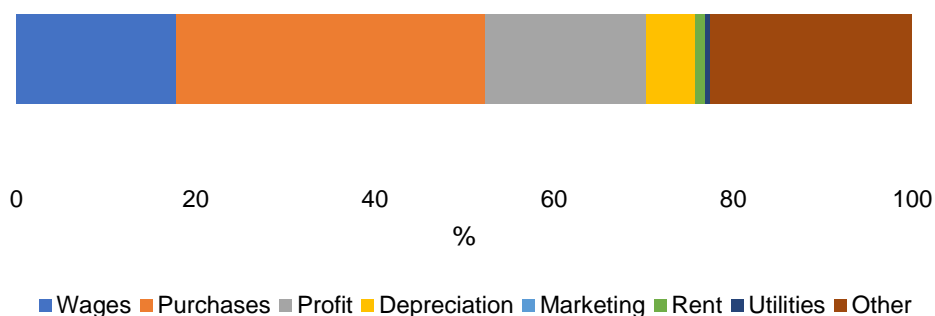
CO₂ transportation by ship requires a pressure system to maintain the CO₂ in a liquid state. CO₂ tankers generally operate at conditions near the triple point – the temperature and pressure where CO₂ can coexist in thermodynamic equilibrium, or where the solid, liquid and gas states converge - but new research suggests that CO₂ can be shipped at varying pressure and temperature conditions to help integrate shipped CO₂ into the existing carbon capture and storage value chain (see the picture below).



5. Operating cost differences between Australian and foreign flagged vessels

The key cost components of the Australian shipping industry include wages (18 per cent), purchase (terminal costs, container transport and fuel, 34.5 per cent), profit (18 per cent), depreciation (5.5 per cent), rent (1 per cent), utilities (0.6 per cent) and other costs (pilotage, navigation services, levies, conservancy fees paid to marine regulations and other compliance costs, 22.5 per cent).

Figure 33 Cost structure of Australian shipping industry in 2022



Source: IBISWorld

The key differences between the Australian and foreign flagged vessels are the wage rates. Australian flagged vessels are subject to the Seagoing Industry Award 2020, which specifies the minimum entitlements of the employees of the seagoing industry in Australia.

Table 1 is the wage structure based on the minimum rates from the Award, noting the minimum wages vary across vessels - the larger and more complicated a vessel, the higher the minimum wages.

Table 1 Classifications and minimum rates

Classification	Minimum weekly rate (full-time employee)
	\$
Master	1469.20
Chief engineer	1445.00
First mate/First engineer	1252.80
Second mate/Second engineer/Radio Officer/Electrical Engineer	1159.60
Third mate/Third engineer	1111.40
Chief integrated rating/Bosun/Chief cook/Chief steward/Carpenter/Fitter/Repairer/Donkeyman/Electrician	1051.60
Integrated rating/Able seaman/Fireman/Motorman/Pumpman/Oiler greaser/Steward	958.30
OS/Wiper/Deckboy/Catering Boy/2nd Cook/Messroom Steward	812.70

Source: Seagoing Industry Award 2020

The monthly minimum basic wage from the ITF Uniform Total Crew Cost (TCC) Collective Bargaining Agreement (CBA) for Crews on Flag of Convenience Ships for an able seafarer is US\$860 (excluding overtime and leave) as of 1 January 2022. This equates A\$15,403 a year based on an exchange rate of 0.67 US\$/A\$, or 31 per cent of the minimum wages of an able seaman (\$49,832 as of July 2022) across all trading vessel types

in the Seagoing Industry Award 2020. This implies the costs of Australian registered vessels could be 58 per cent higher than the international counterparts assuming wages accounts for 18 per cent of the cost structure.²⁵

6. The future of Australian Shipping industry

In the near-term, a focus on general cargo ships and container carriers could generate near- commercial results for Australian registered vessels. This is supported by the projected strong growth in these two ship types in both international trade and coastal trade and the facts that most imports are shipped by these two ship types. The composition of the recent Australian Flagged Major Vessels in coastal trade also supports this: 10 out of 16 ships are cargo/container ships (Table 2).

Table 2 Coastal trade: Australian Flagged Major Vessels in 2020-21

	Vessel name	Vessel type	Vessel capacity (DWT)
1	Goliath#	Bulk carriers (self-discharging)	15.5
2	Wunma	Bulk carriers (self-discharging)	5.1
3	Aburri	Bulk carriers (self-discharging)	3.3
4	Donnacona#	Bulk carriers (self-discharging)	28.1
5	Liekut#	General cargo ships	11.9
6	Tasmanian Achiever II#	General cargo ships	11.5
7	Victorian Reliance II#	General cargo ships	11.5
8	Accolade II#	General cargo ships	8.1
9	Searoad Mersey II#	General cargo ships	8.0
10	Spirit of Tasmania I#	General cargo ships	5.1
11	Spirit of Tasmania II#	General cargo ships	5.1
12	Lucky Eyre	General cargo ships	3.4
13	Trinity Bay#	General cargo ships	3.2
14	John Duigan#	General cargo ships	2.4
15	Absolute I	Tankers	8.6
16	Larcom	Tankers	4.0

Source: BITRE; # denotes major Australian registered vessels with a general trading licence.

In the medium to long term, there could be opportunities that level the playing field for Australian flagged vessels, mostly in the form of reduced requirement for labour. For example, the four Australian flagged bulk carriers in coastal trade are all self-discharging. Digitally enabled technologies and advances in automation could significantly reduce the share of crew in the cost structure of shipping such as in the form of automated ships.

²⁵ This is calculated based on Australia's minimum wage for an able seafarer is 2.2 times (1/0.31-1) higher than an international able seafarer. Assuming all other costs are the same except wages between Australian-flagged and foreign-flagged vessels, the higher overall costs is calculated as follows: 220 per cent * 18 per cent (share of wages in overall costs) = 58 per cent.

Size of ships also matters. Scale economies can significantly bring down the crew cost disadvantages of Australian registered vessels. Literature supports the argument that 'scale economies and ship size economies play the dominant roles in improving total factor productivity (TFP) growth. Since 2006, the dominance of TFP growth has gradually shifted from scale economies to ship size economies. This finding reconfirms the cost advantage of large vessels.²⁶ However, this would require identifying stable trade routes that have large trade flow, which is possible as Australia's population and economy continues to grow. Investment in larger port infrastructure is also required to accommodate the larger vessels.

Box 2 Automated cargo ships

Autonomous cargo ships, also known as autonomous container ships or maritime autonomous surface ships (MASS), are crewless vessels that transport either containers or bulk cargo over navigable waters with little or no human interaction.

The Maritime Safety Committee at the International Maritime Organization (IMO) has proposed a preliminary definition of autonomous ships as Maritime Autonomous Surface Ships (MASS) which includes the degrees of autonomy a ship can operate independently of human interaction:

- Degree one: Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control.
- Degree two: Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.
- Degree three: Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.
- Degree four: Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

Yara International's autonomous electric containership Yara Birkeland, world's first fully electric and completely autonomous cargo ship, has successfully completed its first voyage in 2022. MV Yara Birkeland is an autonomous 120 TEU container ship sailing fertiliser between ports at Herøya and Brevik. The Yara Birkeland was designed to serve as a proof of concept for a fully autonomous ship capable of global travel and with multiple functions (from industrial site operations, port operations and vessel operations).



Source: Yara International

²⁶ Transportation Research Part E: Logistics and Transportation Review Volume 73, January 2015, Pages 1-16: Productivity growth, scale economies, ship size economies and technical progress for the container shipping industry in Taiwan – wei-Ming Wu, Jenn-rong Lin.

Managing competitive pressures for Australian flagged and crewed vessels will remain a challenge over the medium term. A combination of investment in the latest technology and transition to larger vessels could potentially reduce the comparative gap created by higher labour costs.

The 2012 reforms (introduction of the Coastal trading Act 2012) coincided with a slowdown in the loss of capacity in Australian flagged vessels supplying capacity in the coastal trade. The reforms have also coincided with a plateau in the number of Australian flagged ships supplying capacity into international trade routes.

It is likely that further reform may be required to maintain and perhaps increase the current capacity of Australian flagged and crewed fleets in the medium term.

In the medium term to remain commercially viable the Australian fleet will likely need a combination of investment in new larger capacity ships, careful consideration of the most productive vessels for a particular trade route, adoption of the latest technology.

Government may need to consider policy options to level the playing field relating to Australian conditions and wages for Australian professional crews. This might include further increasing the seafarer tax offset (currently at 30 per cent) up to 100 per cent to encourage shipping companies to employ more Australian seafarers. New tax measures such as personal income taxes concessions for domestic seafarers could also be considered as foreign seafarers often do not pay income tax in their home countries, which significantly lowers operating costs of foreign vessels in Australia.

Australian flagged vessels need to operate profitably for companies to maintain investment in productivity enhancing technological innovations which will help to offset labour costs and maintain the fleets competitive position among strong global competition.

A careful analysis of investment options vs detailed operating costs relative to global competitors will be required to ensure that an Australian strategic fleet is commercially viable.

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Strategic Maritime Fleet Report:

Work Paper C

Maritime Workforce Analysis

DITRDCA

December 2022

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Overview

The maritime industry could benefit from an overhaul of current workforce practices, it suffers from perceptions of long hours, an old-fashioned culture and roles being traditional and manual. As a global industry, this could prove attractive to new entrants if the industry was to transform from current unattractive practices.

The maritime workforce is one of the least gender-diverse industries with 61 per cent of the workforce male, and a mere 16% of Australian apprentices are female.¹ The workforce has a high average age of 44.2 years and has an aging rate 2.6 times faster than the industry average.² The industry is regionally dispersed throughout Australia and possesses various niche skills to meet current requirements. The workforce could benefit from a focus on future requirements where technology and automation will be more prevalent for maritime activities at sea and shore based. There are lessons to be learned about managing diversity from sectors with cultural synergies such as mining.

To support adoption of maritime technology at sea and ashore, the maritime sector will require a workforce with skills and capabilities to support ships, ship technology, navigation, automation and remote operability. This will require a greater emphasis on skills for compliance and safety.

Training in Australia is characterised by difficulties in training capacity and accessibility. This includes a shortage of available training facilities and sea-based training billets. Shore-based facilities (such as mission bridge simulator) facilitate first-class training but require travel for most people to attend as the majority of the workforce or trainees, are not co-located. As the industry looks to scale, these pose limitations to achieving enhanced operability.

Opportunities exist to be innovative and leverage adjacent industry skills and capabilities; for example, to identify and support transferrable maritime workforce skills from transitioning Australian Defence Force (ADF) members (primarily Navy), with deep operational maritime experience and first-class training and education.

With technology disruption impacting this industry, there is further an opportunity to position the maritime sector as a high skilled and technologically advanced STEM-based sector offering valuable and transferable skillsets for its employment base. Building the size and capacity of the local maritime workforce will also reduce our reliance on international labour, given shortages in skilled labour within the global workforce being forecast for the forward period.

Current State of the Maritime Workforce

The Water Transport workforce – a niche employment group, with a core high-skilled component

The maritime workforce is at a key point in time with the increased adoption of technology and automation just around the corner. It has been a traditionally challenged workforce to maintain and train with ongoing

¹ https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IOv2.pdf pg.10

² https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IOv2.pdf pg.7

labour shortages and skills gaps due to the very specific nature of maritime industry employment roles and functions, which is likely to be exacerbated as it becomes more technology and automation focused.

There are approximately 66,000 accredited seafarers (accredited with the Australian Maritime Safety Association (AMSA)) and more than 28,000 other crew and other workers that service various industries including tourism, fishing, aquaculture, defence/navy, oil and gas, scientific services and search and rescue.³

In terms of the Australian workforce, (and as outlined below) most maritime-focused roles (*Maritime Transport*) are categorised within the *Transport, Postal and Warehousing* (TPW)) sector, which in total represents around 5.1% of primary Australian employment. This sector was the 8th largest growth employing industry, adding 53,300 roles in the five years to 2022.⁴

The *Maritime Transport* component of this sector represents about 5% of the TPW (or ~30,000 workers) and includes categories:

- Water Transport Support Services including ~20,300 workers
- Water Passenger Transport including ~5,100 workers
- Water Freight Transport including ~4,600 workers.⁵

Marine Transport Professionals (MTP) are the highest skilled component (Skill Level 2) of the Maritime Transport group representing approximately **10,600** workers that control and manage the operation of ships, boats and marine equipment including⁶

- | | |
|--------------------|------------------------------------|
| • Marine engineers | • Marine surveyors |
| • Ship's Masters | • Marine pilots (coastal and port) |
| • Ship's Officers | |

The duration of training for these roles differs based on the qualification requirements. Cert III/IV qualifications are usually obtained within a year, with Diploma and Advanced Diploma qualifications taking a year and two years respectively⁷. MTPs must also complete a specified amount of time serving on a vessel as part of their qualification, performing duties specific to their role. The duration of sea service is usually a minimum of 36 weeks.⁸

Notably, the Ship's Master is a key maritime occupation requiring prescribed seagoing experience. As outlined further in Appendix A, there are currently **3,600** Ship's Masters⁹ operating within the Australian workforce, in addition to **620** Ship's Officers being the pathway role to Ship's Master. The number of deck hands (General Purpose Hands), being a core seafaring role, although less skilled is **2,700**. The number of Marine Pilots is **272**.

³ https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IOv2.pdf

⁴ <https://labourmarketinsights.gov.au/industries/industry-details?industryCode=I>

⁵ <https://labourmarketinsights.gov.au/occupation-profile/marine-transport-professionals?occupationCode=2312>

⁶ <https://labourmarketinsights.gov.au/occupation-profile/marine-transport-professionals?occupationCode=2312>

⁷ <https://www.tafensw.edu.au/course-areas/maritime>

⁸ <https://www.gooduniversitiesguide.com.au/careers-guide/marine-engineer>

⁹ <https://labourmarketinsights.gov.au/occupation-profile/ship-s-masters?occupationCode=231213>

Comparing Maritime Transport Professionals to the Transport, Postal and Warehousing industry

The MTP workforce has a larger proportion of full-time workers than its parent industry (TPW), at 84% compared to 78.8%; this is also notably higher than the all-jobs average (65%)¹⁰.

Full-time MTPs work an average of 55 hours per week, 11 hours more than the all-jobs average.

However, the median weekly earnings of a MTP (\$2,998) are over double the median value for TPW employees (\$1,249). This is likely due to the difference in qualification requirements. The majority of MTPs have a Certificate III level qualification or above, whereas over half the workers in TPW are employed in lower-skilled jobs that do not need a post-schooling qualification¹¹. The Water Transport workforce is not limited to MTPs; a variety of enabling services are required for the maritime industry to function. Land-based transport support roles are typically categorised under Port and Stevedoring, while other support services (i.e., maintenance activities) also service a variety of industries.

Appendix A provides a snapshot of key MTP roles in addition to enabling roles and land-based support roles including gender demographics, skill level and location of employment and further analysis is provided below:

MTP workforce characteristics

The MTP workforce has a series of notable characteristics. The average age is 44.2 years, and the workforce on the whole is ageing 2.6x faster than all other industries.¹² The workforce is also heavily weighted towards male employees, who constitute 95% of the total, making MTP one of the least gender diverse sectors for employment (for example, women account for 18% of roles in the mining industry).¹³ The role with the highest female proportion is Fleet Manager at 26%, and most other roles are single-digit percentages; the all-jobs average for female workforce proportion is 48%.¹⁴

Work for MTPs

The geographical distribution of the workforce is localised predominantly to QLD (31.6%), NSW (23%) and WA (20%), and over half (57%) of MTPs live outside of capital cities. When compared to the all-jobs average of 38%, the MTP workforce is much more regional. The workforce distribution demonstrates that the bulk of work opportunity is located on the East coast, outside of capital cities; this is because much of maritime trade activity is related to sectors such as mining, oil, and gas sectors¹⁵ which are predominantly based in regional areas. A 2022 report into Water Freight Transport in Australia¹⁶ noted that 60.4% of freight movement occurred through bulk carrier services, associated with regional ports, and 25.2% were moved via container ship services. This data further demonstrates the regional localisation of work opportunity for MTPs.

Industries outside of maritime have demand for these maritime-specific skillsets, highlighting the diversity of opportunity for workers in this industry, and competing demand for these skills. Within the MTP cohort, a total of 59.8% of workers operate within the TPW sector, while the remaining breakdown is as follows:

¹⁰ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

¹¹ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

¹² https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IOv2.pdf

¹³ <https://www.australianmining.com.au/news/gender-diversity-grows-at-slower-than-preferred-rate/>

¹⁴ <https://labourmarketinsights.gov.au/occupation-profile/marine-transport-professionals?occupationCode=2312>

¹⁵ https://www.ldsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf

¹⁶ <https://www.ibisworld.com/au/industry/water-freight-transport/5030/>

- Agriculture and fisheries (9.2%)
- Manufacturing (6.9%)
- Public Administration and safety (6.9%)
- Other industries (16.1%)¹⁷

For roles, Ship Master and Ship's Officer, the proportion involved in TPW is 67.4% and 52.1% respectively, highlighting competing demands on these skillsets and diversified industry opportunities for workers.¹⁸

Forecasting for the maritime workforce

Historically Australia's maritime workforce has experienced a downward trend in participation with labour force data reporting a 7.3% workforce decline since 2009.¹⁹ There are a series of factors contributing to this downtrend. The decreasing Australian maritime fleet has been a key factor, as well as technological advances reducing the need for workers, but increasing overall tonnage. The role of foreign or migrant seafarers should also be considered, along with lifestyle factors and changing expectations about work (the Future of Work) appear to be of influence (discussed further below). Notably, national employment forecasts indicate:

- *Water Freight Transport* category is expected to grow by 2.7% to 2026, while *Water Passenger Transport* is expected to decrease in employment by 1.3% and *Water Transport Support* roles are expected to experience an increase of 11.3%.²⁰
 - This points to comparatively low or negative growth rates for seafaring roles with an above average increase in /enabling support or land-based roles within this sector.
- Within these groups, the MTP category is predicted to grow at 3.8% by 2026, highlighting a slightly higher demand trend for highly skilled workers.²¹
- Forecast growth in the maritime sector is below trend for TPW, which is projected to continue at 7.3%, employing 695,200 individuals by November 2026.²²

Drivers of employment supply and demand in the maritime sector

A range of economic, technology, and other societal factors are driving demand and supply for employment in the maritime sector:

- *Recent infrastructure investments in mining oil and gas projects* in WA (Kimberly, Pilbara, Goldfield-Esperance) have created commercial opportunities for shipping activity, increasing workforce demand.
- *Supply of Defence veterans* offer transferrable skills for the commercial maritime sector increasing supply.²³

¹⁷ <https://labourmarketinsights.gov.au/occupation-profile/marine-transport-professionals?occupationCode=2312>

¹⁸ <https://labourmarketinsights.gov.au/occupation-profile/ship-s-officers?occupationCode=231214>

¹⁹ <https://labourmarketinsights.gov.au/occupation-profile/ship-s-officers?occupationCode=231214>

²⁰ <https://labourmarketinsights.gov.au/media/2pgcvidj/2021-isa-employment-projections.xlsx>

²¹ <https://labourmarketinsights.gov.au/media/2pgcvidj/2021-isa-employment-projections.xlsx>

²² <https://labourmarketinsights.gov.au/media/2pgcvidj/2021-isa-employment-projections.xlsx>

²³ <https://www.msq.qld.gov.au/-/media/MSQInternet/MSQFiles/Home/About-us/News-and-media/Maritime-Jobs-Taskforce-report.pdf?la=en>

Attractiveness of the maritime industry to workers

In terms of the attractiveness of the maritime industry, the *Queensland Transport and Logistics Workforce, Current and Future Trends Report* (2018) pointed to challenges across all transport sectors. Factors that influence the attractiveness of the industry include *Aging workforce* (across all transport sectors); *predominantly male workforce*; *lack of coordinated training* (resulting from growing competition for workers meaning that employers do not invest in training), *industry perceptions* (including long hours, old fashioned culture, roles being traditional and manual).²⁴

MTPs are paid more than TPW counterparts, but not all consider their remuneration to be sufficient.²⁵ While information on the wages for specific roles is unavailable, making conclusions about individual roles are difficult to draw. However, MTPs on the whole have median hourly earnings of \$74, approaching double the all-jobs median of \$41. Nonetheless, in its 2019 survey, the *Australian Industry Standards Maritime Industry Reference Committee* (IRC) noted that 78% of employers were experiencing skills shortages and the primary reason was noted as *wages being considered too low*.²⁶ This likely indicates that workers perceive their skills to be of higher value than the current rates of remuneration offered.

Of note, a key reason for employment shortages was the *cost and time to achieve the required qualification*, followed by *aging workforce or current staff retiring*, while *competition from other organisations* was ranked 4th, followed by *geographic location of the vacancy*.²⁷ An ageing workforce is a significant challenge for the maritime workforce, as skills and deep experience are at risk of being lost. Conversely, lifestyle factors can influence demand and supply of labour with access to training being a further theme, while a lack of diversity can reduce the size of the labour pool. From a global competition perspective, Australia has lower income tax incentives for mariner incomes, for example, allied nations (the UK), the Philippines and other nations' policies.²⁸

Shipping is a global industry and thus employment opportunities for seafarers are international. As a result, organisations have access to a global marketplace to secure qualified maritime workers. It has been reported that this circumstance provides a disincentive for organisations to invest in training Australian crews, particularly due to the significant investment that is required.²⁹ Skills can also be acquired overseas at a lower cost, and quicker. Further, a *Maritime Industry Australia Limited (MIAL)* submission to Parliament on post-COVID skills noted that qualified Australians are not available to perform roles when needed, given current shortages and tendencies towards casual, short-term working arrangements³⁰. This suggests that industry labour market structural problems, reinforced by the economics of the industry and commercial factors, are also influencing structure of the workforce.

²⁴ <https://www.msq.qld.gov.au/-/media/MSQInternet/MSQFiles/Home/About-us/News-and-media/Maritime-Jobs-Taskforce-report.pdf?la=en>

²⁵ <https://labourmarketinsights.gov.au/industries/industry-details?industryCode=I>

²⁶ <https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/MAR-SF-FULL-2019.pdf>

²⁷ <https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/MAR-SF-FULL-2019.pdf>

²⁸ <https://navalinstitute.com.au/wp-content/uploads/Protecting-Australian-Maritime-Trade-Report-2022-Final-version.pdf>

²⁹ https://www.ldsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf

³⁰ <https://mial.org.au/wp-content/uploads/2022/09/210301-MIAL-Final-Submission-to-Joint-Standing-Committee-on-Migration-Review-of-Skilled-Migration-Program.pdf>

Local Industry Skills shortage and positional gaps

Industry has reported expectations around skills shortages based on forecast requirements, current training levels and the rate workers leaving the workforce (including due to an ageing workforce). In terms of national capability, skills shortages have been widely recognised with shortages in the following areas:

- Marine engine drivers
- Engineers
- Deck hands (General Purpose Hands)
- Managers
- Ships Engine and feeder occupations (Boiler or Engine Operator)
- Ship's Surveyor
- Navigation³¹

Further, for *Crew members* a headcount gap has been reported that is impacting the ability to effectively crew maritime, shipping and water transport roles. This is a challenge in particular as the size of the water transport work as of 2021 is expected to decrease at a rate of 0.7% p/a to 13,202 in 2026³².

Secondly, the *Engineering Workforce*. A skills gap has been reported in regulatory comprehension for the engineering workforce³³. The maritime industry is incredibly complex and requires a sophisticated and well skilled engineering workforce that can deliver on current and future state workforce requirements.

Master Fisher, Ship's Officers, deck hands and fishing hands (headcount gap). The *National Skills Commission* indicates the industry is experiencing moderate demand which may widen in future years. This further extends to *Harbour Master, Ship's Master, Marine Surveyor, Marine Pilots, Ship's Engineer* and shore-based jobs where employers are finding it difficult to replenish the workforce due to limitations on training pathways or cadetships in key states³⁴. Industry reports that the lack of 'blue water' Australian flagged merchant vessels results in a low number of qualified mariners to key, shore-based jobs in Ports & Stevedoring, meaning employers must source skilled migrant workers or experience operational limitations.³⁵

International Seafarer Labour Forecasts

Drewry Shipping Consultants research indicates that core drivers of supply and demand for maritime labour in the global marketplace include:

- Project fleet growth, particularly in dry bulk and LNG
- Global fleet growth to 2027 is forecast at 66,000 additional officers
- Officer supply remains slow, largely driven by wage stagnation, retirement for seafarers in their 50s and the attractiveness of other land-based industries that are competing for talent.³⁶

³¹ https://www.ldsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf, Queensland Transport and Logistics Workforce, Current and Future Trends Report (November 2018), Australian Industry Standards, Maritime Skills Forecast 2019

³² <https://www.ibisworld.com/au/industry/water-freight-transport/5030/>

³³ <https://www.amsa.gov.au/sites/default/files/maritime-skills-availability-study.pdf>

³⁴ <https://www.msq.qld.gov.au/-/media/MSQInternet/MSQFiles/Home/About-us/News-and-media/Maritime-Jobs-Taskforce-report.pdf?la=en>

³⁵ Logistics and Defence Skills Council, Ports and Stevedoring, Industry Profile: Ports & Stevedoring, July 2022

³⁶ Drewry – Manning Shipping Consultants Limited 2022 - Annual Review and Forecast 2022/23

At the start of 2022, Drewry cautioned against an increasingly imbalanced composition between seafarer supply and demand. Officer supply grew a mere 0.8% (partially due to the pandemic), whilst demand for officers rose 3.0% - up from 2.4% in 2021.³⁷ Although the growth in seafarer supply has stagnated in recent years, it is expected to rise by 6.3% in 2027. Concerningly, Drewry noted slow growth in officer supply, rising to 1.1% by 2027 and further diverging from demand.

Drivers of seafarer demand

Seafarer demand is mainly driven by growth in the global fleet size. The increase in the number of global merchant vessels is closely related to the level of seafarer labour demand. As such, strong returns in the shipping industry should reflect an increase in seafarer wages as ship owners, incentivized by higher potential returns, increase their willingness (and ability) to pay.

*Drewry's five-year forecast expects an expansion in global fleet numbers of 3,920 vessels by 2027, resulting in an additional officer demand of 61,400 officers.*³⁸

Breaking this down by each sector:

- Containers and dry bulk are expected to require an additional 13,200 and 17,100 officers respectively.
- Tanker vessels, at an additional 16,300 officers required, are considered most significant due to holding the highest leave ratios, shortest voyage length, whilst requiring the highest training and experience standards relative to other sectors.³⁹

Labour demand has likewise increased, as evidenced by the level of the crewing back-up ratios required by shipping companies. This follows a market shift towards increased personal leave, extended training and handover periods, and occasionally shorter contractual terms of duty to attract workers.

In a tightening labour supply market, employers have had to compete not only via increased wage rates, but also through other compensatory benefits, such as leave, which further drives a shortage of required crew.

Drivers of seafarer supply

Officer supply is primarily driven by rising wage rates and perceived attractiveness in career opportunities. Stagnating wage growth, rising rates of retirement (further exacerbated by the pandemic), and reducing levels of attractiveness for career prospects have diminished growth in supply.

Drewry's five-year forecast expects rising growth in officer supply by just over 1% annually by 2027, representing an increase of 40,767 officers and expanding the available pool to 692,036 officers.⁴⁰

This is expected to result in a net deficit of 55,685 officers by 2027.

Furthermore, breaking this down by Officer rank and skillset, it is likely that tight labour market supply conditions will be localised to specific vessels and the required expertise.⁴¹ Already, senior-level positions

³⁷ Ibid. pg.13

³⁸ Drewry - Manning Consultants Limited - Annual Review and Forecast 2022/23 pg.19

³⁹ Ibid. Pg.19

⁴⁰ Ibid. pg.22

⁴¹ Ibid. pg.22

are more difficult to fill than junior-level positions; Drewry specifically mentions 2nd engineers, as well as ETO and cargo (gas) engineers.⁴²

For ratings, the labour market continues to indicate a surplus of workers due to shorter training periods and lower entry requirements - allowing for a bigger pool. This has led to relatively lower wages, leading to increased competition from shore-based employment opportunities.⁴³

This forecast shortfall in skilled maritime labour within the global market will have implications for Australia's capacity to crew ships if we rely heavily on the global market to meet local workforce needs. These forecasts point to the importance of approaches and strategies to build local training capacity within our maritime workforce and to ways to prevent the loss of skilled labour to the offshore (international) operations.

Training

Current training arrangements and pathways

Training in the maritime sector is regulated with AMSA holding legislative responsibility certification of all crew members on Australian ships operating under the Navigation Act 2012 and in meeting Australia's obligations under the International Convention on Standards, Training, Certification and Watchkeepers for Seafarers 1978 (STCW).⁴⁴ AMSA oversees various Certificate of Competency for maritime skillsets.

Crew members require STCW approved courses to be able to operate on a vessel longer than 80m in length. This applies to all roles within a vessel of this size including but not limited to General Purpose Hands, Engineers, and Marine Cooks. All courses provided in Australia are required to meet quality and assurance to ensure compliance with international maritime law and AMSA certification. All crew members must have a stated length of sea going experience on vessels to comply with training requirements before career progression.

Any vessel under 80m in length and ships propulsion under 3000 kW engaged on near coastal voyages within Australia's Exclusive Economic Zone (EEZ) requires National Standard for Commercial Vessels (NSCV) as set out in Maritime Order 505.⁴⁵ Crew members onboard these vessels must complete a minimum length of sea going experience to progress their qualifications and training relevant for NSCV. Qualifications on NSCV does not automatically promote to STCW but can be considered when applying for similar courses by AMSA approved Australian providers as recognized prior learning towards competency.

Maritime Industry Census

As described in Maritime Industry Australia Census, 97 organisations directly employed 977 ex-seafarers, (being those without current STCW but working at sea experience) and 4,669 "seafarers" with current STCW. A total 34 of these organisations employ a mixture (Est 33%) of both staff working At-sea and working ashore.⁴⁶

⁴² Ibid. pg.23

⁴³ Ibid. pg.18

⁴⁴ https://www.ldsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf

⁴⁵ <https://www.amsa.gov.au/about/regulations-and-standards/marine-order-505-certificates-competency-national-law>

⁴⁶ <https://mial.org.au/wp-content/uploads/2022/09/MIALSeafaringSkillsCensus.pdf>

Of 40 organisations surveyed in 2018, a total of 22 contributed to new entrant training, or training sponsorship, or anticipate that they will contribute toward training for At-sea roles in Maritime sector. These contributions went towards 127 “Seafarer” cadets of which they were broken down into

- 50 Ratings Trainees
- 42 Engineer Officer Cadets
- 33 Deck Officer cadets
- 2 Electro Technical Officer trainees

Of these training positions, it is assessed that not all 127 Seafarer cadets were from that year as some roles reach qualification over 3 years. However, of this number, only 54 berths were identified as currently available for training. Data relating to training over 2018-2023 reflected the training of 141 Seafarers. This is below the 542 industry expected requirements by 2023.

Of the 40 organisations identified, a total of 17 had capacity to provide the 54 berths. A further break down assesses that of the 22 identified as contributing to new entrant training, a total of 5 were unable to provide berths for training and relied on others. These organisations that contributed stated they could provide a much larger capacity of 60 berths for training purposes. Currently, they do not utilize 50% of their berth capacity due to lack of entrants.

Included in this survey, responses provided by 97 Shore-based organisations, only 38 contribute to training of At-sea roles which did not involve New Entrant training. This is the minority with 59 Shore-based organisations not contributing to any form of At-Sea training.

A response of **costs** was provided for why Seafarer employers did not contribute additional funding towards training. This response was consistent across At-Sea and Shore-based training opportunities.

Overall, the maritime industry includes 18 qualifications, 36 skillsets and 179 units of competency with 61 registered training organisations.⁴⁷ The MAR: Maritime Training Package (MAR) specifies the skills and knowledge required to effectively fulfil maritime occupations. Training is provided in various formats including private training (56.1%) and TAFE (33.8%), with some universities and community education providers also offering courses.⁴⁸ Role opportunities for training pathways are outlined below:

- Certificate I Course
 - *Occupations:* General Purpose Hand (Near Coastal), Coxswain (Grade 2 Near Coastal)
- Certificate II Course
 - *Occupations:* Linesperson, Coxswain (Grade 1 Near Coastal), Marine Engine Driver (Grade 3 Near Coastal)
- Certificate III Course
 - *Occupations:* Vessel Traffic Services, Marina Operations, Integrated Rating, Marine Cookery, Marine Engine Driver (Grade 2 Near Coastal), Ships Master (up to 24m Near Coastal), Ships Master (Inland Waters)
- Certificate IV Course
 - *Occupations:* Chief Integrated Rating, Marine Engine Driver (Grade 1 Near Coastal), Master (up to 35m Near Coastal)
- Diploma
 - *Occupations:* Marine Engineering, Maritime Operations
- Advanced Diploma

⁴⁷ https://www.australianindustrystandards.org.au/wp-content/uploads/2020/08/20210609_MAR_IOv2.pdf

⁴⁸ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

- *Occupations:* Marine Engineering (Class 1), Maritime Operations (Master Unlimited).⁴⁹

Prime maritime occupations require a qualification of Ship's Master with prescribed seagoing experience as a ship's Captain. The mining and oil and gas sectors require a Ship's Master with 10 years of experience plus other specialist qualifications due to the nature of dynamic position and higher risk profile cargo movements.⁵⁰

Training demand

In their 2019 Maritime Skills Forecast, the *Australian Industry Standards* reports that at the National Level, qualification enrolments in MAR Training Packages have decreased by nearly 8% in the four years (since 2019) prior, while Units of Competency enrolments have decreased by nearly 7%.⁵¹

This information is consistent with findings from the *Australian Industry and Skills Committee*, which reported program enrolments having declined overall from roughly 6,320 in 2016.⁵²

The total number of enrolments in maritime-related qualifications in 2020 was 5,880. Enrolments by qualification type were as follows:

- 36% Certificate III (2,119 enrolments)
- 35% Certificate II (2,042 enrolments)
- 22% Certificate I (1,323 enrolments)
- Certificate IV and Diploma / higher level qualifications had less than 500 enrolments between them.⁵³

However, program completions increased steadily between 2016 and 2019, although there was a decrease between 2019 and 2020 with 4,080 and 3,430 respectively. Between 2016 and 2020, the course completion rate fluctuated from between 30% in 2017 to 50% in 2019 and 24% in 2020. This may reflect the impact of the COVID-19, nevertheless, there is a clear long-term decreasing trend in maritime training.⁵⁴

The long-term course commencements in 2020 were for near-coastal qualifications with Ship's Master the main course aim for outcome-based training, followed by Ship's Engineer and Deck Hand with the majority on Near Coastal courses.

This can be broken down into the following:

Course	Near Coastal	Blue Water
Deck hand	931	162
Ships Engineer	1037	53
Ships Master	3626	34
Ships Officer	0	15
Total	5594	264

⁴⁹ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

⁵⁰ https://www.idsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf

⁵¹ <https://www.australianindustrystandards.org.au/skills-forecast/maritime-industry-outlook/>

⁵² <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

⁵³ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

⁵⁴ <https://nationalindustryinsights.aisc.net.au/industries/transport/maritime>

Training gaps

Training is a notable gap which has been identified in key policy and industry literature. The gaps currently exist for the maritime workforce to efficiently and effectively advance from initial skillsets to higher marine qualifications that are vital to the industry's core activities.⁵⁵ It is anticipated that this will continue to broaden for key roles including chief engineers, masters, marine pilots, and harbour masters – all of which are critical to this industry. Industry has identified an opportunity to encourage entry level seafarers in the Australian maritime workforce, alongside financial incentives for internationally based Australian seafarers, with the view of helping to maintain a high level of key skills and experience particularly in the marine pilotage and port-based services areas.⁵⁶

Australian Industry Standards reports that there are no Australian oil or chemical tankers available for Deck or Engineer Officers to obtain the required sea services for these types of vessels.⁵⁷ There is also a lack of Australian LNG Carriers making it difficult for engineers to have the required sea service required for endorsement. Limited positions force senior mariners to accept more junior positions, while other skilled roles often being taken up by overseas trained workers, making the training of Australians uneconomic.⁵⁸

As noted above, the 2019 MIAL survey suggests that a key factor is also the cost of training. In total 17 organisations in Australia provided 54 berths that are used for maritime training. However, 11 of the 17 organisations reported that they have additional capacity totaling 60 berths that could be used, suggesting that there is more than double the infrastructure capacity available in the market.⁵⁹

Further, a 2020 Senate Standing Committee Enquiry noted that the consequences of training gaps could be greatly detrimental to a number of areas reliant on maritime activity. Of particular note and concern were fuel security, imports and exports, maritime safety, and emergency management. Cost was also identified as a key barrier to conducting additional seafarer training, and that a shortage of 560 seafarers is expected by 2023.⁶⁰

It has been suggested that access to overseas trained labour means that operators are disincentivised from training Australian crew as it is not commercially viable to do so.

However as noted above, forecast shortages in the supply of skilled seafarers within the international labour market may create a bottleneck within Australian's maritime sector moving forward.

Future Workforce

The challenge of an aging workforce and evolving expectations about work that exists within this sector is not unique to Australia, nor to the maritime industry; these challenges exist in other sectors including

⁵⁵ <https://www.amsa.gov.au/sites/default/files/maritime-skills-availability-study.pdf>

⁵⁶

[https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural and Regional Affairs and Transport/Shipping/Report/section?id=committees%2Freportsen%2F024290%2F75585](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/Shipping/Report/section?id=committees%2Freportsen%2F024290%2F75585)

⁵⁷ Australian Industry Standards, Maritime Skills Forecast 2019

⁵⁸ Australian Industry Standards, Maritime Skills Forecast 2019, p.28.

⁵⁹ <https://mial.org.au/wp-content/uploads/2022/09/MIALSeafaringSkillsCensus.pdf>

⁶⁰ [https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural and Regional Affairs and Transport/Shipping/Report/section?id=committees%2Freportsen%2F024290%2F75585#footnote27target](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/Shipping/Report/section?id=committees%2Freportsen%2F024290%2F75585#footnote27target)

across heavy industries that have cultural synergies with maritime such as mining and oil and gas sector. PwC's "Future of Work" report provides insights about emerging expectations of work that can be applied to this sector. The work involved a survey of 1,800 Australian workers across various demographic groups, regional, city, ages groups and levels of seniority and outlined findings regarding changing expectations of work (Future of Work) ⁶¹. Key findings included that:

While **reward and remuneration** was the no 1 priority for 25% of the cohort regarding their value of work, **wellbeing** was the top priority for 22% of the cohort. Wellbeing includes *mental health support, wellness benefits, lifestyle benefits and health and wellbeing support*.

Experience was the 3rd highest preference, accounting for the no 1 choice for 16% of the cohort. Experience reflects *culture, diversity and inclusion, support and relationships networks, team spirit and energy and co-workers*. Other priorities in order of preference include *ways of working* (technology enablement, flexibility, travel, autonomy); **career development** (learning and upskilling, quality of leadership, access to mentoring and coaching, career pathways); **brand** (prestige, affiliation, volunteering and ESG, social responsibility) while **workspaces and workplaces** was the least preferred choice (physical office, workplace perks, location, hybrid environment).

Perceptions of Maritime Work

Alongside access to training facilities, the future capability of our national maritime sector will be contingent on its ability to transition to the Future of Work. Given the physical realities and cultural characteristics of the work, this presents challenges for this sector. Seafaring has been reported as a 'risky occupation' in terms of physical and mental health with workers exposed to stressors including social isolation, poor physical work conditions and long work hours.⁶²

As noted by the *Queensland Government, Maritime Jobs Taskforce Report (September 2020)*, Maritime work is often undertaken outside of 'normal' hours, in offshore and coastal environments, out of view of the mainstream community, in physically protected and secure boating facilities and with the ever-present commercial and competitive pressures.⁶³ These factors do not readily promote the development and nurturing of a shared communication framework.

The perceptions of young people should also be taken into consideration. Over March 2021, the UK Government undertook a study involving 2,326 young people (16-24 years of age) to understand their knowledge of the aviation and maritime sectors.⁶⁴ The study found that:

- Knowledge of the maritime industry was very low which presents the greatest challenge when it comes to improving perceptions of the sector among young people. Just over half (51%) of young people said that they *knew almost nothing* about what people working in the sector do
- In terms of barriers to pursuing a career in maritime, *lack of interest in* (67%) *and awareness of job roles* (23%) in maritime were the main reasons for not considering this sector.
- Most young people drew perceptions of maritime careers from the Royal Navy adverts, and this appeared to contribute to views that the industry lacked diversity (with individuals in the adverts tending to be 'white men').

⁶¹ <https://www.pwc.com.au/important-problems/future-of-work/what-workers-want-report.pdf>

⁶² <https://bmcpyschology.biomedcentral.com/counter/pdf/10.1186/s40359-022-00850-4.pdf>

⁶³ <https://www.msq.qld.gov.au/-/media/MSQInternet/MSQFiles/Home/About-us/News-and-media/Maritime-Jobs-Taskforce-report.pdf?la=en>

⁶⁴ <https://www.gov.uk/government/publications/aviation-and-maritime-careers-young-peoples-perceptions>

- In focus groups, when young people were prompted with land-based job roles and roles that related to sustainability interest in the sector improved⁶⁵.
- Perceived characteristics of Maritime jobs acted as deterrents to some extent, with a lot of young people concerned about *being lonely / away at sea for long periods of time*, lack of flexible working hours and irregular working hours. Insights from qualitative fieldwork indicated that these views were largely focused on sea-based roles.

These findings suggest that more needs to be done to address the image of the sector and build a positive culture that prioritises wellbeing and experience, notwithstanding the physical challenges of being away at sea.

AMSA reports that currently women represent just 1.2 per cent of the seafarer work force worldwide, which points to cultural challenges with this industry meeting future requirements for work.⁶⁶ In terms of diversity, there are synergies with and lessons to be gained from, the experiences of other heavy industries in address diversity issues. For example, diversity has become a key workforce issue for this sector.⁶⁷ Reports suggest there is much to be done to address this issue; and there are few female roles models in the industry to lead the change.⁶⁸

Other challenges impacting the workforce include:

Revenue volatility and job security perceptions: The maritime industry is sensitive to a number of variables, particularly in the context of import and export, and global events, due to the global nature of the industry which can impact job security. As a result, the industry has been placed under revenue pressure, particularly in the last five years.⁶⁹ With an increase in revenue pressure comes a decrease in risk appetite to grow a capable maritime workforce. Indicative evidence suggests that commercial factors within maritime businesses are impacting on the national skills shortage; notably it is more cost-effective for organisations to secure migrant labour as opposed to training Australian crew, particularly for skilled roles such as Ship's Master and Officer.

Business Practices: The Australian maritime sector is a complex ecosystem of legal, commercial and regulatory requirements involving both private and public stakeholders and various supporting business practices. In the maritime sector contracts are often entered into based on expectations of prices and future availability, and when there are unanticipated disruptions or shocks, workforce productivity can decrease.⁷⁰ This is due to the scale and scope of coastal trade and the interdependencies that exist in executing efficient and effective maritime operations. At present, it has been reported that Australian container ports are estimated to cost the Australian economy \$605m per year in inefficiencies due to poor ship turnaround times and an inability to execute efficient practices across legal, commercial and regulatory requirements that directly impact workforce productivity.⁷¹ A further example relates to contractual agreements and the impact on the workforce.

⁶⁵ <https://www.gov.uk/government/publications/aviation-and-maritime-careers-young-peoples-perceptions>

⁶⁶ <https://www.amsa.gov.au/women-maritime>

⁶⁷ <https://www.australianmining.com.au/features/diversity-in-mining-gains-momentum/>,

<https://www.australianmining.com.au/news/more-women-more-safety-needed-in-mining/>

⁶⁸ <https://www.marineinsight.com/life-at-sea/7-fewer-women-seafarers-in-the-maritime-industry/>

⁶⁹ <https://www.ibisworld.com/au/industry/water-freight-transport/5030/>

⁷⁰ <https://nationalindustryinsights.aisc.net.au/industries/transport/transport-and-logistics>

⁷¹ <https://theloadstar.com/australias-inefficient-ports-costs-cargo-owners-a605m-per-year-claims-government-report/#:~:text=It%20says%3A%20%E2%80%9CInefficiencies%20at%20Australia's,these%20costs%20across%20the%20economy.%E2%80%9D>

Competition with overseas vessels: The Australian maritime industry is impacted by competition from overseas vessels for a share of coastal trade within Australia. Vessels with larger capacity within their network, and greater economies of scale often take on the lion's share of coastal trade opportunities and services. As noted above, Australia sources migrant labour for key port occupations (listed on the Skilled Migration List): Master Unlimited, Specialist Managers, Harbour Master and Deputy Harbour Master, Marine Surveyor (also known as Ship's Surveyor) and Vessel Traffic Officer (VTO).⁷²

COVID-19: COVID-19 has and will continue to impact business as usual. Mobilising workforces and bedding down long-term contracts are two key challenges that, even today, are driving inefficiencies and limiting the workforce.⁷³

Technological transition

The maritime industry in Australia and overseas is undergoing a major transformation with the onset of new technological advances in areas such as automation and autonomous systems, digitisation and navigation. AMSA has recently approved the operation of an unmanned surveillance vessel which will operate in conjunction with human supervision.⁷⁴ The development and trials of electric and autonomous ships are also underway.⁷⁵

As businesses and governments adopt maritime technology at sea and ashore, the maritime sector will continue transforming to keep pace, which in turn will require a workforce with skills and capabilities to support ships, ship technology, navigation, automation and remote operability. Workforce training will be required to ensure compliance and safety and have the skills and knowledge to operate them. Furthermore, the transition to a low carbon economy will require skillsets in dealing with green fuels and propulsion technologies.

The digitation of operations will involve greater risks of cyber-attacks and workforce skills need to be progressively developed to minimise the risk and be capable of reinstating digital systems as quickly as possible should a cybersecurity incident occur, including compliance with regulatory requirements.

However, this transition is not unique to maritime; other key industries such as mining, communication and energy will also require skillsets critical for the transition to future technologies.⁷⁶

Environmental transition

A Maritime 'Just Transition for Seafarers' Task Force (Task Force) was established in November 2021 by the International Chamber of Shipping (ICS), the International Transport Workers Federation (ITF), the United Nations Global Compact, the International Labour Organisation (ILO) and the International Maritime Organisation (IMO) with the aim for a just and human-centred decarbonisation of the shipping industry.⁷⁷

⁷²https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/Shipping/Report/section?id=committees%2Freportsen%2F024290%2F75585

⁷³ Logistics and Defence Skills Council, Ports and Stevedoring, Industry Profile: Ports & Stevedoring, July 2022

⁷⁴<https://nationalindustryinsights.aisc.net.au/industries/transport/maritime#:~:text=Employment%20trends&text=The%20employment%20level%20in%20the,2020%20to%206%2C900%20in%202021>

⁷⁵ Australian Industry Standards, Industry Outlook 2021, Maritime Industry Refence Committee.

⁷⁶ <https://www.industry.gov.au/news/2022-update-list-critical-technologies-national-interest-have-your-say>

⁷⁷ <https://www.ics-shipping.org/wp-content/uploads/2022/11/Position-Paper-Mapping-a-Maritime-Just-Transition-for-Seafarers-%E2%80%93-Maritime-Just-Transition-Task-Force-2022-OFFICIAL.pdf>

The Task Force stated 10-point Action Plan to achieve a Just Transition:

- Global Labour Standards
- Gender and Diversity
- Health and Safety
- Establish Consensus to unlock training
- Investing in Skills
- Support seafarer career pathways
- Address attrition and recruitment
- Strengthening global training standards
- Delivering fair training
- Monitoring skills

The Task Force is targeting the STCW training requirements to be foundation part of Maritime industry workers thinking more environmentally. The impact towards workforce is based on aims of training a more environmentally efficient standard across the Maritime sector. This will have impact upon the local training organisations to ensure this course was offered as part of the updated STCW and in training new joiners to the industry. The future workforce will require training facilities and equipment to ensure qualified people are readily employed.

The Task Force identified rising costs on fuel and lack of future options will have an impact on training ability of organisations. The lack of planning on transition fuels towards more environmentally sustainable alternatives, identified the workforce was unable to provide qualified personnel who can work within this space. More long-term goals allow training organisations to plan either short- or long-term course options that qualify seafarers in new environmentally friendly fuel sources.

Future workforce requirements

The *Maritime IRC* has noted skills shortages in the following areas, reflecting technological changes in the maritime industry.⁷⁸ These skills will be critical as the industry transforms:

- Autonomous vessels
- Tech-based operational systems
- Satellite-based augmentation system (SBAS)
- Remotely piloted aircraft systems (RPAS)
- Autonomous underwater vehicles (AUV)
- Autonomous container ships and vessels
- Dynamic positioning (DP) systems
- E-navigation
- Complex Communications systems

Future training requirements

There is an opportunity to further identify and support transferable maritime workforce skills from transitioning Australian Defence Force members.⁷⁹ With deep operational maritime experience and first-class education and training, this is a significant opportunity that can help resolve the workforce challenges in scaling a Strategic Maritime Fleet. Access to seagoing experience is a critical enabler for the maritime workforce. A Strategic Maritime Fleet enables more seagoing billets for trainees, and a higher number of qualified members of the maritime workforce.

State Governments and port authorities have a key role to play in developing Pathways programs to support apprenticeships and trainees.

⁷⁸<https://nationalindustryinsights.aisc.net.au/industries/transport/maritime#:~:text=Employment%20trends&text=The%20employment%20level%20in%20the,2020%20to%206%2C900%20in%202021>

⁷⁹ https://www.ldsc.asn.au/uploads/1/3/4/3/134319945/2022_maritime_indprofile.pdf

Appendix A

Key maritime roles

Maritime Sector: Maritime Transport Workforce Data											
Occupation	Certification level	Number employed	Weekly earnings	Projected employment (Nov 2026)		Workforce demographics			Workforce geography		
				Growth	Level	Full time %	Female %	Average age	% by state	% living outside capital cities	Most populated regions
Aggregated MTPs	Diploma or Advanced Diploma	10,600	\$2,998	3.8%	12,700	84%	5%	46	QLD (31.6) NSW (23) WA (20)	57%	Not available
Marine Engineer	Diploma or Advanced Diploma	1,900	Not available	Not available		93%	2%	45	QLD (26.2) NSW (25.9) WA (19.3) VIC (12.1)	49%	SW Perth
											Cairns
											Gold Coast
											Sunshine Coast
											Newcastle/Lake Macquarie
Ship's Officer	Diploma or Advanced Diploma	620	Not available	Not available		93%	9%	38	QLD (24.4) NSW (23.6) WA (21.8) VIC (12.5)	45%	Cairns
											SW Perth
Deck Hand	Cert II/Cert III	2,700	Not available	Not available		78%	12%	39	QLD (27.6) NSW (27.4) WA (20.3)	58%	SW Perth
											Mackay-Isaac-Whitsunday
											Cairns
											Central QLD
											NW Perth
Marine Surveyor	Diploma or Advanced Diploma	460	Not available	Not available		82%	2%	51	WA (26.9) QLD (26.4) NSW (19.6) VIC (15.6)	36%	Not available
Ship's Master	Diploma or Advanced Diploma	3,600	Not available	Not available		80%	4%	48	QLD (37) NSW (23.7) WA (18)	63%	Cairns
											Mackay-Isaac-Whitsunday
											SW Perth
											Central QLD
Other MTPs*	Diploma or Advanced Diploma	500	Not available	Not available		91%	19%	44	QLD (29.6) NSW (27.6) WA (16.3) VIC (12.9)	55%	Gold Coast
											Not available

*Other MTPs include roles such as: Marina Operations, General Purpose Hands, Boating Safety Officer, Marine Safety Officer, and Vessel Traffic Officer.

Enabling services and land-based supply chain: workforce data										
Occupation	Certification level	Number employed	Weekly earnings	Projected employment (Nov 2026)	Workforce demographics			Workforce geography		
				Growth	Full time %	Female %	Average age	% by state	% living outside capital cities	Most populated regions
Maritime Business and Port Services - Waterside workers	None	3,200	Not available	Not available	68%	4%	46	VIC (22.6) NSW (27.6) QLD (17.5)	42%	SW Perth Illawarra W Melbourne E Brisbane W Adelaide
Maritime Business and Port Services – Importers, exporters and wholesale	Extensive experience	26,100	\$2140	8%	81%	25%	48	NSW (34.7) VIC (29.9) QLD (17.8)	28%	Not available
	Commerce qualification (University or VET)									
Maritime Business and Port Services – Supply, distribution and procurement managers	Extensive experience	37,600	\$2,698	3.5%	94%	22%	45	NSW (34.5) VIC (28.1) QLD (17.3)	28%	Not available
	VET or University qualification in a related field (e.g. business management)									
Maritime Business and Port Services – Boat builders and repairers	Cert II/ Cert III	2,300	Not available	Not available	87%	2%	41	QLD (41.9) NSW (16.9) VIC (16.2) WA (14.3)	56%	Gold Coast SW Perth E Brisbane Hobart Morningson Peninsula
Maritime Business and Port Services – Shipwrights	Cert III	810	Not available	Not available	88%	1%	41	NSW (40.7) QLD (14) SA (12.4) WA (19.6)	37%	SW Perth Northern Beaches
Maritime Business and Port Services – Crane, Hoist and Lift Operators	None	14,100	\$2,438	0.4%	90%	3%	44	NSW (29.8) QLD (23.3) VIC (19.6) WA (17.3)	52%	SW Perth Illwarra W Melbourne Central QLD Gold Coast W Melbourne
Maritime Business and Port Services – Storepersons	None	169,800	\$1,134	6.2%	73%	21%	38	NSW (32.5) VIC (28.3) QLD (19.5) WA (10.3)	30%	SE Melbourne Blacktown SW Sydney Parramatta
Maritime Business and Port Services – Transport Services Managers	None (but some relevant industry experience)	19,300	\$2,664	3.8%	86%	18%	48	NSW (30) VIC (26.9) QLD (23.2) WA (10.4)	42%	Not available
Marine Cooks	Not available									
Land-based supply chains – forklift operators	None	67,900	\$1,286	2%	86%	4%	42	NSW (31.6) VIC (31.4) QLD (17.8)	31%	W Melbourne SE Melbourne Blacktown SW Sydney N Adelaide
Land-based supply chains - truck drivers	None	137,200	Not available	Not available	87%	3%	48	NSW (30.8) VIC (23.1) QLD (22.8)	53%	W Melbourne SE Melbourne SE Perth Logan-Beaudesert Blue Mountains
Regulatory (e.g. Field Safety Specialist)	Not available									

Strategic Maritime Fleet Report: Disruption Analysis of the Australian Maritime Industry and Growth Potential

Paper D

DITRDCA

December 2022

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Scenario 1: Disruption of international shipping lanes to the north, impacting access to containerised freight (constrained imports)

Describe the scenario

Overview

Under this scenario, we assume that freight flows through the South China Sea (SCS) are constrained (either due to a conflict or weather event) resulting in a 20% drop in containerised imports arriving in Australia. There may be value in a Strategic Fleet undertaking coastal calls that would otherwise be undertaken by international vessels (under licence), hence enabling the international fleet to concentrate activity on international transits and thereby, help to address the shortfall in international transit capacity that is caused by the event in the north. Under this scenario, there would need to be alignment with containerised export activity to maximise the efficiency of international transits.

Details of the scenario

A non-allied powerhouse nation in Asia aggressively asserts its naval presence in the SCS, impacting sea lines of communication and global trade within Australia's immediate region. This could limit access to international ships and shipping lanes, and impact Australia's main trade of commodities that travel via sea within the SCS. The impact of this scenario would directly target the Commercial sector and as such, the Military applications have been set aside within this scenario to best identify a consequence of a larger strategic action on Maritime shipping. This scenario will highlight the potential benefit of using the Strategic Fleet to undertake domestic transits – *no economic modelling has been undertaken for this scenario.*

Australia relies on containerised imports

Over 98% of all container ships that called at Australia ports over 2018-19 were overseas based carriers, representing a reliance on overseas manufacturers and producers. Table 1 illustrates the 2018-19 data¹ with regard to containerised trade, applying a 5-year trend out applied to 2021-2022. Freight originates from Asia via a variety of maritime trade routes including via Japan, China, Singapore, Malaysia, Cambodia and others.²

Table 1 - Number of container carrier ships that called at Australia ports

Year	Container carriers	% from overseas
2018-19	365 (361 from overseas)	98.9%
2020-21*	374 (369 from overseas)	98.6%
2021-22*	383 (378 from overseas)	98.6%

*applying a 5-year trend of 2.4% growth

Containerised imports target the east coast

Table 2 below illustrates the current value of *containerised freight import movements* into Australia. Of a total value of \$239.1B AUD, 65% of that value was delivered to ports in New South Wales and Victoria – primarily Sydney (Port Botany) and Melbourne (Port of Melbourne), respectively. This data is based on the activity of known ships within the international trading fleet and known foreign

¹ <https://www.bitre.gov.au/publications/2021/australian-sea-freight-2018-19> Table 4.9

² <https://datahub.freightaustralia.gov.au/insights/imports-exports/>

countries visited including China, Taiwan, Singapore, Japan, and Malaysia (notably reflecting activity over 2018-19).³

Table 2 - Value of containerised import movements into Australia and % breakdown by state⁴:

State	Value (\$ billion)	% of value
NSW	\$80.1	34%
VIC	\$73.7	31%
QLD	\$44.0	18%
SA	\$9.1	4%
WA	\$29.0	12%
TAS	\$1.5	1.5%
NT	\$1.7	1%

Analyse likelihood, consequences, impact and expected duration

Medium likelihood, high impacts, long duration, major consequences

- **Likelihood:** of international conflict in the SCS over a 20-year period – medium risk
- **Consequence:** Major economic impact

Assumptions (Business as usual (BAU)/disruption)

- **No. of vessels impacted:** Assume a 30% reduction in containerised freight imports.
- **Major cargo types or commodities most impacted:** containerised freight based on the top import movements by value: vehicles, machinery, electrical equipment in addition to include general freight, refrigerated (e.g., produce, frozen goods), food grade (e.g., milk power, grains), CWO B Grade (e.g., scrap, timber), hazardous (e.g., chemicals), tank (wine) and out of gauge (e.g., earthmoving tyres).
- **Duration of impact:** 12 months+ (although disruption due to a weather event would be of a lesser duration, i.e., weeks – months).
- **Doesn't require Naval protection of shipping/convoys:** solely a reduction in international trade, or increased transit time due to taking alternative routes. An average delay of 20% per nautical mile or estimated to be 2.8 days of additional transit time for a 14-day container ship from Singapore to Melbourne.
- **Shipping routes impacted:** maritime trade routes⁵ from Singapore to Australia including constraints to the Malacca Strait between Malaysia and Indonesia, and the east-west passage between the Pacific and Indian Oceans through the South China sea. Assume that the strategic fleet would not undertake international freight movements as out of scope for this scenario.

Based on this assumption of this scenario, an average delay of 15-20% impact to transit time, could reduce annual container movements as outlined in the box below

³ <https://www.bitre.gov.au/publications/2021/australian-sea-freight-2018-19>

⁴ <https://www.bitre.gov.au/publications/2021/australian-sea-freight-2018-19>

⁵ <https://www.maersk.com/local-information/asia-pacific/australia/routes>

Table 2: Scenario impact to transit time

Year	Container carriers – <i>without impact</i>	Container carriers – <i>with impacts</i>
2021-22	383 (378 from overseas)	264 from overseas.

Identify Weak Points in Supply Chain

Shipping routes (sea based)

Singapore is a major transshipment port and a key node in the network that feeds the Australia 'spoke trade'.⁶ The diagram below outlines how trade might need to be adjusted in the event of a crisis in the SCS. Freight could be re-routed through the Sunda Strait if the Malacca is closed. It would not be practicable to reroute shipping through the Torres Strait to the north of Australia due to the hazardous nature of coral reefs and shallow waters.⁷ Given Australia also has compulsory pilotage arrangements in five coastal areas, an increase in shipping may exceed the capacity of currently AMSA licensed pilots and thus increase workforce requirements for new trainees.⁸ As outlined above, Sydney and Melbourne are the core destinations for containerised freight under 'business as usual' circumstances.

Under the scenario, we assume a 15-20% reduction in 'on time, in full' international container imports for key trade routes primarily from Singapore as it is the primary hub/spoke.

Further, under Australia's *Coastal Trading (Revitalising Australian Shipping) Act 2012*, international vessels are unable to load Australian cargo at one port and transport to another Australian port without a temporary license⁹. This provides an opportunity to explore the value of a Strategic Fleet.

Figure 1: South China Sea route diversion¹⁰

To what extent is Australia reliant on international vessels to undertake coastal movements?

⁶ <https://navalinstitute.com.au/wp-content/uploads/Protecting-Australian-Maritime-Trade-Report-March-2020.pdf>

⁷ <https://www.bairdmaritime.com/work-boat-world/maritime-security-world/naval/opinion-southeast-asia-will-take-a-major-economic-hit-if-shipping-is-blocked-in-the-south-china-sea/>

⁸ <https://www.amsa.gov.au/safety-navigation/navigating-coastal-waters/navigation-through-great-barrier-reef-and-torres-strait>

⁹ <https://www.legislation.gov.au/Details/C2021C00432>

¹⁰ <https://www.9news.com.au/world/south-china-sea-conflict-trade-fallout-australia-impact/1bd583ff-7730-4bd9-9086-edac4aa0d2eb>

In 2021, there are 14,702 incidents of ships arriving overseas with further coastal movements in Australia based on the Lloyd's list data. The largest coastal movements of these ships are dominated by bulk carriers stopping at anchorages to pick up mining cargoes from the key mining export ports such as Port Headland anchorages to Port headland (2,939 incidents) and Newcastle Anchorages to Newcastle (1,121 incidents).

Excluding the movements of these bulk carriers, the largest coastal movements are containerships. The major movements under this category include:

- Brisbane to Botany Bay (160 instances)
- Botany Bay to Melbourne (263 instances)
- Melbourne to Botany Bay (200 instances)
- Fremantle to Adelaide (50 instances).

This is followed by vehicle carriers including Brisbane to Port Kembla (116 instances).

- vol total coastal freight
- % carried by international vessels (type)
- % carried by domestic vessels (type)

Freight and logistics efficiency

Under this scenario, there may be additional activity in key ports (i.e., Melbourne and Sydney) given these locations would act as a 'hub' to transfer freight to the Strategic Fleet vessels. We note there may be issues to consider regarding accessibility and productivity bottlenecks in these locations, requiring further investigation. For example, Melbourne and Sydney ports are both mixed container ports and are currently facing challenges associated with international shipping and logistics in a 'business-as-usual' situation.¹¹ However, the scenario may also present an opportunity for the Strategic Fleet to help manage those logistics inefficiencies. For example, the Strategic Fleet may create an opportunity to better coordinate the movement of freight to maximise the efficiency of containerised carriage on international transits. Note, this would require further analysis of 'business as usual' coastal movements and containerised export activity across key ports.

Potential Impact of the Strategic Fleet

Strategic & Military Benefits

Even in the event of compromised SCS trade routes, trade may still be able to transit between Australia and South-East Asia without diverting around the south of Australia. The route would entail sailing up the East Coast and up past the Solomon Islands. The Torres Strait is not a viable alternative route to the Malacca straight due to coral reefs and its very shallow depth, making it unnavigable by large vessels¹², apart from the notable exceptions of:

- Vessels of small enough DWT, which may still be able to navigate the Torres Strait, and
- Bulk carriers and tankers of 12.5m draught and below, using AMSA's Under Keel Clearance Management (UKCM) system.

In the event of a war-like crisis, it may be possible for an international-flagged vessel to divert, for political reasons, from supporting the ADF and other Australian-flagged commercial vessels in nation-

¹¹ https://www.infrastructureaustralia.gov.au/sites/default/files/2020-09/audit_freight.pdf

¹² https://www.nber.org/system/files/working_papers/w28048/w28048.pdf pg. 4 (fn.7)

sustaining activities. If this were to occur, the strategic fleet would offer considerable value filling any resulting gaps. A strategic military fleet would also provide the benefit of an active national fleet present and circulating in Australian waters, and waters of Australian national interest. These benefits are various, but would include:

- Proximity to incidents requiring military or humanitarian attention;
- Provision of a maritime resource to fill any shipping or maritime gaps resulting from short-term political conflicts;
- Proximity to high-density shipping routes around Australia; predominantly coastal shipping, but including significant international shipping routes;¹³
- Additional maritime resources to bolster any activity relevant to localities of strategic national interest; and
- Access to vessels with seafarers experienced in vessel operations, and the context of the SCS and Australian trade routes.

Social: Minimising community disruption

A strategic fleet would provide social benefits in the context of minimising community disruption. The primary benefit would be through the ability to supplement gaps in shipping activity caused by conflict, which would act in the interests of minimal community disruption by reducing shipping-related delays and service disruptions. Other benefits would be smaller-scale, case-by-case instances of activity bolstering feelings of comfort and security throughout the shipping industry, associated industries, and consumers.

Equality: access to goods/services

A strategic fleet would provide access to goods and services that rely on maritime activity that may suffer as a result of conflict in the SCS. The benefits of this may include equality of access and opportunity across Australia, with specific impacts depending on the type of good/service impacted. An example of improved access to goods and services may be high value and high importance medical items with the strategic fleet being able to service this and create equitable access across Australia.

Environmental:

Environmental benefits are fairly unapplicable to this scenario; however, the general environmental benefits of a modern strategic fleet, such as green fuels, would likely apply. Environmental benefits are not discussed in detail.

Financial: commodities imported via the South China Sea to the Australian economy

If regional conflict were to break out, the strategic fleet could contribute to Australia financially by acting to secure maritime trade. While a strategic fleet could not carry Australia's international trade alone, it could help to mitigate some of the financial consequences that would result from interruptions to maritime activity. If this scenario were to be modelled in detail, it would likely identify that the strategic fleet would play a support role but not have major economic or financial benefits due to the large volume of freight compared to the capacity of the fleet size.

In the long-term, the disruption could impact Australia's economic capacity. Disruption to SCS trade routes would be directly detrimental to Australia's GDP, however, the maritime strategic fleet could contribute to minimising the impact by:

¹³ https://www.amsa.gov.au/sites/default/files/styles/website_scaled_image/public/shipping-routes.png?itok=-j2w5qcG

- Providing a maritime resource to fill/supplement any shipping or maritime gaps resulting from short-term political conflicts.
- Remaining in close proximity to high-density shipping routes around Australia; predominantly coastal shipping, but also significant international shipping routes¹⁴.
- Additional maritime resources to bolster any activity relevant to localities of strategic national interest
- Access to vessels with seafarers experienced in vessel operations, and the context of the SCS and Australian trade routes.

Scenario 2: Weather event – targeting/isolated vulnerable communities

Describe the scenario

In this scenario, we consider the impact of a Strategic Fleet to provide critical humanitarian support in the event of a severe (catastrophic) weather/environmental event (i.e., cyclone, tsunami, bushfire) that has damaged critical infrastructure and land-based supply chains, potentially at various coastal locations across Australia, (although cyclones impact coastal areas within the tropical zone).

Weather/environmental events generally isolate targeted geographical areas as opposed to an entire state or territory; however, the impact may be intensified where the crisis zone impacts on a regional centre or service hub that supports other isolated communities. Further, the Pacific Islands where Australia has a geopolitical interest are also susceptible to cyclones and other events (i.e., volcano eruptions).

To understand the economic impact of the Strategic Fleet, we have modelled the impact on GSP in the case of a severe weather/environmental event on a major city (specifically Darwin), explained further below.

Analyse the likelihood, consequences, impact and expected duration

Assumptions

- Given the increasing frequency of extreme weather events, we assess the likelihood of a severe event impacting on land-based supply chains at any location across Australia as **Medium - High** with the impact being **High** from a social and economic perspective.
- Our modelling exercise has considered the GSP impact of a severe (catastrophic) weather event on Darwin which completely isolates the region via land-based routes for one month. While the likelihood of such event occurring in Darwin is assessed as **Low**, the social impact would be **High** and economic impact is also assessed as **High** based on the extensive and extended the loss of critical infrastructure and labour.
- We assume that the event causes disruption to community access to food/medication/equipment supply in certain jurisdictions/communities. Activities of the strategic fleet would

¹⁴ https://www.amsa.gov.au/sites/default/files/styles/website_scaled_image/public/shipping-routes.png?itok=-j2w5qcG

most likely be coordinated with activities of the ADF, either as a second wave of supply or in coordination with other movements (i.e., Air).

- **Loss of line (energy):** There would likely be a major loss of line across various communities.
- **Expected duration:** Depending on the severity of the weather event and the location (including the number of individuals that are impacted), the duration of a humanitarian crisis might extend from days to weeks, with the economic impact contingent on the damage to critical infrastructure and the availability of labour resources. The modelling scenario assumes that Darwin is inaccessible by land (road/rail) for a period of one month and after that, only 50% accessible by land-based supply chain for a further month (roads and rail are likely to be subject to restrictions such as weight and speed restrictions where there is flood and other damage).

Identify Weak Points in Supply Chain

Reliance on land-based supply chains (isolated communities)

The impact of a strategic fleet to provide effective disaster relief would be contingent on access to port and other land and air infrastructure that would facilitate movement of cargo from the vessel and community access to the cargo/supplies.

Land-based supply Chains

Where disaster events occur in isolated coastal areas, the potential of the Strategic Maritime Fleet to support various dispersed communities will depend on the extent of damage to near-by supply channels (i.e., road/bridges) which will be needed to distribute supplies. Otherwise, there may be scope for the Fleet to drop supplies at various coastal points within a crisis zone, however this would require additional time/resources that may reduce the overall effectiveness of the assistance.

If Government were to pursue the humanitarian option, there may need to be coordination and interoperability between the Strategic Fleet and the ADF and potentially aspects of the Fleet incorporated into military planning and exercises on disaster relief.

Location of the fleet

The base location of the Fleet and its staging points become an important consideration under the humanitarian scenario, given the time-pressures to service communities in need. Specifically, the ability to serve isolated communities in northern Australia may require the vessels to always remain within the tropical zone, within quick access of staging base. This scenario requires careful planning to maximise the impact alongside coordination with the ADF to support/supplement activities.

Port Infrastructure

Ports along the northern Australian coastline have varied access to loading/unloading and docking infrastructure, which can limit the ability and effectiveness of any maritime support, if vessels cannot dock and do not have self-discharging cargo capabilities. A summary of major port capabilities is discussed below:

State	Port	Uses	Declared Depth (metres)	Max Vessel Length (metres)	Max Berthing Displacement (tonnes)
NT	Port of Darwin - East Arm Wharf (EAW)	<ul style="list-style-type: none"> Berths 1 and 3 are primarily used for general cargo, containers, motor vehicles and livestock. Berth 2 is used for bulk ore exports and has a rail mounted dry bulk ship loader. Berth 4 is primarily used for bulk liquids and has a dedicated bulk liquids transfer facility. 	B1 - 12 B2 – 12.8 B3 – 13.5 B4 – 11.7	265	
	Port of Darwin – Fort Hill Wharf (FHW)	<ul style="list-style-type: none"> has a natural deep-water berth and includes a passenger terminal with ability to accommodate offshore international passenger processing. Primarily used for cruise and naval vessel visits and small non-cargo carrying vessels. 	East – 9.7 West – 10.7	350	
WA	Port of Dampier – Western Berth	<ul style="list-style-type: none"> 4 berths used for general cargo ships and supply vessels 	10m	340	35,000
	Port of Dampier – Eastern Berth	<ul style="list-style-type: none"> 3 berths suitable for small craft vessels and supply vessels 	7.3 m	340	35,000
	Port Hedland – No.1 and No.2 Berths	<ul style="list-style-type: none"> can berth vessels on either side, is used for bulk, petroleum, livestock, dry bulk containerised cargo and general RO-RO 	13.4 13.5	225 130	40,000
	Port Hedland – No.3 Berth	<ul style="list-style-type: none"> bulk salt, general cargo, containers, livestock and petroleum 	13.6	225	55,000
	Port Hedland – No.4 Berth	<ul style="list-style-type: none"> bulk commodities 	14.7	260	100,000
QLD	Port of Cairns – Wharves No.1-6	<ul style="list-style-type: none"> cruise vessels and visiting Naval vessels and used as overflow for tourist and fishing vessels and other coastal shipping 	8.4	152.4	

State	Port	Uses	Declared Depth (metres)	Max Vessel Length (metres)	Max Berthing Displacement (tonnes)
	Port of Cairns – Wharves No.7-8	<ul style="list-style-type: none"> general cargo, dry bulk, containers and fertiliser berth and can accommodate vessels up to 40,000 tonne dead weight 	9.3	152.4	
	Port of Cairns – Wharves No.10	<ul style="list-style-type: none"> liquid product berth for petroleum products and gas and bunkering 	9.3	152.4	
	Port of Cairns – Wharves No.12	<ul style="list-style-type: none"> owned and operated by Sugar Terminals Limited and includes an outloading sugar conveyer system 	10.5	152.4	
	Port of Townsville	<ul style="list-style-type: none"> 11 berths ranging in petroleum, concentrates/ore, containers, break bulk, livestock, motor vehicles, cement, molasses, fertiliser. 	(design depth) -12 - -14		50,000 (berths 10 and 11) 70,000-90,000 (berths 1-9)
	Port of Gladstone	<ul style="list-style-type: none"> handles over 30 different products, led by coal, LNG and aluminium, in addition to cement, petroleum and timber. 	11.3		
	Port of Bundaberg	<ul style="list-style-type: none"> used for out shipping raw sugar, other goods related to that industry such as Bundaberg Rum and molasses 	10.5		

Multipurpose vessels

Multipurpose vessels (MPV) could be utilised to service ports/locations where there is nil or limited access to port infrastructure and to support specific vessels (i.e., roll-on-roll-off (RoRo)). Moreover, if equipped with ship cranes to load/unload cargo onto wharves or barges, and with shallow drafts, these vessels would be better able to access isolated/vulnerable communities – especially if port infrastructure is damaged.

Darwin

Darwin represents 60% of the NT population with the remaining population being dispersed throughout remote and isolated areas. The city relies on land and rail access to provide critical domestic supplies (i.e., food and subsistence)¹⁵ and these distribution channels also supply isolated townships and communities.¹⁶

The inaccessibility of Darwin may impact on the capacity to service isolated communities via land-based supply routes, thereby increasing costs and reducing the frequency of services. For example, communities in Arnhem Land (i.e., Gove) rely on food supplies via barging and air from Darwin. Similarly, there may be challenges securing maintenance services and fuel supply to trucks transiting the Stewart Highway that would rely on regional towns (i.e., Katherine, Tennant Creek) as service points. These logistical challenges may also apply to communities along the north-west of Australia and north of Cairns (i.e., Cooktown and surrounds) in the case of a weather event.

Figure 2 shows a National Highway connecting Darwin, Katherine and Alice Springs, with a wester connection (Victoria Highway), a western connection (Barkly Highway) and various arterials. Ultimately, loss of access to Darwin would further complicate the ability to supply these townships.

In the event of a severe and extended catastrophe, Darwin could be used as a staging point to distribute food and other critical items that could be onforwarded to regional and isolated communities via other modes of transport (i.e., air) in coordination with the ADF. Access to the ADF base Tindall at Katherine may facilitate this approach.

Source¹⁷



¹⁵ https://dipl.nt.gov.au/__data/assets/pdf_file/0012/887790/TerritoryWideLogistics_MPlan_WEB-1.pdf

¹⁶ TerritoryWideLogistics_MPlan_WEB-1.pdf (nt.gov.au)

¹⁷ https://dipl.nt.gov.au/__data/assets/pdf_file/0012/887790/TerritoryWideLogistics_MPlan_WEB-1.pdf

Potential Impact of the Strategic Fleet

Social Impacts

Scenario 2 involves the strategic fleet delivering critical needs to a community (food, shelter, medicine etc), hence the benefit is primarily social - notably by saving lives and increasing community safety. If the crisis were to extend in duration beyond days, meaning nil or restricted access by land, then the strategic fleet has increasing value, particularly by servicing a large community or centre and where air infrastructure may be damaged. The Fleet may also form a point of evacuation for citizens.

Strategic Geopolitical Impacts

Multipurpose vessels could also service Pacific Island communities that are impacted by weather/environment events similar to Tropical Cyclone Harold in 2020 and the 2022 Tongan volcanic eruptions. Whilst RAAF assets provided support in the aftermath of Harold (8 ADF flights delivering 224 tonnes of humanitarian relief),¹⁸ there may be further value in delivering sea-based support under a scenario where air access is limited (i.e., due to airport damage), or other damage that limits land-based access to communities, also for large-scale evacuations. Further, there may be additional value in providing ongoing support to Pacific Island communities until any port damage can be repaired. For example, in the aftermath of the Tongan Volcano eruption, assessments pointed to the likelihood that moorings would be inundated and damaged, where it is likely that some ports could have some surface flooding, contents loss, minor damage and components loss.¹⁹ To note, it is also likely that the volume of support may be in excess of current defence vessel capacity and this potential constraint should be factored into strategic fleet planning. Any activities would need to be coordinated with the ADF and other agencies to provide the necessary service and strategic support to the Fleet. However, there is scope for the assets to be incorporated into Australia bilateral planning and aid activities to support the Pacific.

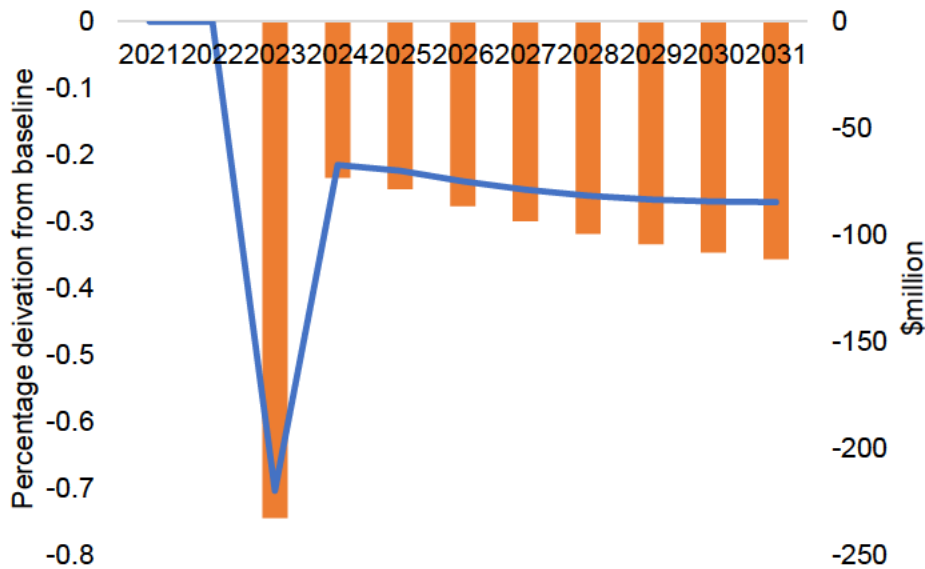
Economic impacts Model Analysis – Darwin

In this scenario, we assume that a major catastrophic weather event has occurred to leave Darwin completely cut off from land-based supply chains (road/rail). We assume no inland access to NT for a month and 50 per cent access for the following month in 2023. The emergency repair work would allow full inland access in the third month. This could reduce the required investment by 12.5 per cent (annualised) of the baseline investment.

How does the less investment for post-disaster recovery affect the NT economy?

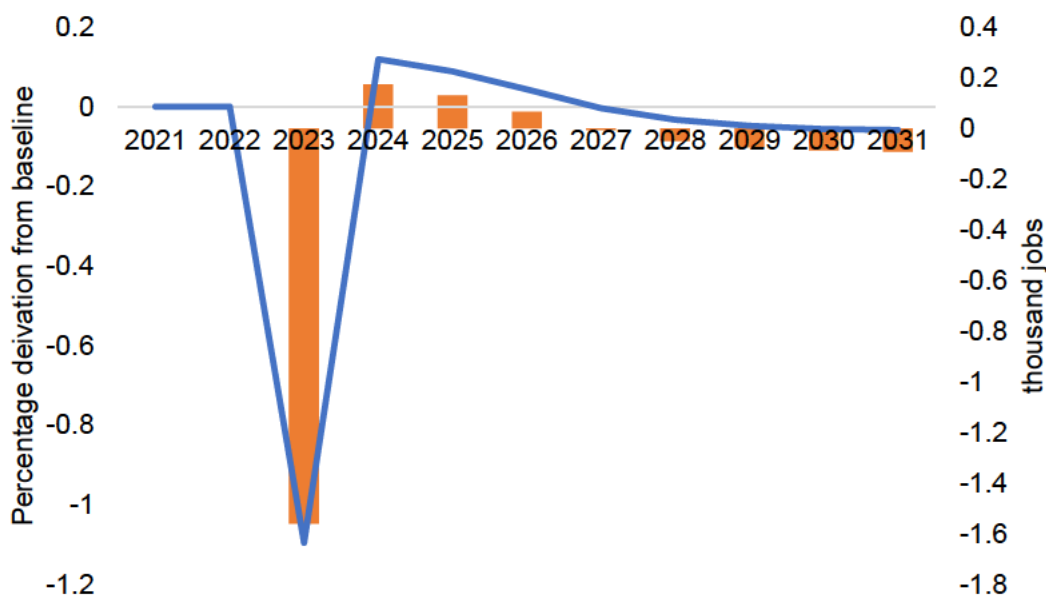
The lower than required investment for post-disaster recovery due to the disruption to the supply of capital goods is estimated to reduce NT's GSP by 0.7 per cent or \$232 million. There will be aftermaths of such a disruption due to significant less investment made in 2023, leading to capital stock remaining lower for the years going forward. The total effects of this disruption event accumulate to \$1 billion loss in NT GSP over a 9-year horizon.

¹⁸ <https://www.dfat.gov.au/crisis-hub/tropical-cyclone-harold>

Figure 3 **GSP loss** in NT: line LHS, bars RHS

Source: PwC modelling

On the employment front, employment is estimated to decrease by 1.1 percentage point (or 1,560 job losses) in NT in 2023. Employment in the forward years bounces back a bit, slightly above the baseline, as it takes time for wages to return to the baseline level.

Figure 4 **Employment loss** in NT: line LHS, bars RHS

Source: PwC modelling

In some unlikely circumstances, the inland access to Darwin could be cut-off for an extended period. This could cause more significant damage to the NT economy in both the short and the long term.

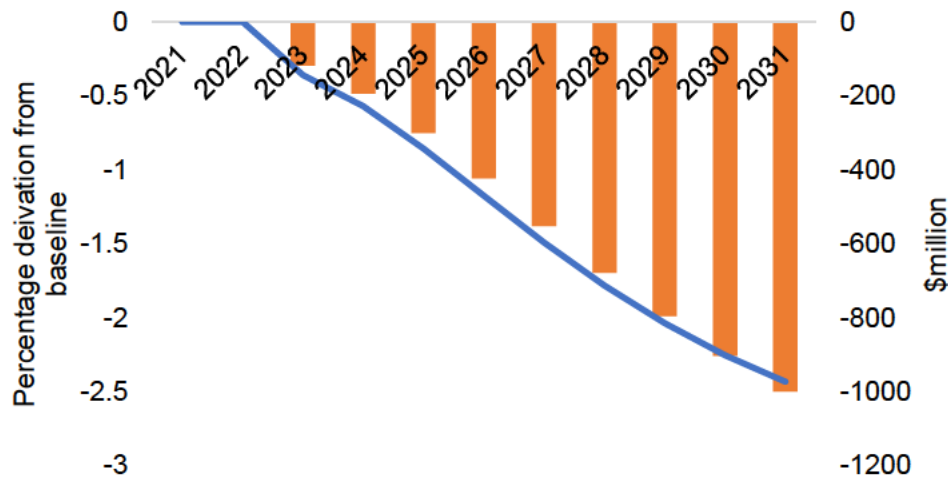
How does the population loss affect the NT economy?

The loss in population in NT as a result of disruption to the supply of essential goods during natural disasters is estimated to have larger impacts in the outer years. This is because with less forward investment due to lower capital return (as a result of the loss in population), the capital stock in NT will keep declining in the medium-term.

Specifically, NT GSP is estimated to decline by 0.35 per cent (or \$120 million) in 2023 and the decline reaches 2.5 per cent (or \$1 billion) in 2031, relative to the baseline. This implies an accumulated GSP loss of \$5 billion over a 9-year horizon. The existence of the strategic fleet may provide support to communities about their relative safety and security in the event of a natural disaster.

Figure 5 **GSP loss** in NT: line LHS, bars RHS

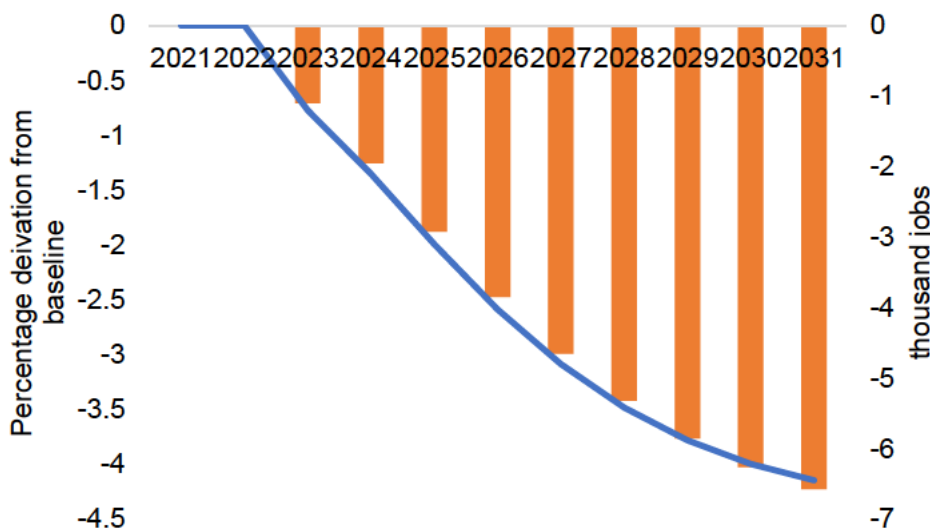
In 2020, bushfires closed road networks, preventing evacuations and the movement of emergency goods. Bass Strait supply vessels, Far Saracen and Far Senator helped to provide equipment and personnel to support emergency services in responding to the East Gippsland bushfires, concentrating in the town of Mallacoota. A similar utilisation of commercial ships could be used to deliver critical supplies to negatively affected areas following an adverse weather event.



Source: PwC modelling

NT's employment is estimated to decline by 0.8 per cent (or 1,100 jobs) in 2023 and the decline reaches 4.1 per cent (or 6,500 jobs) in 2031, relative to the baseline. This is consistent with the pattern in the GSP loss.

Figure 6 **Employment loss** in NT: line LHS, bars RHS



Source: PwC modelling

Conclusion

Based on the above analysis, there may be value in the Fleet providing critical humanitarian support to communities in the event of a severe (catastrophic) weather event where there is limit or nil access to the area via land. The intensity of the benefit would be contingent on the:

- Suitability of vessels to service various coastal locations, noting that MPVs could support landing at virtually any coastal port, whereas other vessels (i.e., Ro-Ro) are limited to locations with appropriate infrastructure and access.
- Length of time for the Fleet to reach the crisis point, noting that scenario planning would be required to service isolated communities such as Darwin, via appropriate staging points and noting the “stand-by” location of the vessels. To maximise value, the fleet could operate in coordination with the ADF, which would provide first round support.
- Extent of the damage to land-based supply routes, noting that severe damage to road or rail may isolate major towns or communities for a significant period (i.e., weeks/months). Under this scenario, the Fleet could form a temporary staging point to service isolated communities that otherwise rely on the impacted town/city for critical supplies. There may be a significant economic benefit delivered if the Fleet activity also prevented the loss of economic activity, or facilitated recommencement of economic activity in the crisis zone.

By utilising a ‘Coastal Trading Highway’, regional locations that are inaccessible or highly expensive to access by land, can maintain a supply of food, medical supplies and other necessary equipment via the Strategic Maritime Fleet. The implications of acquiring MPVs for a strategic fleet would allow them to operate commercially transporting heavy lift/project cargo such as the transport of wind turbines.

Scenario 3: Disruption to Fuel Supply

Describe the scenario

Details of the scenario

Western Australia has a low global average for days of diesel reserve and is at risk of shortages during supply disruptions, which is likely to impact key industries

Western Australia’s (WA) Kwinana refinery previously had the capacity to meet close to 80% of the state’s demand for diesel; however, the shutdown of the 65-year-old refinery in March 2021 has increased the state’s reliance on imports to 100%.²⁰ In addition, under the International Energy Agency (IEA), Australia is required to hold 90 net import days of fuel and it is not currently meeting this target, posing a significant threat to the country’s key industries including mining, which only has 22 days of reserve coverage for diesel stocks.²¹ On the other hand, at any point in time, there are close to 45 oiler tankers in transit to Australian ports, with enough crude oil to keep refineries going for only 12 days.²²

In this scenario there is a disruption to the import of diesel fuel nationwide. In WA, access to diesel fuel is decreased by 50% due to conflict in the SCS, and the key mining industries in WA can only operate at 50% capacity as a result, with the crisis lasting one year in 2023. This scenario has been

²⁰ <https://www.afr.com/companies/energy/farmers-fear-for-fuel-security-as-bp-turns-to-imports-20201102-p56amz>

²¹ <https://www.energy.gov.au/sites/default/files/liquid-fuel-security-review-interim-report.pdf> pg.30

²² Ibid.

selected as diesel is a significant energy source for the mining industry, it is the only fuel used by trucks and is vulnerable given the above-mentioned below benchmark days of reserve.²³

WA relies on diesel fuel imports and a significant portion of this comes from countries in Asia

For current supply activity, diesel imports to Australia for September 2022 comprised of 38% from South Korea, 14% from Malaysia, 13% from Japan, 11% from Taiwan, 9% from Singapore as well as Brunei, and 6% from China respectively.²⁴ Australia is therefore heavily reliant on diesel fuel imports from countries in Asia.

Analyse likelihood, consequences, impact and expected duration

Low likelihood, medium impact, and short duration

- **Likelihood:** medium.
- **Consequence:** major.
- **Impact:** medium
- **Expected duration:** 6-12 months

Assumptions (BAU/disruption)

- **Volume impact:** assume a decrease by 50% in WA, and the key mining industries operate at 50% capacity. Assume impact to fuel import terminals
- **Shipping routes impacted:** West based shipping routes north and south from port of origin.
- **Sea freight not impacted:** all other states and territories.
- Assume the current level of coastal activity in Western Australia of around 10 million tonnes loaded, and 3 million tonnes discharged remains unchanged.²⁵

Identify Weak Points in Supply Chain

Challenges with the refinery market and alternative re-supply options

Western Australia is not immune to market vulnerabilities during times of uncertainty

Australia has a high reliance on petroleum from Asia as the highest level of imports come from countries in this region. The current supply chain model has driven a commercial imperative to operate on a 'just-in-time' model, with limited reserve stocks.²⁶ In scenarios where tightened capacity may be apparent in the refinery market because of SCS uncertainty, Australia may be subject to commercial competition and increased cost. To this end, Australia would be subject to a premium if it required faster refined oil supply with Asian based refineries at capacity. This is a challenge as Australia holds minimal leverage over oil refining nations when compared with other larger nations in the market and may be placed at the end of priorities for refinement. Within Australia, domestic oil refinery can be

²³

https://www.energy.gov.au/sites/default/files/analyses_of_diesel_use_for_mine_haul_and_transport_operations.pdf

²⁴ Ibid.

²⁵ <https://www.bitre.gov.au/sites/default/files/documents/asf-2018-19.pdf> pg.21

²⁶ <https://www.energy.gov.au/sites/default/files/liquid-fuel-security-review-interim-report.pdf> pg.5

prioritised over export. This same logic applies to the Asian based Oil refineries, leaving Australian provisioned Oil without production capability.

Although most of Australia's refined petroleum is sourced from Asian trading partners, it is also important to note that over 40% of liquid fuel sold in Australia is also derived from crude oil produced in the Middle East. If a regional conflict in the SCS closed trade routes, and reduced supply from countries in Asia, alternative supplies from India, the Middle East, Europe or the US could also take up to five weeks to arrive in Australia.²⁷ This makes the fuel supply chain further vulnerable during times of conflict.

Fuel relocation

A reduced diesel import scenario may enact the Liquid Fuel Emergency Act 1984 creating an opportunity for the Strategic Fleet to transport critical fuel to maritime ports throughout Australia

If Australia was unable to receive imports the Australian Government could enact the *Liquid Fuel Emergency Act 1984 (LFE) Act* to reallocate fuel to critical uses throughout the country.²⁸ Under this circumstance, consumer rationing may have to be enacted and industries would be prioritised based on the order of national significance. This enactment would create an opportunity for the Strategic Maritime Fleet to transport fuel throughout Australia and undertake key coastal activity.

Potential Impact of the Strategic Fleet

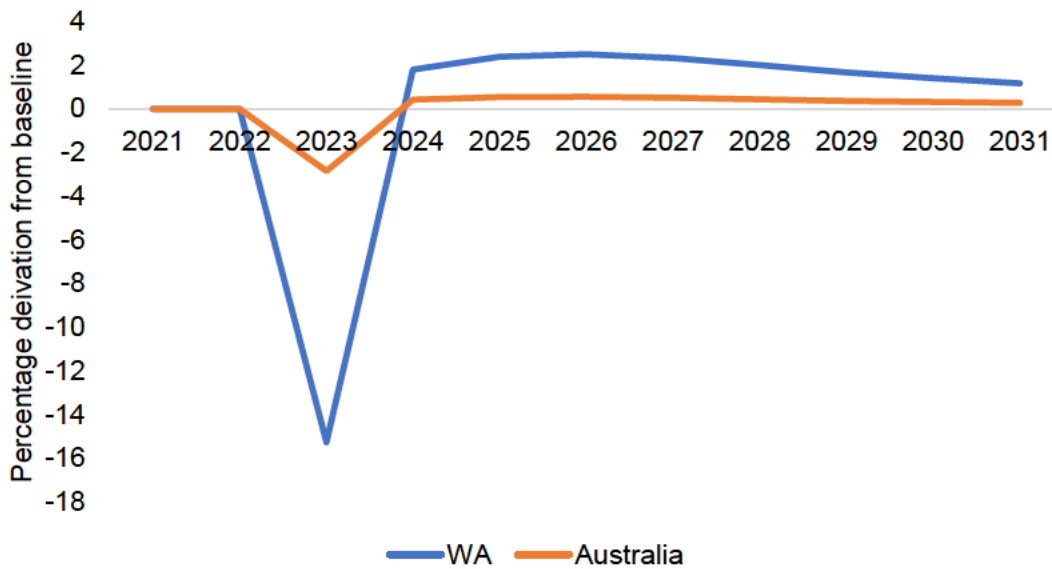
Financial, Social and Other Benefits

How does this scenario impact the WA economy and the national economy?

WA's Gross State Products (GSP) is estimated to lose 15 per cent (or \$49 billion) compared with the baseline in 2023. The Australian Gross Domestic Product (GDP) is estimated to lose 2.8 per cent (or \$57 billion) compared with the baseline in 2023. WA GSP and the Australian GDP will rebound after the mining industry recovers from the disruption, driven by increased investment.

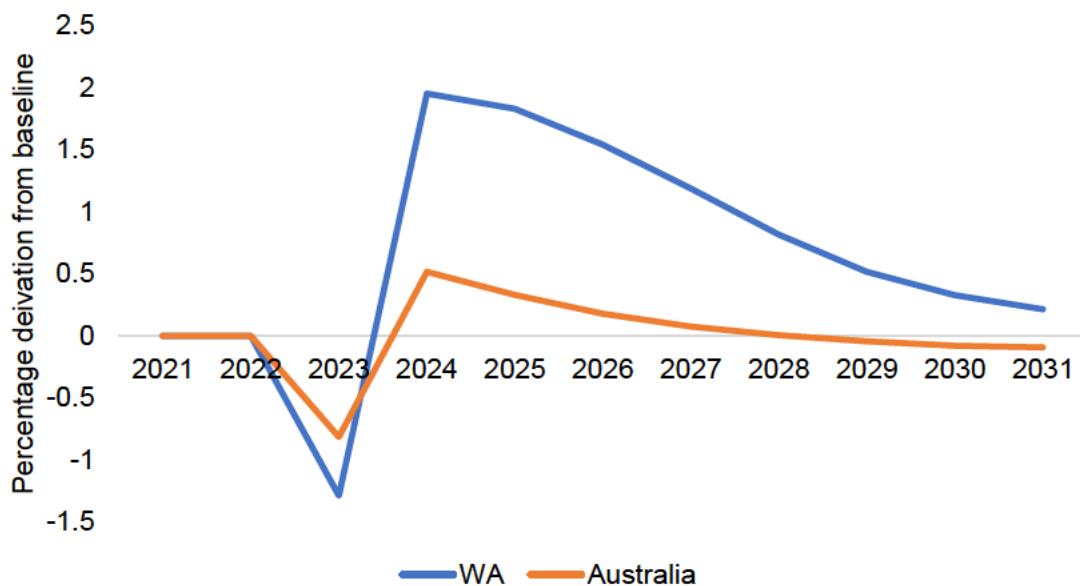
²⁷ <https://www.energy.gov.au/sites/default/files/liquid-fuel-security-review-interim-report.pdf> pg.47

²⁸ <https://www.energy.gov.au/sites/default/files/liquid-fuel-security-review-interim-report.pdf> pg.43

Figure 7 **GSP/GDP loss in percentage**

Source: PwC modelling

On the employment front, employment is estimated to decrease by 1.3 percentage point (or 19,100 job losses) in WA or decrease by 0.8 per centage point (or 62,000 job losses) nationwide. Employment in the forward years bounces back a bit, slightly above the baseline, as it takes time for wages to return back to the baseline level.

Figure X **Employment loss in percentage**

Source: PwC modelling

Strategic & Military Benefits

- Australia's fuel security is maintained by ensuring Australian sovereignty over the shipping transportation aspects of international importation, and domestic distribution, of Refined Petroleum Products (RPP) - specifically diesel.

Social: Minimising community disruption

- As Australia imports 90% of crude oil, refined petroleum and diesel, fuel can be transported from major ports to affected areas via the use of a coastal domestic fleet.
- Coastal regional locations that are inaccessible or highly expensive to access by road/rail can potentially maintain a secure supply of fuel via the Strategic Fleet, meaning economic fallout is limited.
- Protecting against rising fuel disruptions would not only limit the cost of diesel, but also against a substantial increase in the cost of a range of goods, likewise preventing inflationary pressure and subsequent interest rate rises.

Environmental (if applicable): Could the fleet help with clean up post a disaster?

- Emissions are considerably lower; it would take over 1,000 truck movements to shift the diesel volume carried by one MR tanker.

Financial: i.e., benefits of commodities imported via the South China Sea to the Australian economy.

- Compared to other developed countries (for example in North America and Europe), Australia does not have a network of pipelines that can also move diesel petroleum around the country. Maintaining the maritime supply chain plays a key role in linking population centres.
- Short term disruptions to the supply chain could be of limited impact in the wider Australian market.

Disbenefits

- Limited supply of diesel fuel would increase the variable cost of shipping, making it highly expensive and consumer demand would likely decrease.
- Frequent deliveries are required if fuel storage is limited (which is not possible with a small fleet). As such, fuel tankers would need to be appropriate for the scenario (i.e., crude vs refined) and likewise regional remote ports may not be able to accommodate large vessels, putting pressure on the government to source a multitude of smaller vessels to meet demand.
 - Large number of vessels – 750-1000 foreign vessels/year (2-3 deliveries/day) required to support Australia's fuel. A strategic national fleet unlikely to supplement shipping needs
- Refined petroleum products, including diesel, cannot be carried in a crude oil tanker, but rather require coated tanks, and need to be carried in a product tanker. (However, it should be noted that a product tanker could plausibly carry crude oil). Since Australia only has 4 oil refineries²⁹, which are both relatively small and aging, any disruption to fuel supply would need to import refined petroleum products over crude oil.
- A regional shortage of petroleum products would, although not directly affect all participants in supply terms, nevertheless expose all industries to the price impact.

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https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/FlagPost/2020/December/Oil_refineries_and_fuel_security#:~:text=Table%201%3A%C2%A0Australian%20fuel%20refineries%2C%20December%202020

Potential mitigations that a strategic fleet might require

Infrastructure investment

Investment in infrastructure to support access to ports for loading and unloading

Financial support

- Australian Government could use financial instruments to underpin freight capacity to be drawn in times of crisis.
- Government could underwrite options contracts with shipping companies or cargo owners to 'buy out' their capacity during a national crisis, helping to bolster the fleet's impact.
 - Approvals and appropriations for the funds required for strategic fleet support.

Governance and oversight

- Governance and oversight bodies for fleet management and decision-making powers
- Staffing for the governance and oversight body, for instance
 - Clerical support for Seafarers with dedicated HR staff and includes roster clerks, workforce planners, Legal officer.
 - Shipping coordinator required to plan shipping requirements and vessel movements. Required to have Maritime background in a reducing staffing level.
- Purchasing officer for acquisition of Vessels
- Financial structures surrounding fleet management
- Fiscal incentives and regime for the Fleet (debt guarantees, taxation etc)
 - For example, the UK introduced a tonnage tax scheme for ships in 2000, incentivising ships to register under the UK flag. Tonnage tax companies are required to elect to opt-in to the regime for a 10-year period and may extend that election on a rolling annual basis. The Tonnage Tax would work on a fixed notional profit, based on the net tonnage of privately owned ships, instead of actual annual profits from shipping activities.
- Flagging requirements and conditions
- Governance and documentation of workplace Enterprise agreements.
 - Vessels can be contracted out to a Private shipping company on the agreed structure of availability set by Australian Government. This matches current utilisation of Royal Fleet Auxiliary (RFA) use of RORO vessels when required but contracted out

Legal and Commercial risks

There are a variety of legal and commercial risks that the Department will need to consider if it opts to implement and use a Strategic Fleet to support the Australian shipping industry. This is particularly the case if these vessels are already currently in use for commercial services at the time that the Commonwealth needs to requisition the vessels.

The specific legal and commercial risks that arise will depend on the nature of the circumstances which require the Strategic Fleet, and accordingly, will need to be assessed on a case-by-case basis. However, the key identified legal risks and questions that should be addressed across all scenarios include:

- **Power to requisition/use vessels** - Before the Commonwealth is able to activate the strategic fleet, the Commonwealth will need to assess whether it has met the necessary regulatory requirements to requisition vessels or activate the strategic fleet. We expect that any power to requisition or activate the strategic fleet will be limited to specific scenarios (e.g. military conflict, national emergency etc), so there is a threshold question as to whether those circumstances have arisen in the first place.
- **Legal consequences to commercial operators of using requisitioning power** – If the Commonwealth requisitions or activates the strategic fleet, it will need to consider any legal and commercial consequences on the commercial operations (if any) of the fleet. Key questions to be dealt with include:
 - If the relevant vessels are currently transporting goods intrastate for a commercial purpose, what is to become of the goods being transported? Will the vessels complete their current voyage, or will they be required to drop off any containers at the next port?
 - Will the vessels be required to cancel any planned future voyages?
 - Will there be compensation payable to either the strategic fleet vessel operator or a customer of the strategic fleet vessel for a voyage not being completed?
 - What is the scope of any compensation payable by the Commonwealth? For example, will compensation be limited to losses arising directly from the use of the fleet, or will losses include indirect or consequential losses?
 - If compensation is payable, what is the method and structure of any compensation payable? For example, what are the evidentiary requirements for a commercial operator or other entity seeking compensation, and which entity is responsible for paying the compensation (e.g. Will the Commonwealth pay the commercial operator and any other affected entity directly, or will the Commonwealth pay all compensation directly to the commercial operator who will then be responsible for paying any other affected entity).
- **Legal consequences associated with supported industry of using requisitioning power** – The Commonwealth will need to consider any legal risks associated with it implementing the fleet on the affected industry. For example, if the Commonwealth uses the power to activate the strategic fleet and takes over particular operations, what are the legal and commercial consequences for any vessels that were originally planned for use in the relevant voyages or transport operations? In such circumstances, those other entities may attempt to argue that any breach of their own contract was caused by the Commonwealth's decision to activate the strategic fleet and seek compensation or damages.
- **Licensing of vessels** – There are a variety of licences available to commercial shipping operators within Australia. If the Commonwealth seeks to activate the strategic fleet, it will need to ensure that the licences granted and held by strategic fleet vessels are sufficient for the purpose for which the strategic fleet is activated. There is also a threshold question as to whether the strategic fleet vessels will be able or required to hold multiple licences, or whether a 'strategic fleet licence' will be granted to the vessels which permit both commercial activities and strategic fleet activities.
- **Industrial relations issues of using requisitioning power** – There are a variety of industrial relations questions that will need to be answered in relation to the use of the strategic fleet. Key questions to be dealt with include:
 - Will seafarers of the requisitioned ship be required to remain available for the activities of the strategic fleet? If yes, what does this mean if the seafarer was meant to cease working (e.g. due to leave) during the period that the strategic fleet will be used by the

Commonwealth. If no, who will bear responsibility for ensuring there are seafarers during strategic fleet operations (is it the Commonwealth or the vessel owner/operator)?

- Will any of entities in the supported industry (for which the Commonwealth is taking over activities) have to retrench staff? Will the Commonwealth pay compensation to those entities?
- Are there any additional industrial relations requirements on strategic fleet vessel operators (i.e. over and above any standard industry requirements in relevant awards etc.)?
- **Funding during strategic fleet operations** – The Commonwealth will need to consider how it will fund the strategic fleet on an operational basis. Will the Commonwealth operate/fund the fleet during the times that relevant vessels are used for strategic fleet purposes? Will the Commonwealth pay a commercial rate of return to the owner/operator of the strategic fleet vessels while they are being used for strategic fleet purposes?

Areas of future growth for Australian Industry

Training

The renewed focus on shipping and associated investments in training, capacity and infrastructure provides opportunities to explore where Australian industry can contribute thereby building scope to extend the GDP and employment impacts of the Fleet. Areas to explore include:

Investment in training facilities

Research suggests that the cost of training is the primary disincentive to increase the uptake of maritime and sea-based training among Australian industry, and in most cases, the training costs are borne by the employer. Furthermore, once qualified, the value of recruits on the global marketplace increases, being a further disincentive for employers to invest in their staff. Given the strategic benefits of trained seafarers, there is an opportunity to explore where the Strategic Fleet could take a leadership role in the training Australian crews. Options to increase capacity for maritime training include improved collaboration between key stakeholders, harnessing alternative means of training, recognition of prior learning, and innovative management of vessels providing sea time could be combined to reduce the current backlog of seafarers unable to obtain approved certificates of competence due to a lack of mandatory sea time.³⁰

To build maritime training capacity, the UK Government is prioritising mapping of careers paths in training courses and enabling a proactive approach to career planning, while noting that technologies such as AI and virtual and augmented reality may potentially change the way training has been undertaken. The Government has committed to developing cutting edge seafarer training and to develop a Maritime Skills Commissions involving industry and government to ensure maritime training incorporates the latest industry requirements. This also reflects the role of emerging technologies in the maritime sector (autonomous systems, battery technology and alternative fuels).

There is an opportunity to leverage Australian industry capabilities in these areas to work with government, training institutions and industry to between coordinate, plan and design and deliver training for the Australian workforce and ensuring that for some roles, there are opportunities for cross-industry diversification. This would also enable specialists from other industries (i.e., mining, energy) to seek employment in the maritime sector including in land-based roles.

³⁰ https://www.researchgate.net/publication/272121004_Management_of_berths_at_sea_for_seafarer_students

Strategic Maritime Fleet Report: Interim Options To Support a Strategic Fleet

Paper E

DITRDC

December 2022

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Interim Fleet Composition:

5 General Cargo, 5 Bulk Carriers, 2 Ro-Ro

Option 1: Full Ownership Model

Description of Option:

As outlined in the terms of reference, by establishing a strategic fleet of Australian owned and crewed vessels that operate on a commercial basis, these ships could then be requisitioned by the Government in times of national crisis.¹

These ships would ideally be privately owned but considering the composition of state-owned companies such as TasPorts and that their subsidiary Bass Island Line already service isolated coastal communities, they could be owned by government in the interim.

Establishment Requirements

Immediate Route Planning:

- East Coast Brisbane to Melbourne, via Sydney alleviating Inland rail cargo route expected increases. Vessels would transport of goods along the East Coast to reduce impact of land movements of international cargo
- East to West coast corridor – Main route for domestic containerised cargo within Australia. Estimated to be 70-90% of containerised cargo is currently moved by rail.
- Bass Strait is currently served by ro-ro vessels and only Australian flagged vessels operate under a General Licence on this route.
- Australia to Pacific Islands. Provides dedicated vessel with regular roster of movement to provide goods and services between Australia and Pacific region.
- Australia to Japan. 3rd largest trading partner in the region and 2nd largest export destination. Provide tax incentives to charter company on regular route.
- Perth to Christmas and Cocos (Keeling) Islands. Current shipping is utilised during the Dry season (March to Sept) when sea states allow vessels to berth at Flying Fish Cove (CI) and anchor off Cocos Island for barge movements.

Immediate Workforce Needs

- Would need to provide for ongoing workforce overhead required, as opposed to charter where workforce costs are subsumed into a consolidated fee on an 'as needed' basis for the duration of the charter.
- Would be more strictly subject to Australian industrial relations regime

¹ https://www.infrastructure.gov.au/sites/default/files/documents/final-terms-of-reference-strategic-fleet-taskforce_0.docx

- Larger Administrative support structure for Fleet Management including Systems Program Office (SPO) to manage Maintenance, utilisation and adherence to ongoing updates to Maritime law.
- Engineering staff to make assessments of any vessels to be purchased and ensure vessel is in seaworthy condition

Cost Estimates:

Core Fixed Costs –

Core fixed cost	Vessel	Cost (All costs are listed as USD)	Assumption:
Purchase Cost:	Medium / Large Cargo Vessels	The cost of a second-hand 4000-5999 TEU is \$18.5m	This figure is informed by desktop research of recent sales. The vessel size was determined through vessel container vessel calls by capacity at Australian ports.
	Aframax vessel	The purchase cost of a 10-year-old second-hand Aframax vessel is \$39m	This figure is informed by desktop research of recent sales. Aframax is used for the majority of Australia's crude imports and exports.
	210m Ro-Ro	The purchase cost of a 210m Ro-Ro is \$80m	This figure is informed by desktop research of recent sales. The vessel size was determined by management considerations.
Manning budget	Medium / Large Cargo Vessels	The manning budget, inclusive of crew wages, victualling, crew travel, miscellaneous costs and COVID-19 was \$1.08m	This figure is sourced from the Drewry Manning Annual Review forecast 2022
	Aframax vessel	The manning budget, inclusive of crew wages, victualling, crew travel, miscellaneous costs and COVID-19 was \$1.625m	This figure is sourced from the Drewry Manning Annual Review forecast 2022
	210m Ro-Ro	The manning budget, inclusive of crew wages, victualling, crew travel, miscellaneous costs and COVID-19 was \$1.187m	This figure is sourced from the Drewry Manning Annual Review forecast 2022
Registration	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	The total registration fees inclusive of ships required to be registered, the application for Continuous Synopsis Record, safe manning determination and net tonnage fees for each of these vehicles is \$41,507	This figure is informed by registration costs and charges in the Australian Maritime Safety Authority

Core Variables

Core fixed cost	Vessel	Cost (All costs are listed as \$USD)	Assumption:
Bunker Rate	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	The 1 year VLSFO Bunker price (max 0.5% sulphur) average for APAC \$850	This figure was determined through desktop research. VLSFO (max 0.5% sulphur) was used as the minimum standard in Australia.
Port fees	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	<p>The average port fee (incorporating ship-based and cargo-based charges for major ports is approximately \$114 per TEU.</p> <p>The average port fee for fee (incorporating ship-based and cargo-based charges) for smaller ports is approximately \$94 per TEU.</p>	<p>This figure is sourced from the Australia Productivity Commission's report 'Lifting productivity at Australia's container ports' 2022.</p> <p>This figure is sourced through desktop research a selection of fees and charges reports from smaller ports in Australia from 2022.</p>

Benefits:

- Offers the best degree of sovereign control in the event of vessel diversion or requisitions. This includes vessel safety management, environmental controls, taxation and cooperation in the event of a national directive (i.e., defence or disaster)
- Greatest enhancement opportunity for maritime expertise and workforce development, with continuously employed Australian sailors, helping to support and maintain a skilled maritime workforce, providing core infrastructure and commercial opportunities for industry.
- Delivery of critical commodities is maintained, ensuring an uninterrupted flow of critical supply chain inputs across health, energy, resources and agricultural sectors.
- Owned vessels would be better placed support sovereign advanced maritime technology technologies such as autonomous vessels and remotely operated surveillance (Existing Industry Interaction with Defence and Opportunities for Cooperation – Paper A)
- New vessel capabilities – additional fuel capacity or alternative bunkering arrangements; enhanced cyber protection etc.
- Able to be leased to Allied Navies and Governments within the Southeast Asia and Pacific Region to support their peacekeeping or Humanitarian aid

Risks:

- Extremely cost prohibitive to establish as an interim option, though could form part of a hybrid final option. If the Australian government decided to sell the interim assets, this could occur at a significant loss - especially if market volatility persists. . Leasing is less flexible than chartering, due to fixed terms and length of commitments.
- Choice of flag is an essential competitive factor and Australia fares poorly on costs compared to more commercially appealing flagged nations on the open registry
- Australian crewed and flagged vessels face a significant labour cost disadvantage, in a highly competitive market. This puts pressure on profitability over time and reduces capacity to invest in more productive ships and technologies (as shipping rates are set externally).
- Would need to provide for ongoing workforce overhead required, as opposed to charter where workforce costs are subsumed into a consolidated fee on an as needed basis for the duration of the charter.
- Could discourage carriers from entering the Australian shipping market, and may encourage rent-seeking behaviour (such as protection from competition or pressure to provide ongoing financial support)²
- Unlikely to protect from all forms of risk or lead to self-sufficiency across all forms of shipping/container needs.
- As an alternative to outright ownership, the taskforce should not the potential pitfalls of a subsidisation and loan guarantees – the former of which was the system in Switzerland where the credit facilities would afford ship owners preferential interest rates in exchange for rights to re-deploy their ships in times of national need³ However, this was a politically sensitive issue, was disbanded and was subject to significant fraudulent activity.⁴
 - o The Swiss model had significantly stringent conditions where the shipowner must be Swiss, 51% of the ship company's shareholders must be a resident in Switzerland; companies do not have the right to sell a ship within three years of acquiring⁵
 - o Model is similar in its underlying requirement that the fleet must ensure the supply of critical resources for the host country in times of war, humanitarian crisis, or environmental disaster.
- In the event of a crises, the time to access ports by the strategic maritime fleet may be too long, especially if they commercially operate in Tasmania or Western Australia.
- Vessels engaged commercially interstate or overseas may not be able to arrive in time to assist.
- Port infrastructure may be too severely damaged to enable the unloading of cargo, especially when considering conventional cargo vessels heavily rely on port infrastructure.
- Much of the strategic fleet's shipping contracts would have to be broken, which the government may need to buy out from companies. If the government chose to utilise charter ships as a short-term option, then they would still need to underwrite options contracts with shipping companies to 'buy out' capacity in times of need.

² <https://www.pc.gov.au/inquiries/completed/supply-chains/report/supply-chains.pdf> pg.209

³ https://www.swissinfo.ch/eng/storms-on-the-high-seas_swiss-merchant-navy-celebrates-75th-anniversary/42192838

⁴ https://www.swissinfo.ch/eng/politics/merchant-navy-scam_ship-owner-charged-with-fraudulently-claiming-swiss-state-funds-/45437654

⁵ <https://www.houseofswitzerland.org/swissstories/history/plying-worlds-trade-routes-swiss-merchant-navy-75>

Australia risks a redirection of ships enroute to the Australian market

Option 2: Charter

Description of Option:

Significant to distinguish between different charter options, including the distinction between a contract for purchase of a cargo and the contract with a shipping company to transport cargo. There are four different ships contracting arrangements for charter, however we find (3) Time Charter as the most likely option to be employed.

1. Voyage Charter:

- Government would contract ship owner to undertake a voyage from one port to another and would include specific cargo terms in the contract.
- Costing would be determined as a round figure, including all relevant shipping and port costs. This would generally occur where a high number of vessels are available, hence unlikely to engage.

2. Contract of affreightment (COA):

- Government would contract ship owner to undertake multiple voyages from one port to another and the ship owner would provide the vessel. Specific cargo terms would likewise be agreed upon.
- Essentially acts as a long-term agreement to carry a certain amount of non-liner cargo between ports within a specified time period.
- Costing would generally be determined as a round figure per voyage, including all relevant shipping and port costs. This would generally occur in situations where there is a limited number of vessels available.

3. Time Charter:

- Government would contract ship owner to provide a vessel(s) for a specified period, with directions of where the vessel is required. Costing would be based on a time charter fee, covering the cost of vessel and crew
- This would generally occur where there is a limited number of vessels available, the government requires specific vessel(s) to perform a task or deliver specified cargo, and likewise has specific operational needs to control deployment of the vessel.
- Since this is most likely to occur in a coastal trading operation, it may be most useful for the government to implement in an emergency scenario.

4. Demise Charter (Bareboat):

- Government would acquire full control of a company's vessel over a specified period, typically on a long-term basis.
- Although government assumes full control of the vessel, they also maintain responsibility for all associated costs, operation and insurances. Is likewise responsible for crewing.

- This would typically occur where there is a limited number or no available vessels, where the government has specific operational needs, and is most common in coastal operations.

Given charter vessels are majority foreign owned, an interim option may not allow for Australian flagged vessels. However, options per the terms of reference may be phased or piloted.

Establishment Requirements

Administrative & Regulatory Structures:

- Contract defining Charter obligations and availability of Vessel for events as deemed necessary.
- Approvals and appropriations for the funds required for vessel ownership
- Governance and oversight bodies for fleet management and decision-making powers (including staffing for this body)
- Financial structures surrounding the fleet management
- Fiscal incentives and regime for the fleet (debt guarantees, taxation etc)
- Flagging requirements and conditions

Note: General contract law applies to a time charterparty, meaning the hire must not violate any public policy restrictions. No specific statutory interventions with respect to time-charterparties, meaning both contractual parties can agree on risk allocation between the government and ship owner.

Immediate Route Planning:

- East Coast Brisbane to Melbourne, via Sydney alleviating Inland rail cargo route expected increases. Vessels would transport goods along the East Coast to reduce impact of land movements of international cargo
- East to West coast corridor – Main route for domestic containerised cargo within Australia. Estimated to be 70-90% of containerised cargo is currently moved by rail.
- Bass Strait is currently served by Ro-Ro vessels and only Australian flagged vessels operate under a General Licence on this route.
- Australia to Pacific Islands. Provides dedicated vessel with regular roster of movement to provide goods and services between Australia and Pacific region.
- Australia to Japan. 3rd largest trading partner in the region and 2nd largest export destination. Provide tax incentives to charter company on regular route.
- Perth to Christmas and Cocos (Keeling) Islands. Current shipping is utilised during the Dry season (March to Sept) when sea states allowing vessels to berth at Flying Fish Cove (CI) and anchor off Cocos Island for barge movements. To note, these ports would likely require small vessels for cargo movement, meaning any strategic support would unlikely be serviced directly by the fleet.

Immediate Workforce Needs

- Ships are chartered on an ad hoc basis, but it is likely that the government would need to identify potential charter companies and specific ships to scenarios that are likely to occur.
- Would need to revise licensing requirements for international vessels to allow carriage of domestic cargo in response to crises scenarios (legislative emergency variations/ exemptions)

Cost Estimates:**Core Fixed Costs –**

Core fixed cost	Vessel	Cost (All costs are listed as \$USD)	Assumption:
Charter Cost:	Medium / Large Cargo Vessels	Cost of charter by size: <ul style="list-style-type: none"> • 3,500 TEU – \$23,000 • 4,250 TEU – \$26,000 • 6,500 TEU – \$46,000 	This figure is sourced from the Harper index of cargo chartering costs. The vessel size was determined through vessel container vessel calls by capacity at Australian ports.
	Aframax vessel	The market range for chartering Aframax vessels is between \$23,000-\$45,000 per day	This figure is informed by desktop research of chartering costs. Aframax is used for the majority of Australia's crude imports and exports.
	210m Ro-Ro	The Australian charter cost of a 200m Ro-Ro is \$73,000 per day	This figure is informed by desktop research of recent sales. The vessel size was determined by management considerations.
Registration	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	The total registration fees inclusive of ships required to be registered, the application for Continuous Synopsis Record, safe manning determination and net tonnage fees for each of these vehicles is 41,507	This figure is informed by registration costs and charges in the Australian Maritime Safety Authority

Core Variable Costs –

Core fixed cost	Vessel	Cost (All costs are listed as \$USD)	Assumption:
Bunker Rate	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	The 1-year VLSFO Bunker price (max 0.5% sulphur) average for APAC \$850	This figure was determined through desktop research. VLSFO (max 0.5% sulphur) was used as the minimum standard in Australia.
Port fees	Medium / Large Cargo Vessels Aframax vessel 210m Ro-Ro	<p>The average port fee (incorporating ship-based and cargo-based charges for major ports is approximately \$114 per TEU.</p> <p>The average port fee for fee (incorporating ship-based and cargo-based charges) for smaller ports is approximately \$94 per TEU.</p>	<p>This figure is sourced from the Australia Productivity Commission's report 'Lifting productivity at Australia's container ports' 2022.</p> <p>This figure is sourced through desktop research a selection of fees and charges reports from smaller ports in Australia from 2022.</p>

Benefits:

- Charter market provides access to a wide variation of specialised vessels that could be utilised to address unique crises issues, allowing the government to acutely respond to natural disasters and emergencies.
- It could also more feasibly support commodities subject to urgent point in time supply fluctuations vs a dedicated owned vessel which may not be warranted/be commercial to viable to do so (i.e., grain shipping from the West to East Coast)
- Considered to be more cost effective on a case-by-case basis, where chartered ships can be tailored to specific needs.
- Ships are still operated in Australia and have the possibility to be crewed by Australians in the interim (latter is unlikely to occur in any other scenario than Bareboat).
- A plain charter type regulates in two key areas; the time and the hire rate of charters. More complex and longer-term charter types may include options to purchase the vessel or the option to extend the charter period.

Risks:

- It is highly unlikely that these vessels would be able to be strategically redeployed, given the already limited requisition powers over Australian flagged ships (of which the majority of charter vessels would not be). As it presently stands, The Coastal Trading Act, National Law Act and Navigation Act do not currently contain any rights for the Commonwealth to requisition or acquire a vessel for use by the Commonwealth. However, there potential avenues under

the Defence Act such as “impressment” that allows for taking control of a vessel for defence purposes provided it is on just terms.

- In the event of a humanitarian crisis, international-flagged vessel could not be requisitioned, and while charterable, may not agree for political reasons/operating risks to supporting the ADF and other Australian-flagged commercial vessels in nation-sustaining activities.

Option 3: Lease

Description of Option:

Financing option; would occur if the Australian Government used financial instruments, via lease agreements, to underpin shipping capacity that could be drawn down in times of need.

The typical form of lease here would be bareboat leasing, where possession passes to the lessee and is returned to the lessor at the end of the lease. During this lease period, the lessee assumes operating costs for the ship and effectively acts as the owner. The lessor then resumes all associated vessel responsibility at the conclusion of the lease.

Lease payments would consist of:

- Fixed payments (less any lease incentives available), and variable lease payments that may depend on an index or rate.
- Amounts expected to be payable by the lessee (govt.) under residual value guarantees
- The exercise price of a purchase option (if exercised in a time of need)
- Payments and penalties for terminating the lease (especially if the government decides to reduce the size of the interim fleet, or expand the number of Australian owned and operated ships)

Establishment Requirements

Administrative & Regulatory Structures:

- Approvals and appropriations for the funds required for vessel ownership
- Governance and oversight bodies for fleet management and decision-making powers (including staffing for this body)
- Financial structures surrounding the fleet management
- Fiscal incentives and regime for the fleet (debt guarantees, taxation etc)
- Flagging requirements and conditions
- Requisition requirements

Immediate Workforce Needs

Contracting agreements with shipping companies and/or cargo operators, that would be more cost effective and socially beneficial if the government were to exit the lease option contracts, than chartering or owning the ships outright.

Requirements for Australian crews to be prioritised over other Nationalities or a Majority portion of the crew makeup.

Cost Estimates:

Core Fixed Costs –

Core fixed cost	Vessel	Cost (All costs are listed as \$USD)	Assumption:
Lease Cost:	Medium / Large Cargo Vessels	Cost of the lease by size: <ul style="list-style-type: none"> Up to 3,999 TEU – \$149,000 per day 4,000-5,999 TEU – \$160,000 	This figure is informed by desktop research of recent sales. The vessel size was determined through vessel container vessel calls by capacity at Australian ports.
	Aframax vessel	NOT AVAILABLE	
	210m Ro-Ro	NOT AVAILABLE	
Registration	Medium / Large Cargo Vessels	The total registration fees inclusive of ships required to be registered, the application for Continuous Synopsis Record, safe manning determination and net tonnage fees for each of these vehicles is 41,507	This figure is informed by registration costs and charges in the Australian Maritime Safety Authority
	Aframax vessel		
	210m Ro-Ro		

Core Variables

Core fixed cost	Vessel	Cost (All costs are listed as \$USD)	Assumption:
Bunker Rate	Medium / Large Cargo Vessels	The 1-year VLSFO Bunker price (max 0.5% sulphur) average for APAC \$850	This figure was determined through desktop research. VLSFO (max 0.5% sulphur) was used as the minimum standard in Australia.
	Aframax vessel		
	210m Ro-Ro		
Port fees	Medium / Large Cargo Vessels	The average port fee (incorporating ship-based and cargo-based charges for major ports is approximately \$114 per TEU. The average port fee for fee (incorporating ship-based and cargo-based charges) for smaller ports is approximately \$94 per TEU.	This figure is sourced from the Australia Productivity Commission's report 'Lifting productivity at Australia's container ports' 2022. This figure is sourced through desktop research a selection of
	Aframax vessel		
	210m Ro-Ro		

			fees and charges reports from smaller ports in Australia from 2022.
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Benefits:

- Real options provide rights, without significant obligations, to holders, enabling them to initiate, abandon, expand, or reduce their capital investment without a significant initial investment, preserving working capital.
- Leasing allows for more sophisticated risk sharing and operational arrangements given the lessee retains ownership, but operational decisions are at the discretion of the operator. There could also be buy options at the end of the lease.
- Registration and certifications would be handled by the lessee, but there is the potential option to temporarily change the vessel flag during the lease through bareboat charter registration. This may afford this interim option the desired Australian flagged status per the terms of reference.⁶
- Bareboat leasing would offset potential depreciation concerns the government might otherwise be responsible for (given lessee retention of ownership)
- The lessor, as opposed to the government, is responsible for re-employment of the ship and any technological obsolescence.
- A lease could be favourable interim option for critical commodities where there is regularity and medium-to long term need for shipping capability. As per Paper A, this could include refined petroleum and crude oil.
- Government likewise has the choice to engage in "wet leases" that include crews and maintenance, (and possibly fuel costs) built into the lease rate. The government may engage in a wet lease when they need short term replacements or supplements to the fleet over a longer than expected period.
- Moreover, the government could decide to engage in either pure leasing deals or sale-and-leaseback deals. Ship leasing offers advantages to ship operators, such as fleet flexibility and low initial cash-out solutions for ship financing. If the market were to further deteriorate, then leases can form a part of the exit strategy.
- A cheaper strike price granted in the option provisions could provide greater option value, however this comes with the added caveat that one may have to pay higher daily higher rates.
- Risks can be reasonably distributed between the lessor and the shipping company (being the lessee)

Risks:

- After outright acquisition, leasing is the second most costly interim option, at typically \$160,000 per day.

⁶ https://commons.wmu.se/cgi/viewcontent.cgi?article=1390&context=all_dissertations – pg 33

- Leasing is less flexible than chartering, due to fixed terms and length of commitments. Dry bulk carriers and tankers are subject to more volatile capital prices and freight rates and would be less likely to lease their vessels.⁷
- It is highly unlikely these vessels would be able to be strategically redeployed, given the already limited requisition powers over Australian flagged ships (of which the majority of leased vessels would not be). As it presently stands, The Coastal Trading Act, National Law Act and Navigation Act do not currently contain any rights for the Commonwealth to requisition or acquire a vessel for use by the Commonwealth. However, there potential avenues under the Defence Act such as "impressment" that allows for taking control of a vessel for defence purposes provided it is on just terms.
- If the lessee (shipping company) defaults, and a lender exercises mortgage rights against the ship, the lessor has virtually no recourse.
- Very high penalty or higher price potentially payable by the lessee for pre-terminating the lease, meaning the government may be disincentivised on early termination (making the arrangement inflexible).

Underlying risks, inherent to a leasing strategy for the fleet include:

- Market volatility risk, resulting in large swings in asset value prices.
- Risk of physical damage, to the underlying maritime asset or its equipment.
- Poor regulatory structures making leasing cost prohibitive

⁷ Ibid, pg 49