PILBARA PORTS

Pilbara Clean Fuel Bunkering Hub

Ammonia Energy Association – APAC 2025

June 2025

PILBARA PORTS

Acknowledgement of Country

Pilbara Ports acknowledges the Traditional Owners of the land and waters in which we operate and pay our respects to Elders past and present.

Our journey

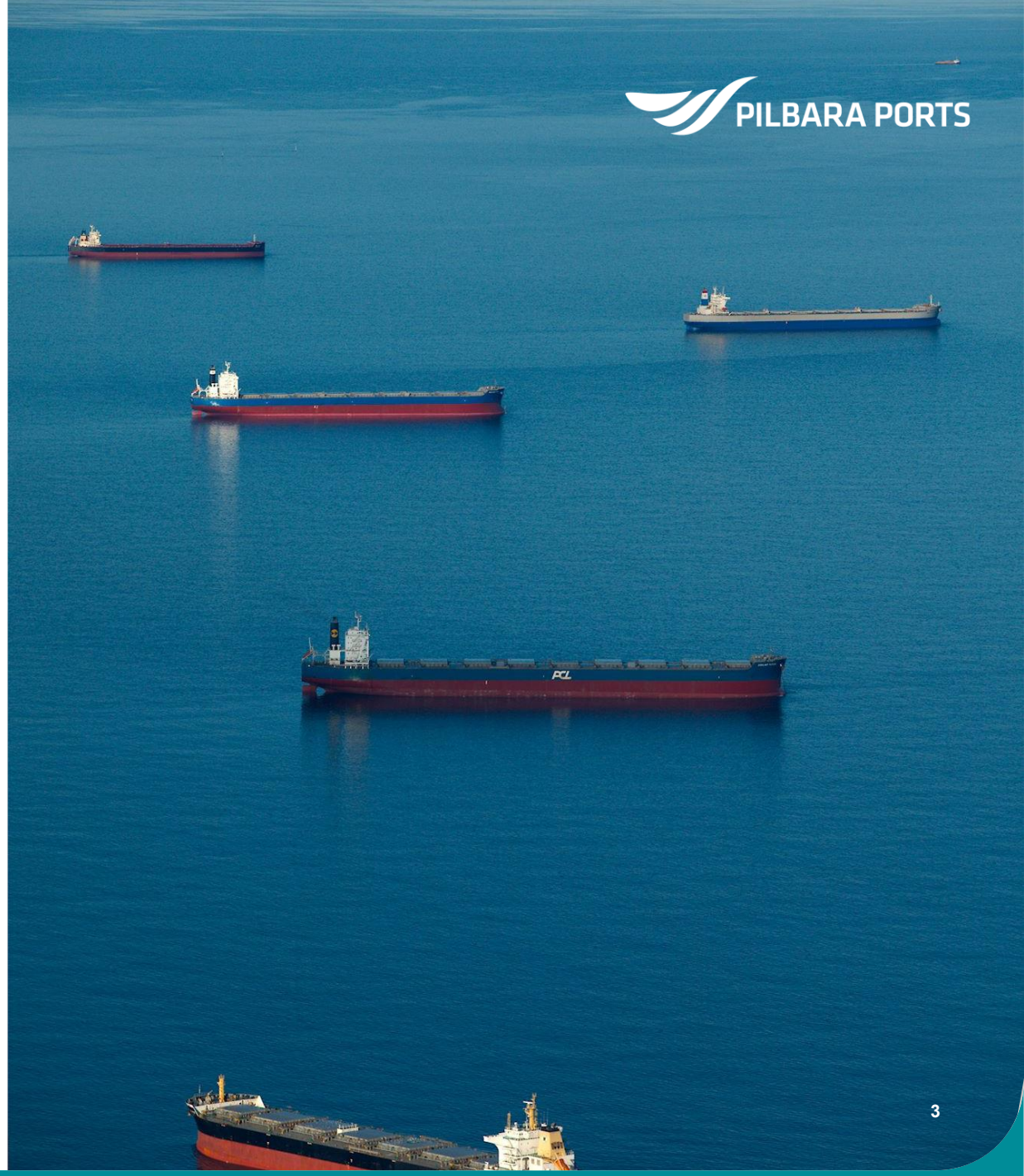
In 2023-34, iron ore vessels visiting our ports consumed more than **3.2 million tonnes of heavy fuel oil**, contributing more than **9.9 million tonnes of CO2e** to the atmosphere.

These emissions are Scope 1 and Scope 2 for our customers, and Scope 3 for Pilbara Ports.

Pilbara Ports has been meeting with customers since 2023 to find collaborative ways support our customers in decarbonisation of their maritime fleets.

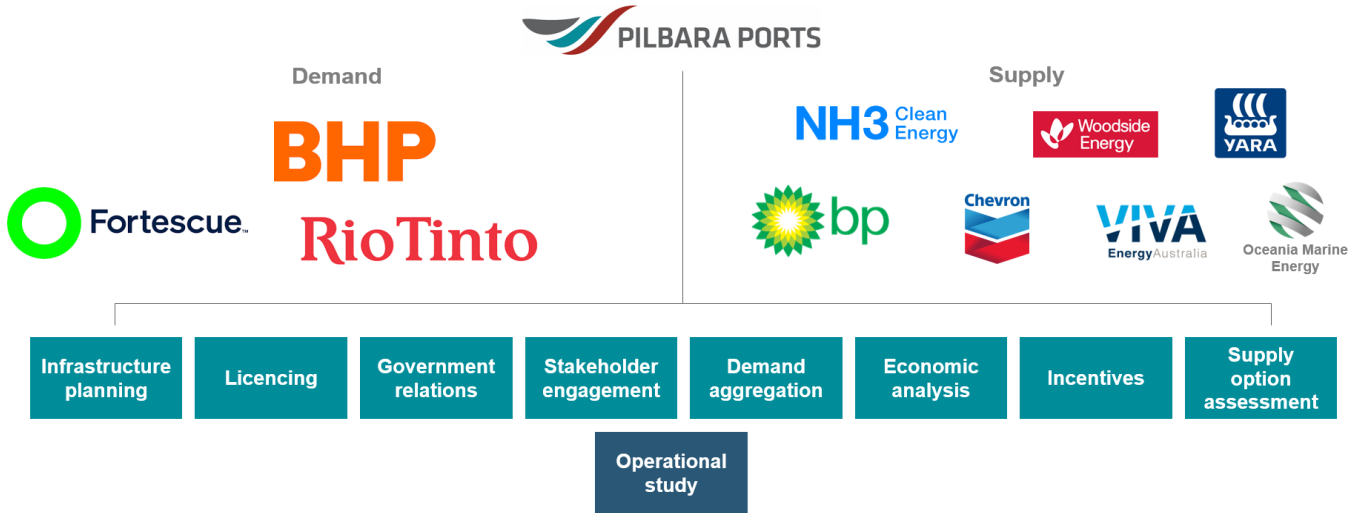
To do this, Pilbara Ports is advancing on the development of a Pilbara Clean Fuels Bunkering Hub, to enable port users to bunker low carbon ammonia as a marine fuel.

This would mean that same iron ore fleet operating on low carbon ammonia would produce less than 560,000 tonnes of CO2e per year, a **94 per cent reduction**.



Pilbara Clean Fuel Bunkering Hub

- Pilbara Ports is working to establish the Pilbara Clean Fuel Bunkering Hub, enabling port users to bunker locally-produced low carbon ammonia as a marine fuel.
- Our goal is for 100 per cent of bulk export vessels departing the Pilbara to be powered by clean fuels.
- Decarbonisation of the shipping fleet is one of the most significant economic opportunities for the Pilbara, and Pilbara Ports will play a key role in supporting our customers to reduce their emissions.
- To successfully establish the Pilbara Clean Fuel Bunkering Hub, Pilbara Ports is undertaking a comprehensive, multi-faceted approach across nine key workstreams.
- We are partnering with key industry partners to operationalise the Pilbara Clean Fuel Bunkering Hub.



Strategic workstreams

Government relations

Achieve strong support from State and Federal Government for the implementation of the strategy

Stakeholder engagement

Meaningful engagement with key stakeholders to leverage support and progress implementation of strategy

Tactical workstreams

Incentives

Develop incentive options, including potential abatements or discounts, for all parts of the supply chain

Supply option assessment

Understand all options to deliver clean fuel supply options for bulk customers

Demand aggregation

Develop and maintain a demand aggregation model from 2026 to 2050

Economic analysis

Finalise economic analysis and seek working group approval by mid-2025

Operational workstreams

Infrastructure planning

Engage with stakeholders to develop infrastructure plans

Licencing

Develop an ammonia bunkering licence template by the end of 2025

Operational study

Identify how viable bunkering is at Port Hedland anchorage and understand different bunkering options for each port

International interest

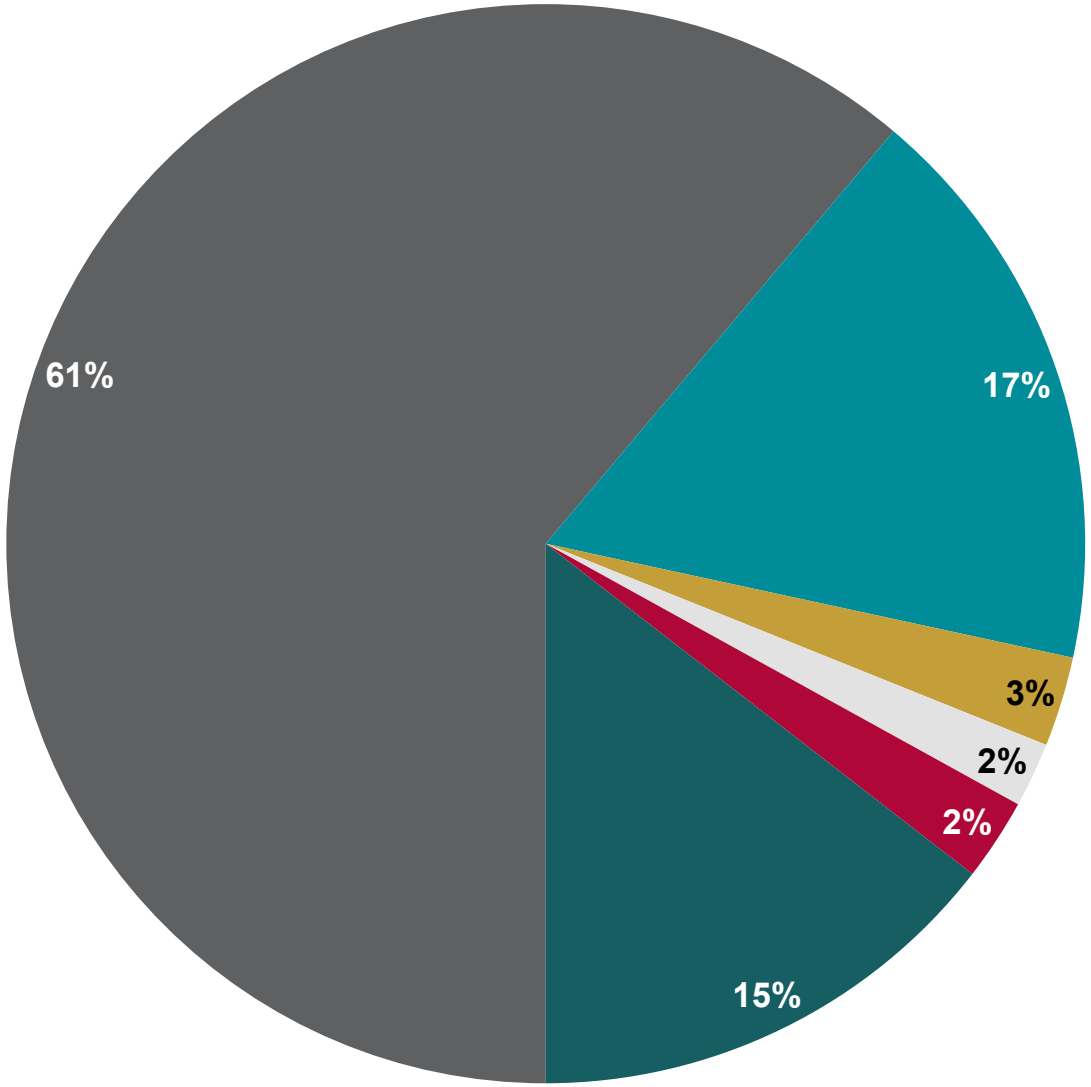
- Port of Himeji
- Port of Rotterdam
- Port of Ulsan
- Port of Bremerhaven
- Maritime Port Authority Singapore
- Global Centre for Maritime Decarbonisation (GCMD)
- International Maritime Organisation (IMO)
- Department of Infrastructure, Transport, Regional Development, Communication and the Arts (DITRDCA)

Analysis

Overview

- Price gap between heavy fuel oil and low carbon ammonia can be upwards of $1,000,000 per trip
- This gap needs to be solved to support uptake of low carbon or green ammonia
- The International Maritime Organisation has released a draft net-zero framework with a two-tiered Gas Fuel Intensity pricing system to penalise emitters and reward early low carbon fuel users
- The framework, to be voted on in October, indicates the price gap could be closed as early as 2030, leaving a relatively short period of time to solve for

Pilbara iron ore fleet



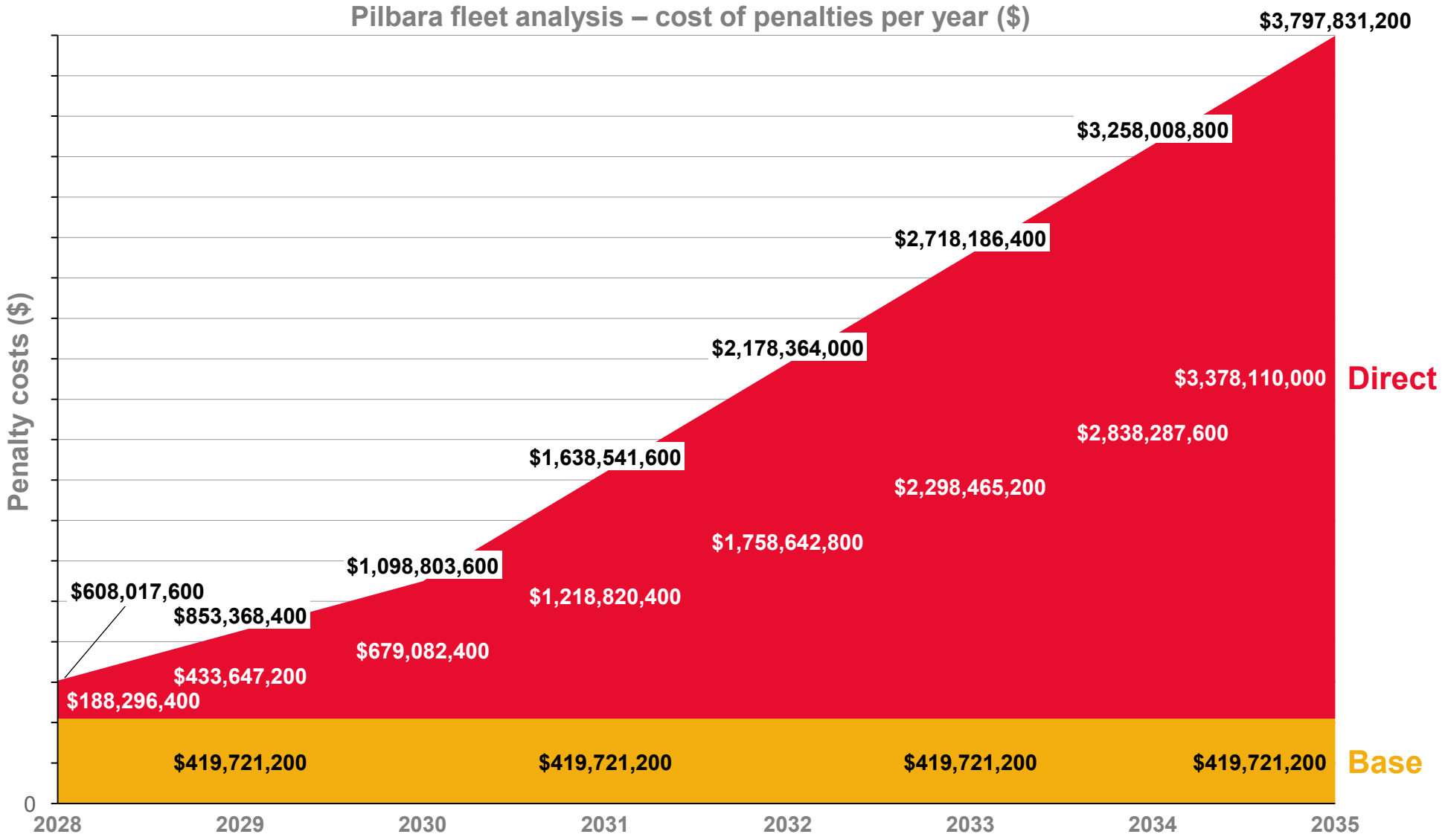
Iron ore fleet analysis from 2023-24

- 3,865 vessel arrivals
- 1,055 distinct vessels
- More than 24.5 million nautical miles travelled*
- Approximately 3.2 million tonnes of heavy fuel oil consumed*
- More than 9.9 million tonnes of CO2e emitted*
- 2 per cent of fleet deviating to Singapore to bunker, adding time, cost and emissions
- CO2e generated adds to Pilbara Ports' Scope 3 emissions profile

China - Port Hedland - China
China - Dampier - China
South Korea - Port Hedland - South Korea
South Korea - Port Hedland - China
Deviated to Singapore
Other

*To and from the Pilbara alone, does not include travel undertaken elsewhere throughout the year

Analysis – IMO Framework



Overview

The graph shows an estimated aggregate total of IMO penalties that will apply to the Pilbara fleet.

It is based on FY24 vessel visit information, specifically iron ore vessel, but de-identified.

Analysis assumptions

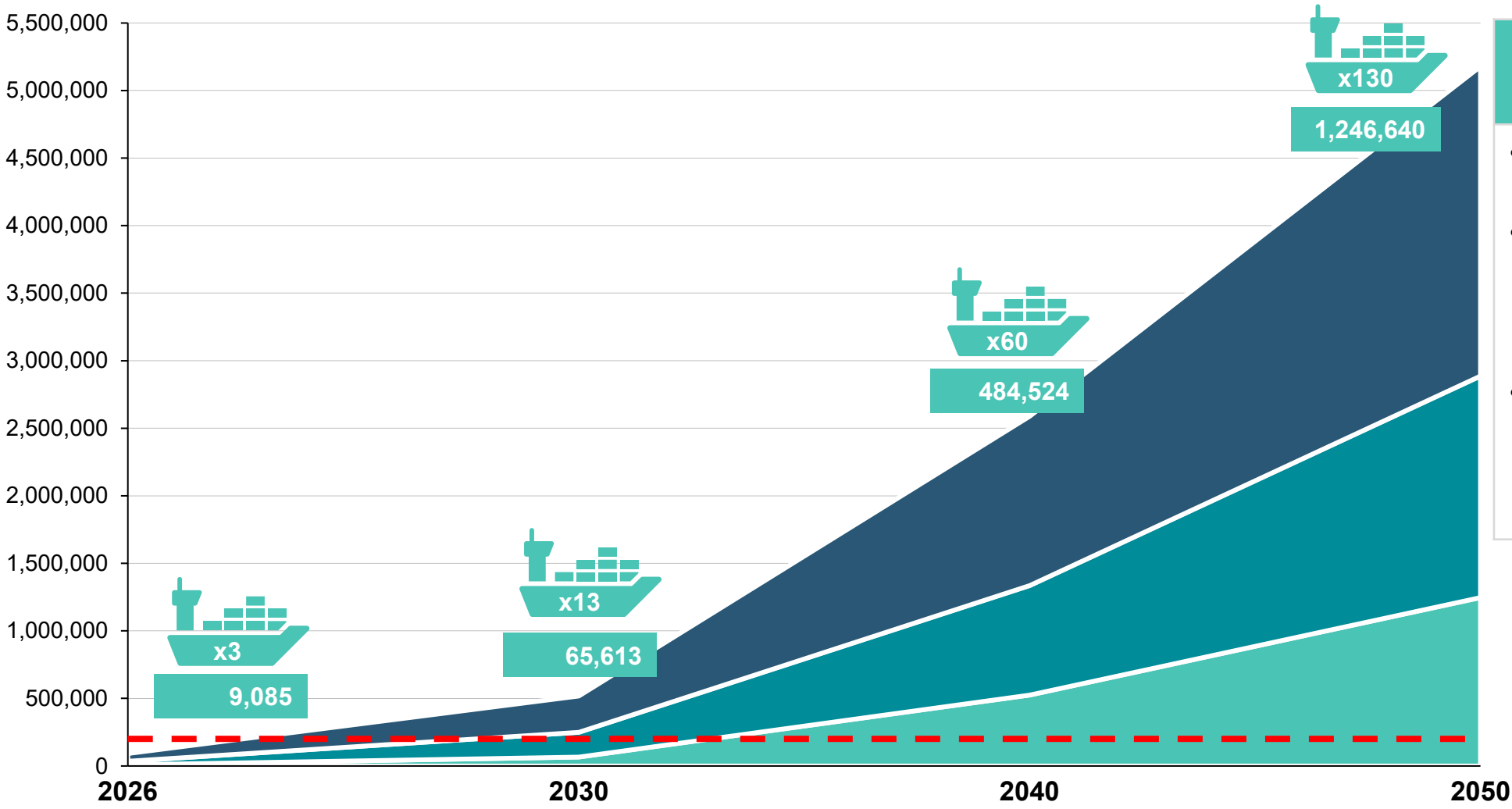
- FY24 figure of 1,055 distinct vessels visiting the Pilbara
- Consuming 8,000 tonnes of HFO per annum
- Base cost is Tier 1 IMO penalty rate
- Direct cost is Tier 2 IMO penalty rate

Pilbara solution

Green corridor

- Establishing a Pilbara Clean Fuel Bunkering Hub will provide an alternative to deviating to Singapore
- Deviation costs approximately $200,000 and adds two days of travel time
- Bulk customers have indicated a strong preference for ammonia as the transition fuel of choice
- Our ports are located in close proximity to ammonia producers, export infrastructure, and the global bulk carrier fleet
- Pilbara Ports has 15 years experience in handling ammonia at the Port of Dampier
- Singapore will not be a producer of ammonia, and will rely on imports to supply the bunkering market, adding cost and well-to-wake emissions to the product
- China will produce some green ammonia, primarily for domestic use

Ammonia demand scenarios

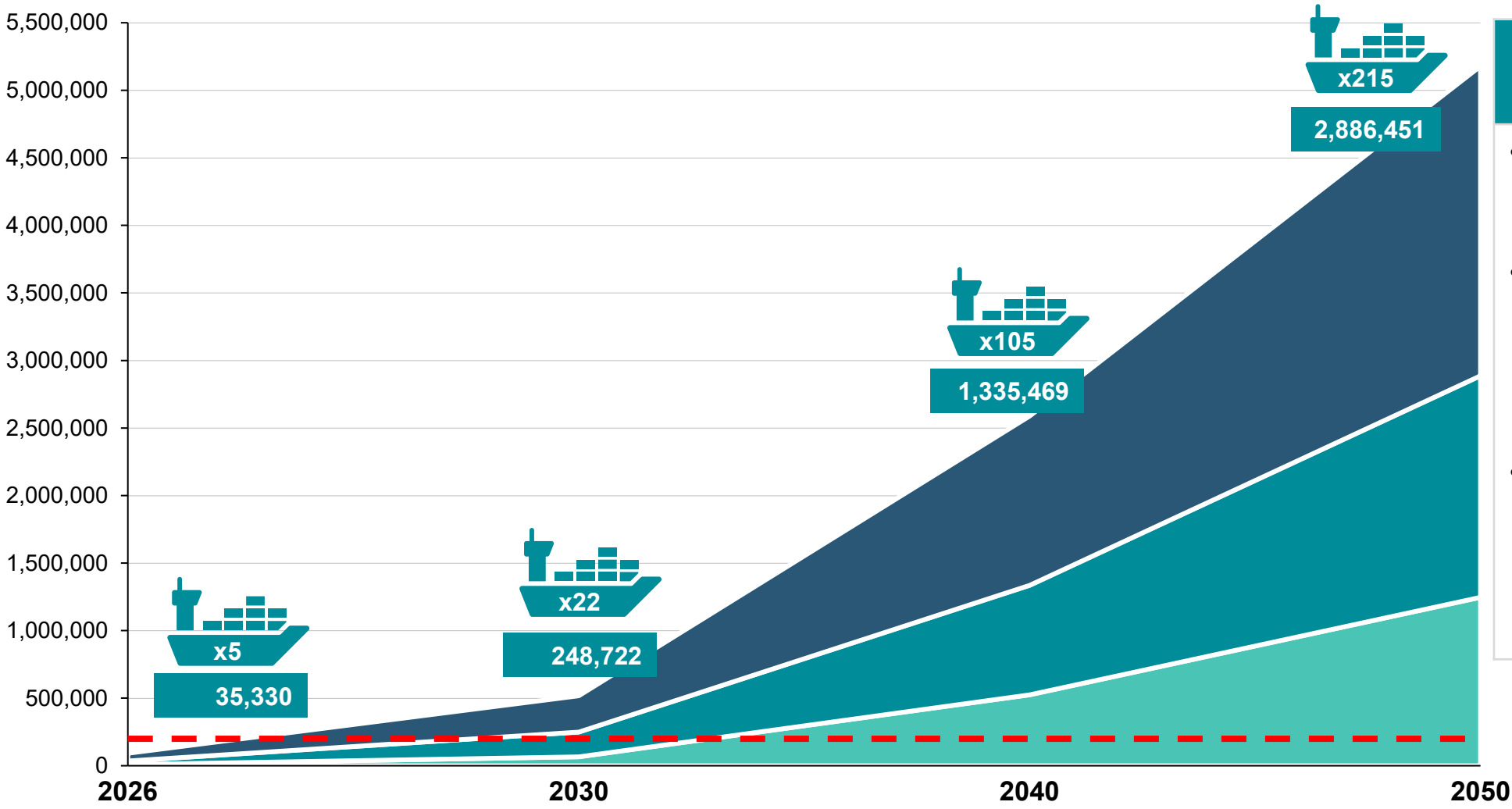


Ammonia demand (tonnes)

Low demand scenario

- Assuming low vessel uptake
- Low calling rate (Five visits to the Pilbara each year)
- Low ammonia fuel mix (30 per cent in 2028 to 95 per cent by 2050)

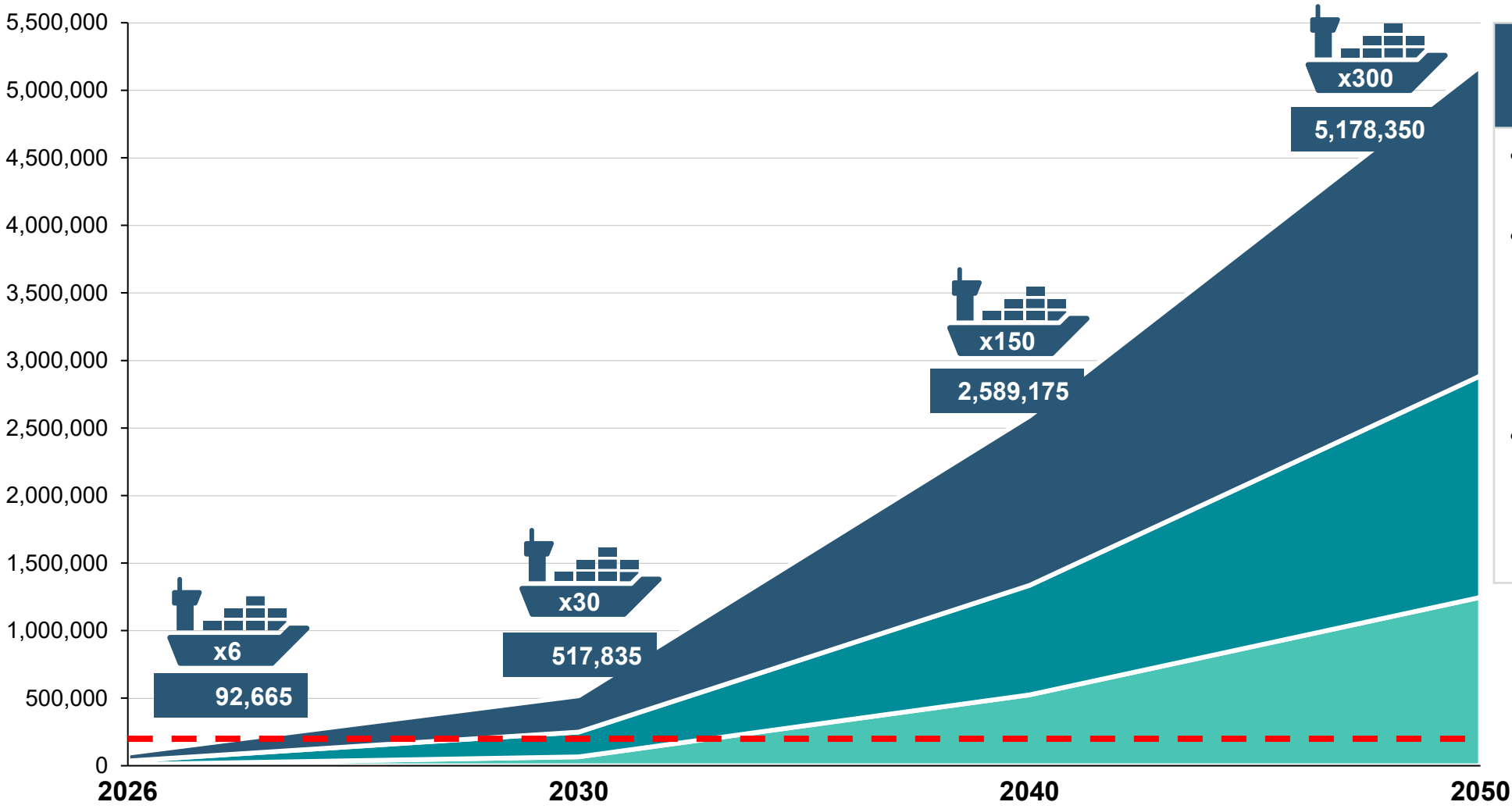
Ammonia demand scenarios



Mid demand scenario

- Assuming moderate vessel uptake
- Regular calling rate (7 visits to the Pilbara each year)
- Moderate ammonia fuel mix (50 per cent in 2028 to 95 per cent by 2050)

Ammonia demand scenarios

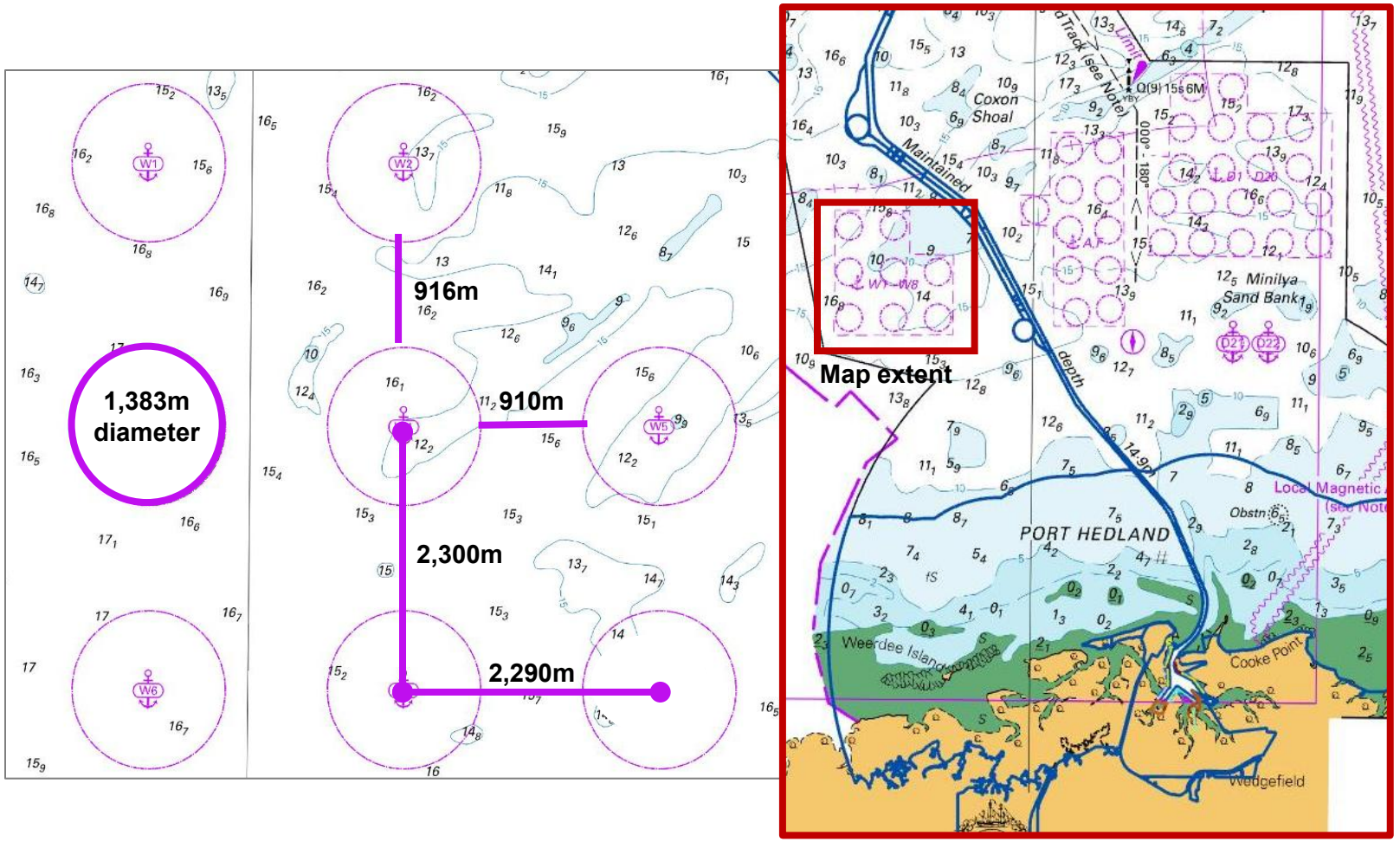


Ammonia demand (tonnes)

High demand scenario

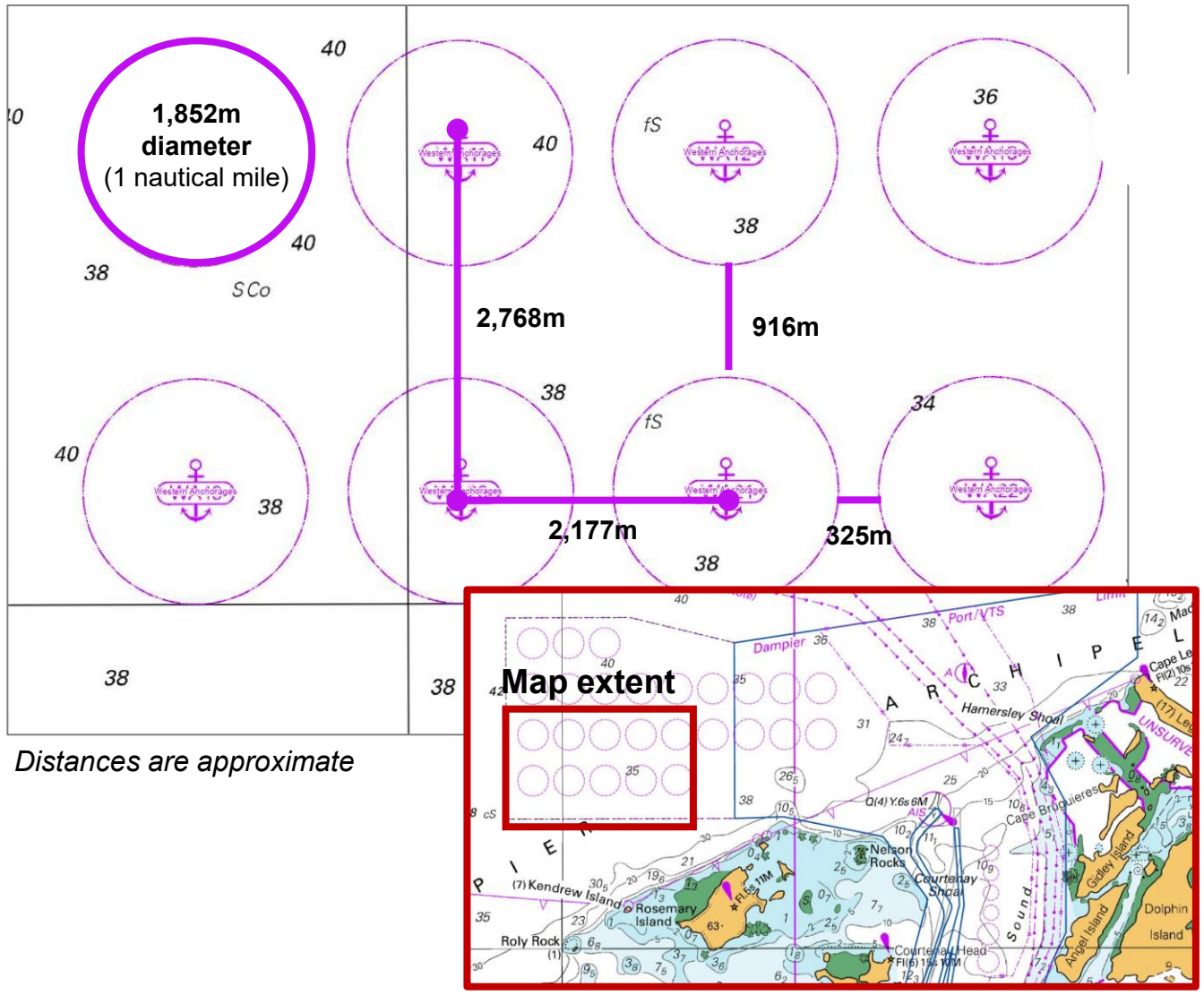
- Assuming strong vessel uptake
- Frequent calling rate (9 visits to the Pilbara each year)
- High ammonia fuel mix (85 per cent in 2028 to 95 per cent by 2030)

Port of Port Hedland anchorages



- Map extent is the preferred location for ammonia bunkering
- Distances between anchorages are ample to allow for exclusion zones during bunkering operations
- Separation from main anchorage zone minimises bunker vessel interaction with other vessels (added layer of safety)

Port of Dampier anchorages



- Map extent are the preferred ammonia bunkering anchorages
- Closest proximity to the Dampier Bulk Liquids Berth
- Outer locality of berths ensures bunker vessel can access ammonia fuelled vessels without navigating around other vessels waiting at anchorage
- Shelter from the coast makes the metocean conditions the most favourable at these anchorages, ensuring maximum operational viability of ammonia bunkering for customers

Launch of the Pilbara Clean Fuel Bunkering Hub Strategy

- ***"100 per cent of bulk export vessels departing the Pilbara to be powered by clean fuels"***
- In collaboration with our industry partners, we have now officially publicly launched the Pilbara Clean Fuel Bunkering Hub Strategy which can be found on our Pilbara Ports website.
- Ammonia has been selected as the fuel of choice by our working group partners.
- Our approach will position the Pilbara as a global leader in low-emission shipping, supporting both economic growth and environmental sustainability.

Thank you

Any questions?

pilbaraports.com.au