



DYNAMAR

GLOBAL REEFER ANALYSIS 2015



REEFER TRADE'S GLOBAL CONTEXT

The seaborne transport of fresh produce in conventional reefer ships and in refrigerated boxes is estimated to have reached more than 95.7 million tonnes in 2015. This equals around 16,400 laden conventional reefer ships of 500,000-cu. ft average, or 3.55 million filled 40' High Cube reefer containers.

Yet, the maritime transport of fresh produce still accounts for 2.7% of the world seaborne trade of dry cargoes of all kinds.

THE ONLY REEFER WAY IS GROWTH

Nearly 7.4 billion souls were populating mother earth by the end of 2015. This -not always so- cosy company is expected to grow further to 8.5 billion by 2030, just 15 years from now. Developing countries, absorbing a substantial share of the growth, see the average income of their populations rising by a CAGR exceeding 6% over the period 2000-2020.

Unavoidably, an increasing part of this income will be spent on more and more luxury food, such as those prepared from perishables, inducing a trend towards smaller shipments.

Oceanic reefer shipping is an all important player in the cold chains across the world, which are facing the challenge

of increasingly dynamic, complex and fragmented logistics.

Until 2020, seaborne perishable trade is expected to expand by 4% to 5% annually. It was close to 5% in 2014 and only slightly less in 2015.

A LONGSTANDING CORE TREND

The core trend of the last few years has been the refrigerated box taking over from the conventional reefer ship. This translated in more than half of all conventional reefer vessels scrapped since the turn of the century with barely any ships ordered, along with increasing liner connections operated with reefer-heavy container ships. This caused the share of the conventional or specialist reefer segment falling back from 60% in 2000 to an estimated 26% in 2014.

OIL DID IT

Due to the sharp decline of oil and the associated bunker prices of US\$300 per tonne at the start of 2015 to \$130 twelve months later, many elderly, fuel-guzzling dedicated reefer vessels became competitive again.

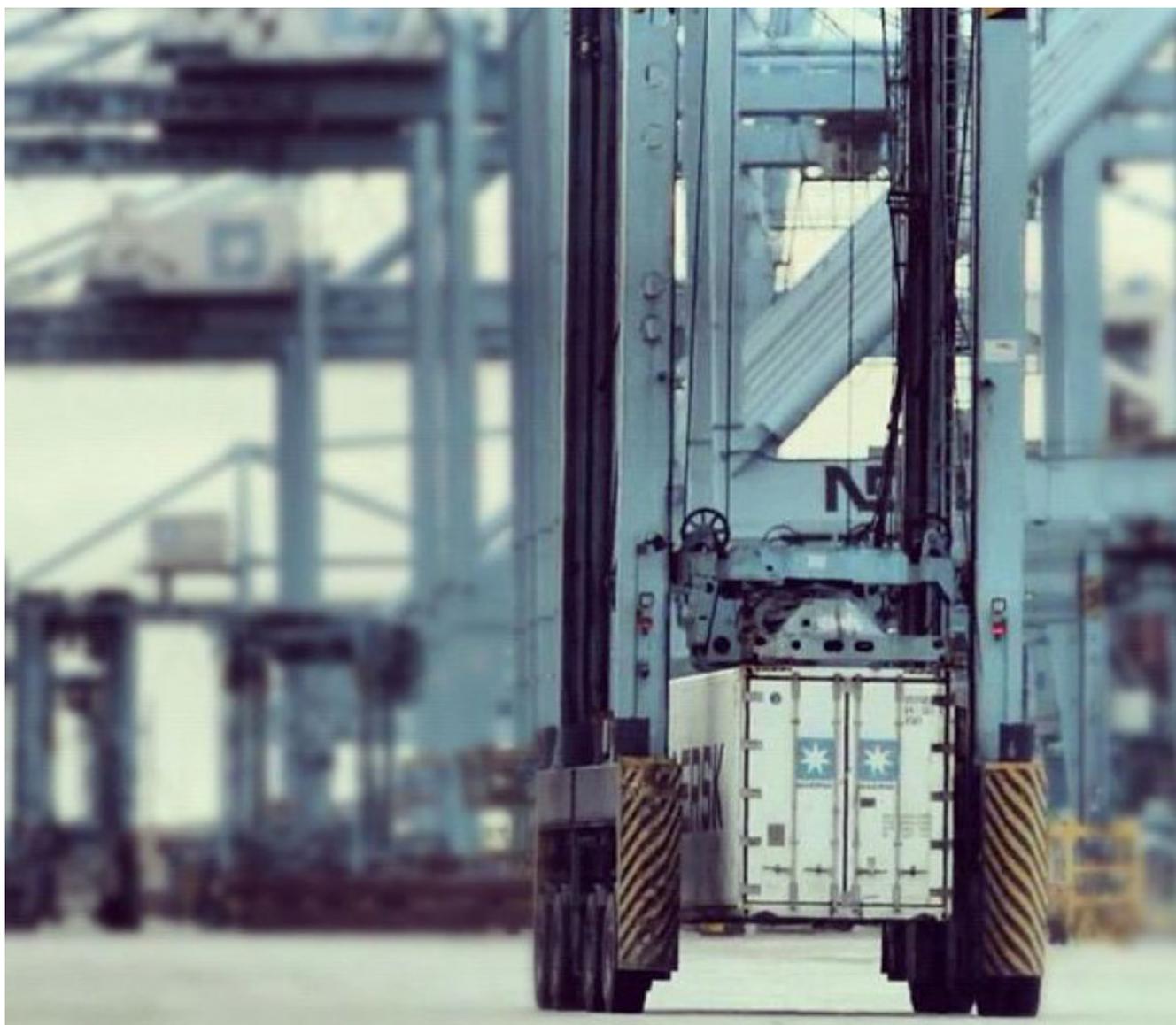
As a first consequence, demolition fell back to just five units, including three in the first half. This constitutes the lowest scrapping activity since 2007 and is paled

by the 65 units super scrapping of 2011.

Although temporarily, one fruit trader switched back from container to conventional. The number of reefer-heavy container ships serving the Southern Hemisphere perishable trades came down, even though slightly.

PUBLICATION HIGHLIGHTS:

- Fresh produce accounts for 2.7% of the world seaborne trade of dry cargoes of all kinds
- The size of the reefer container fleet has reached 2.6 million TEU in 2015
- Conventional reefer capacity is to decline by 41% to 120 million cft by 2025
- Seatrade is the largest conventional reefership operator: 57x 526,000 cft average ships
- Maersk Line has 103,000 installed container plugs on its South/North routes
- Annualised South/North reefer box capacity exceeds ditto conventional space 6.5 times
- 2015 closed with barely any scrapping ... and with a 15 units strong confirmed orderbook



A COMPLETE REVERSAL

2015 saw an almost complete reversal of what reefer shipping had grown accustomed to, which was barely any scrapping, as well as a confirmed orderbook of eleven smaller, up to around 350,000 cft, conventional reefer vessels, plus four (perhaps six) full 2,200 TEU reefer container ships.

Some parties prefer a secretive stand towards their newbuilding intentions and, post-publication, it came to the fore that Japanese non-operating owner Nissen Kaiun Co had ordered four 650,000 cft units in 2014 already. Two of these, to be delivered next year, will be operated by Star Reefers.

Adding it all up, the present reefership-of-all-kinds orderbook counts no less than a minimum of nineteen vessels, excluding options on eight more units.

AN HISTORIC REEFER YEAR?

There are more reasons why 2015 may well go down into history as a year of a profound, perhaps decisive, change to the

worldwide ocean transport of perishables. It involves a crucial change of course of the world's dominant conventional reefer operator, and fits in entirely with the expected trend towards smaller shipments.

In July, Antwerp-based Dutch-owned Seatrade Chartering ordered four 2,200 TEU box ships from the Chinese Zhejiang Yangfan yard plus options on four more identical ones. Meanwhile these orders have been upped by two firm and two optional ones, all forming part of Seatrade's "2020 fleet renewal" program. By the end of this decade, this will add 20 such container vessels to its current fleet, which currently consists of 86 conventional units, of which the largest 54 are ranging between 450,000 and 650,000 cft.

As opposed to reefer-heavy (1) ships as generally deployed by container liner operators in the Southern Hemisphere trades, the new Seatrade vessels will be full-reefer-capacity units. This means that they will carry a full load (by deadweight) of filled, almost exclusively 40' high-cube

refrigerated containers connected to 670 up to 770 plugs.

1) Reefer-heavy box ships: number of plugs is more than 20% of their TEU capacity or they have over 1,000 plugs

Other important specifications include the new ships' up to 20 knots speeds and maximum draft of 9.2 metres. This will enable them to continue calling the generally smaller specialised reefer ports near produce-growing regions as presently served with smaller specialist reefer vessels. Hence, Seatrade can operate its full reefer box ships according to the tested conventional scheduling.

As fast and as shallow as Seatrade Chartering's largest conventional ships, but: with a three times as large capacity expressed in pallets. The new ships' up to 14,400-pallets average capacity compare to the 4,000 to 5,500 under deck pallet space for the company's around 50x 450,000 to 650,000 cft specialist vessels.

And here's what clearly stands to happen: Seatrade's "2020 fleet" will

Ranking	OPERATOR	Ships	Cft capacity	SHARE
1	Seatrade	57	29,968,000	14.7%
2	Baltic/Cool	42	24,541,000	12.1%
3	Frigoship	38	13,076,000	6.4%
4	GreenSea	39	11,224,000	5.5%
5	Network Shipping	18	8,134,000	4.0%
6	Star Reefers	9	4,964,000	2.4%
7	Fyffes	8	4,566,000	2.2%
8	Africa Express	8	4,470,000	2.2%
9	Maestro	6	4,079,000	2.0%
10	Great White Fleet	6	3,651,000	1.8%
Top 10		231	108,673,000	53.5%
Other operators		393	94,608,000	46.5%
Grand Total		624	203,281,000	100.0%
Share Top 10		37%	53%	

Note: Capacity has been allocated to the carrier actually responsible for the long-term commercial operations of the ships

Trades	Services number	Carriers number	Ships		
			Number	Avg TEU	Avg plugs
Latin America	66	30	443	4,900	710
Sub Saharan Africa	43	27	315	4,600	510
Australasia	31	23	186	4,100	500
Total	127	44	871	4,500	590

Trades	Services number	TOTAL TEU	Total Plugs	Weekly TEU	Weekly Plugs
Latin America	66	2,150,000	313,000	323,000	46,900
Sub Saharan Africa	43	1,451,000	160,000	198,000	21,900
Australasia	31	754,000	93,000	127,000	15,500
Total	127	3,912,000	514,000	572,000	74,900

ultimately replace most if not all of its largest conventional vessels, therewith heralding (the start of) a factual shift of the world's largest conventional reefer operator to the container segment.

Who will be first follower?

HERE TO STAY

Something which is not expected to become the subject of containerisation ever is the freezer segment. This concerns smaller but highly specialised, dedicated reefer ships designed for direct high-seas vessel-to-vessel transshipment and carriage of fish or meat.

Some analysts expect a hugely growing demand for fish and seafood in particular; and including what they call an unmatched market penetration for less developed countries.

The current orderbook comprises 11

such vessels, of which four were ordered for Seatrade' GreenSea Pool, while it took an option on four more similar 8,000-dwt/350,000 cft units.

RISKY FLEET FORECAST

With all of the above in mind, any conventional reefer fleet forecast tends to become a risky issue. Taking the pace of scrapping and the rising scrapping age in mind and assuming no substantial newbuilding, there should theoretically be a fleet of a combined capacity of some 120 million cft left by 2025, down 41% from today. This would equal 340 vessels at the current 325,000 cft average. However, if Seatrade's shift to the box is adopted by other operators, scrapping will accelerate and the numbers will look different in 10 years from now.

Determining the container segment's reefer produce carrying capacity is the refrigerated box. Having increased by 6.5% year-on-year, the vast majority of this now around 2.6 million TEU fleet comprises 40' High Cube units for which over 2 million (+7.5%) on-board plugs are available.

A CAPACITY COMPARISON

The 870 container ships operating the reefer heavy South-North trades are equipped with some 510,000 plugs to accommodate an average of 13 plugs (ranging between 10 and 13) per 100 TEU. The relevant services are extensively presented and analysed in the Dynamar report, which found that the overall weekly trade capacity increased by 7% to 571,000 TEU.

The (theoretical) annualised refrigerated capacity of all these reefer-heavy South-North container services is calculated at 9.22 billion cft. This compares to the ditto 1.42 billion cft capacity of the current conventional fleet. In other words, containers exceed conventional capacity more than 6-fold.

THE LARGEST OPERATORS

Seatrade Reefer Chartering (Seatrade Pool) is, unchanged, the largest conventional reefership operator with a (further reduced) fleet of 57 x 526,000 cft average ships. Baltic Reefer including its subsidiary Cool Carriers comes second with 42 units/557,000 cft average.

In the container segment, measured by reefer plugs on its ships operated on South/North routes, Maersk Line is, again, the number one with 103,000 plugs. Hamburg Süd's 87,000 plugs come second, with MSC sitting on its heels with 85,000 such connections.

NO REEFER REPORT WITHOUT REEFER PORTS

Dynamar's Reefer Analysis highlights over 120 reefer ports in more than 40 countries, detailing such data as main perishables and volumes handled, annual reefer ship calls, total port throughput, number of terminal plugs, draught, and so on.

Issued mid-December 2015, DYNAMAR (201%) Reefer Analysis: Market Structure, Conventional, Containers (author: Frans Waals), is Dynamar's latest report on worldwide perishable shipping using conventional reefer vessels or refrigerated containers on box ships.

It uses the most recent trade statistics on reefer commodity data by country and area, supplemented with up-to-date port, vessel, box and carrier fleet statistics and gives a profound insight into

the background, characteristics, goings and present status of the worldwide perishables shipping market and its most relevant players. The 240-page report contains over 230 tables and 80 figures.

Features of Dynamar's 2015 REEFER Analysis- Market Structure, Conventional, Containers include:

REEFER MARKET STRUCTURE(S)

- Historical overview of the background and development of reefer shipping
- Transport modes and characteristics - temperature settings- modern techniques- reefer box technology
- The world perishable trades: volumes by main produce and export regions
- The world's main import regions: US, European Union, Russia, China and Japan
- Trading patterns: conventional ships versus container vessels- main export areas- exports by product and individual country
- Major reefer ports: perishable exports by country- description of relevant reefer handling facilities by mode of transportation- port throughput statistics

CONVENTIONAL REEFER SHIPPING

- Reefer trade developments covering the last three seasons (2015-2013), statistics and graphs, time charter equivalents
- Extensive conventional reefer ship overviews and statistics (existing IMO-registered fleet, orderbook, age profile, demolition, future development)
- Identically structured profiles of the world's 15 largest conventional reefer ship operators, including markets/trade lanes served and their operated fleet (whether owned or chartered)

CONTAINER REEFER SHIPPING

- Container fleet and orderbook, reefer TEU capacity, plug/capacity ratios by size category, total box fleet and refrigerated container fleet (share) by main carrier
- Main reefer box lessors, reefer machinery manufacturers and reefer container makers
- The reefer-heavy containership phenomenon; container heavy shipping services on the most relevant (South/North) reefer routes
- Unique: full details (services, carriers, ships, capacities, plugs) of all South/North container services
- Refrigerated container box fleet, size categories, production data, capacity by carrier
- Identically structured profiles of the world's 15 largest reefer container

carriers, including Southern Hemisphere markets/trade lanes served, their existing fleet and orderbook

Tables: 1) Top 10 conventional reefership operators

EXPLANATORY TEXT:

Combined, the world's ten largest conventional reefer ship operators operate 231 (2014: 244) vessels comprising nearly 109 (113) million cubic feet of reefer space, equalling 54% of the world conventional reefership fleet. The biggest player is Seatrade, whose 30 (31.7) million cft capacity constitutes a share approaching 15%. It is followed by Baltic Reefers, including Cool Carriers. Third comes Lavinia Corp's Frigoship with 11.2 million cft. Of all 231 top ten ships, 199 (219) have between 60 and 390 TEU on deck slots for containers, 205 (185) slots on average.

Four of the perishables traders performing their own shipping needs are part of the conventional top 10: Africa Express Line (Compagnie Fruitière), Great White Fleet (Cutrale/Safra-owned Chiquita), Fyffes and Network Shipping (Del Monte). Others include Cosiarma (GF Group), Dole Ocean Cargo Express (Dole), Ecuadorian Line (Bonita) and Isabella Shipping (Uniban).

Tables: 2) North-South reefer routes operated with reefer-heavy container ships:

EXPLANATORY TEXT:

Altogether, 127 services carrying containers connect the fresh produce-rich Southern Hemisphere of Latin America, Sub Saharan Africa and Australasia with the Far East, the US or Europe. Combined, they accommodate 871 ships of 4,500 TEU/90 reefer plugs average. The aggregated weekly trade capacity is 572,000 TEU and 74,900 reefer plugs. Sixty-six loops connect with Latin America (excluding the extremely fragmented Caribbean-US Gulf/ East Coast), forty-three with Sub Saharan Africa and thirty-one with Australia/New Zealand.

MSC has the largest presence in terms of individual trade lanes served: 18. Its merger with CSAV catapulted Hapag-Lloyd into the second spot with 17 trade lanes, with Maersk Line coming third (16).

As the table includes operations serving more than one trade area, figures in the following table providing an overview do not add up exactly:

More tables can be made available upon request.

DYNAMAR (2015) Reefer Analysis: Market Structures, Conventional, Containers is immediately available and can be ordered for direct download under the link www.dynamar.com/

publications/153 or by contacting Dynamar B.V.

Prices (ex VAT) are as follows:

- PDF: €915

- Printed/bound by priority surface mail: €935

- PDF & printed/bound: €1,000

ABOUT DYNAMAR B.V.

Since 1981, Dynamar B.V. (Alkmaar, The Netherlands) has provided transport and shipping information and consultancy services for the marine, energy and financial sectors. Dynamar is currently world's leading container sector credit risk analyst and a major provider of analytical container shipping news and commentary. Credit Risk Assessment is Dynamar's core business, while the analyst also specialises in:

- Marine intelligence, including cargo and vessel tracking
- Consultancy for the container liner, multipurpose and container port/ terminals industry
- Shipping publications, spearheaded by the DynaLiners portfolio of daily, weekly, monthly and annual analytical news and commentary on the worldwide container trade, and furthermore:
- Dynamar Monthly Markets Monitor (MMM), a 12 x per year report on facts and trends in five main shipping segments: crude tankers- chemical tankers- dry bulk carriers- (conventional) reefer vessels- container ships
- Publications among others comprise analyses on the world's 50 largest container operators, container liner trades and markets reports, ports and terminals studies, as well as a variety of insight topics such as transshipment and feedering, breakbulk, deepsea roro, reefer, and others

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