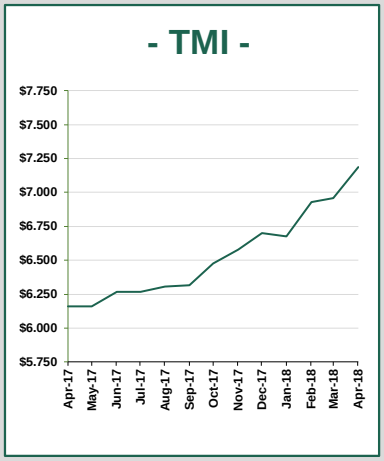
TOEPFER TRANSPORT'S MULTIPURPOSE SHIPPING REPORT

ISSUE NO. 9



CONTENT

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TOP NEWS

Auerbach takes over the technical management of five Thorco ships

- See page 10 in our Industry News -

Dear Reader,

After a somewhat unclear start to the current year there are some signs of a further market recovery. These are noticeable in a clearly increased time charter environment assessed by the - TMI – participants and also in the expansion of service capacities and reorientation of regular services by some of the carriers.

Even with access to capital and the willingness to pay higher prices for suitable tonnage, uncertainty about sufficient freight volumes and thus rising freight rates seems to continue to dominate the mood, at least for the carriers. Increased time charter rates and higher prices for second-hand tonnage may well also be interpreted as an anticipation of a further positive freight level development. Consequently some operators are willing to spend more on such ships as they rely on these rising prices and will now want to secure cargo space and thus market shares.

In addition to growing uncertainty about future trade agreements and the imposition of duties, plus the requirements and long-term earnings prospects for investors, there is the question of what technology should be implemented in newbuildings in the future. These are extremely difficult questions to answer. What impact the advancing digital revolution has now and will have on this industry in the future will be discussed in our - Quarterly Focus on page 13.

In summary we note that, despite some positive signs, the overall situation tends to remain unclear and a sustained recovery in the foreseeable future cannot reasonably be expected. Positive impulses could, however, be a concentration and simultaneous shortage of tonnage through recycling. Both these developments would have a positive effect if the freight volume increased only slightly...

We hope you have an interesting read!

Yours sincerely

SALE & PURCHASE / NEWBUILDING BROKERS

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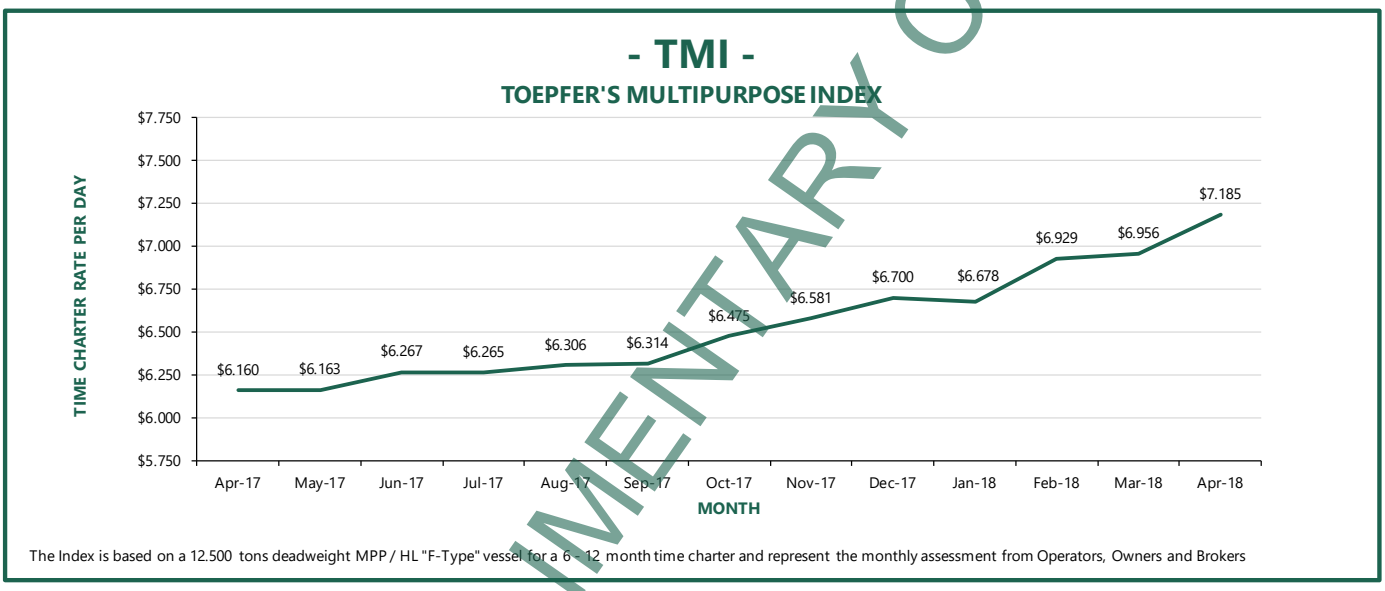
TIME CHARTER MARKET

While the - TMI - in April jumped significantly above the US$ 7,000 mark - and last stood at US$ 7,185 (a similar level was last recorded 2 years ago), it is still far off the 10-year average of US$ 9,017. Even though the - TMI - has been steadily recovering since April 2017, this development has not yet been substantially accompanied by similar positive developments in the freight market. Slight increases in freight rates and volumes are levelled by increased bunker prices; this means that increased time charter costs have a negative impact on many carriers. In addition, overall freight rate levels are not improving. Although we noticed increased freight rates from the Continent to the Far East, this was not the case for cargoes from the Far East, due to higher competition. Other factors are new and smaller players, some of whom have to accept higher prices in order to gain tonnage, and ship owners who use the new competitive situation to earn higher rates for renewals. Last but not least, increased transparency through tools like the - TMI - helps as a basis when arguing for increased rate expectations but a similar jig to measure freight rate development is still missing.



It should not be forgotten that the - TMI - is not a fixture-based index, but rather an assessment of market participants as to what rate level to expect for a 6 to 12-month time charter period. Special terms such as the delivery area, any ballast trips or costs for the phasing in and out of tonnage are not considered. As a general market indicator, the - TMI - is certainly a helpful tool, and some actual fixtures confirm this too, but basically every new charter arrangement is an individual negotiation in which far more factors play a role than just the agreed daily charter rate. Also, the number of actual concluded fixtures must be taken into account, as only with sufficient liquidity of the market can conclusions about development even be possible. For example, the - TMI - represents the market activity of around 100 units and these are only 10% of the total fleet of the MPP / HL vessels.

The fundamental question of a current TC market level can therefore only be conditionally answered and not transferred at all to, for example, the Larger Liner type vessels with about 30,000 tons deadweight, since there is only a very limited time charter market for this type of ship and most players use the majority of the tonnage in their own liner services and consequently it comes only very occasionally to new time charter fixtures. In this segment of 188 units (> 25,000 dwat), only about 20% of the tonnage is regularly traded on the charter market, with very few having crane capacities of more than 250 tons. The number of potential takers is also very limited compared to the E / F type shown in the - TMI - as only a few carriers operate in this segment.

TIME CHARTER MARKET CONTINUED

An even more limited liquidity of the market can be found in the Super Heavy Lift vessel segment with >= 700 tons of combined lifting capacity. Out of 123 units, only 16 ships can be considered as potentially available on the market, of which in turn some are running on long-term contracts or fixed on a bare boat basis. For this market segment the determination of a market rate is therefore only possible from case to case and an indexing is impossible.

TIME CHARTER FIXTURES

NAME	DWAT	BUILT	MAX LIFTING	GEAR	ACCOUNT	PERIOD	LAYDAYS	RATE US$
Marmadura	10.500	2004	120 mt	2 x 60 mt	DS Multibulk	12 mos	Apr. 18	privat
Lisanna	12.787	2004	240 mt	2 x 120 mt	DS Multibulk	12 mos	Apr. 18	7.000
Rike	12.653	2010	360 mt	2 x 180 mt	BBC	24 mos	Mar. 18	7.200
Alina	12.653	2010	360 mt	2 x 180 mt	BBC	24 mos	Mar. 18	7.200
Daisy	12.765	2006	480 mt	2 x 240 mt	Thorco	6 mos	Mar. 18	7.800
Donald	12.767	2006	480 mt	2 x 240 mt	Zeaborn	12 mos	Mar. 18	7.600
Maple Lea	12.720	2007	240 mt	2 x 120 mt	Thorco	6 option 6 mos	Mar. 18	7.200/7.450
Maple Lotta	12.746	2007	240 mt	2 x 120 mt	Thorco	6 option 6 mos	Feb. 18	7.200/7.450

In principle, however, the recent fixtures in the larger liner-type and super-heavy lift segments were also able to benefit from a slightly higher market level, although limited activity made it difficult to translate this into a general trend with a sustainable development.

NEWBUILDINGS

While the general direction of the market is still unclear, the question of which design and technology to use for a newbuilding designed to serve the future market for the next couple of years could eventually cause somebody quite a headache. In addition the situation on the shipbuilding side is also somewhat confusing.

As for many Chinese private yards, financial problems are increasing due to the fact that governmental financial support is decreasing and resulting in delays or non-issuance of refund guarantees. It may therefore be advisable to choose either stronger state-owned yards or alternatively also consider shipbuilding nations other than China.

Price expectations from yards are still on the rise; however second-hand prices remain comparatively cheaper. Consequently the run on second-hand tonnage is unbroken – this precise demand has for the time being not yet reached the builders. Only for small MPP and gearless coasters the newbuilding parity is below second-hand prices and hence many owners consider and discuss new building projects for such units.

Therefore there are not too many concrete new projects for MPP / HL vessels in the market and no new orders have been recorded.

As some yards still have a backlog of delayed and thus cancelled orders, we noticed that the original order from Zeaborn of 6 x 12,500 ton deadweight SDARI F500 designed units has not been picked up by WECO, but partly by HS Schiffahrt for the first two ships and by Briese Schiffahrt for ships numbers 3 and 4. Both deals have been secured in the region of US$18.5 -18.75 mio. For ships numbers 5 + 6 Sanfu Shipyard is still seeking buyers at a similar price level.

Huanghai Shipyard has not yet found a buyer for their SDARI F500, which was originally ordered and later cancelled by Nordic Hamburg some time ago, as the yard is hoping for a similar price to that achieved by Sanfu SY, however potential buyers are not yet willing to pay this.

Another and much older remaining order is for 4 x 14,000 ton deadweight “Amber” types with 2 x 400 ton plus 1 x 80 ton cranes, which, prior to the Lehmann Brothers collapse, were originally placed by Bockstiegel at Union Shipbuilding which in the meantime has gone bankrupt. We assume that realistically only one unit will

NEWBUILDINGS CONTINUED

come through, for which a local trading house seeks employment and buyers, aiming for the low US$ 20s mio. This unit could be ready within 6 months after the contract signing. It is questionable whether someone would be willing to accept a vessel that has already been launched in 2013 with manufacturer guarantees no longer valid …

DELIVERED VESSELS

NAME	DWAT	BUILT	MAX LIFTING	GEAR	OWNER	SHIPYARD	DATE	PRICE US$
Symphony Space	10.546	2018	170	2 x 85 mt	Symphony Shipping	Ferus Smit Shipyard Leer	Mar. 18	

It is also interesting to note that brokers regularly propose 3 x 5,750 ton deadweight with 2 x 60 ton crane-designed ships cancelled by Lauterjung and 2 x 12,000 ton deadweight with 2 x 80 ton craned units originally ordered by Spliethoff at Rongcheng Xixiakou Shipbuilding, which are all basically ready but the appointed trading house is, for whatever reason, not capable of selling them and therefore they are still part of the orderbook and up for sale.

The only real new projects that we see around are from Spliethoff who are on the lookout for a replacement yard after the tearjerking end of one of the highest quality yards in China - Ouhua Shipbuilding. We are excited to see which Chinese yard will be awarded with Spliethoff's innovative R-Class design vessels.

Besides this, we hear that there are several owners in the starting blocks for midsize and liner type ships, but the gap between the asking prices of the shipbuilders and what is achievable on the freight market is still too significant.

ASSET NEWBUILDING PRICES IN US$ MILLIONS

DEADWEIGHT	MAX LIFTING	NO. CRANES	CONTRACT 2002	CONTRACT 2007	CONTRACT 2011	CONTRACT 2015	JANUARY 2018	APRIL 2018
9.000	120 / 160 mt	2	9.50	20.00	14.00	15.00	13.50	13.50
12.500	500 mt	2	14.50	29.00	18.50	19.50	20.00	20.00
30.000	700 mt	3-4	29.00	45.00	39.50	41.00	30.00	32.00

The above prices are for guidance only as these strongly depend on crane capacity and design / quality / makers list.

SALE & PURCHASE

In line with increasing charter rates, asset prices for second-hand tonnage are also climbing up further. Activity remains on the same busy level, even with new players or at least "long time inactive" players appearing on the market again. Since a historical low 13 months ago the market is continuously increasing and we expect this trend to continue as we have gradually less tonnage for sale, with a steady demand and basically no newbuildings being placed which stand alone on the asset side, all leading to increasing prices.

SCRAPPED OR LOST VESSELS

NAME	DWAT	BUILT	MAX LIFTING	GEAR	OWNER	SHIPYARD	DATE	PRICE US$
BBC Lena	9.544	1998	550 mt	2 x 275 mt; 1 x 150 mt	Jüngerhans	Sietas KG	Mar. 18	
ESI Anax	11.900	2001	300 mt	2 x 150 mt	Euroseas International	Dalian Shipyard Co. Ltd.	Mar. 18	2.34
Lady Noor	9.653	1987	100 mt	2 x 50 mt	Barhoum Maritime Co.	Miho Zosensho K.K.	Feb. 18	
Don Alfredo Sr 2	4.110	1993	100 mt	2 x 50 mt	Gothong Southern	Nordsovaerftet A/S	Nov. 17	
Isla Bartolome	3.818	2013	120 mt	2 x 60 mt	Transnave	Western Marine Shipyard	Feb. 17	

As we are noticing in the freight market, there is a similar comeback in the oil and gas industry, which has always been the cream on the coffee for our business. This leads to increased employment of heavy lift vessels in their core fields.

SALE & PURCHASE CONTINUED

After MACS purchased Stinnes Lines earlier this year it became clear that MACS had finally closed their Atlantic triangle service and that more ships would be needed. This has now resulted in the acquisition of two Clipper "N-Class" 17,500 ton deadweight with 2 x 150 ton + 1 x 80 ton craned tweendeckers which MACS long term chartered from Krey Schiffahrt who are quietly growing their tramp fleet.

NSC Shipping Germany is also back on the MPP scene, having also bought two Clipper N-Class to support their South America "Marin Condor Service" business.

ASSET 2ND HAND PRICES 10 YEARS OLD IN US$ MILLIONS

DEADWEIGHT	MAX LIFTING	NO. CRANES	2002	2007	2011	2015	JANUARY 2018	APRIL 2018
9.000	120 / 160 mt	2	4.00	11.50	10.50	6.00	5.00	5.25
12.500	240 / 360 mt	2	6.00	14.50	13.50	8.50	6.75	7.00
30.000	640 / 700 mt	3-4	10.00	28.50	19.50	10.50	9.25	9.75

The above prices are for guidance only as these strongly depend on crane capacity and design / quality / makers list.

With the sale of all four "N-Class" as well as the "Clipper Marlene," Clipper stopped controlling MPP / HL vessels.

Nordic Hamburg was successful in raising equity in Norway through NRP for the purchase of two P1 – types (16,500 ton and 17,500 ton Deadweight respectively; 2 x 400 ton + 1 x 120 ton gear). These were the "Prima Dora" and the "Ocean Giant," with the former remaining commercially managed by United Heavy Lift and the latter having been fixed on a long term bare boat charter to Intermarine's US flag business.

S & P DEALS

NAME	DWAT	BUILT	MAX LIFTING	GEAR	SELLER	BUYER	DATE	PRICE US$
Clipper New York	17.287	2012	300 mt	2 x 150 mt; 1 80 mt	Clipper Group	Krey or NSC	Apr. 18	9.50
Clipper Newhaven	17.299	2011	300 mt	2 x 150 mt; 1 80 mt	Clipper Group	Krey or NSC	Apr. 18	9.50
Clipper Nassau	17.257	2011	150 mt	2 x 150 mt; 1 80 mt	Clipper Group	Krey or NSC	Apr. 18	9.50
Clipper Newark	17.273	2011	150 mt	2 x 150 mt; 1 80 mt	Clipper Group	Krey or NSC	Apr. 18	9.50
HHL Congo	12.546	2011	360 mt	2 x 180 mt	Hansa Heavy Lift	HS Schiffahrt in coop with Dship	Apr. 18	8,65
HHL Rhine	12.590	2011	360 mt	2 x 180 mt	Hansa Heavy Lift	HS Schiffahrt in coop with Dship	Apr. 18	8,65
Simone	7.930	2011	160 mt	2 x 80 mt	Kontor 17	Jebsen Shipping Partner	Mar. 18	5.10
Michelle C	12.946	2010	160 mt	2 x 80 mt	Carisbrooke Shipping	Nova Marine Carriers	Mar. 18	
BBC Nevada	12.737	2006	240 mt	2 x 120 mt	Freese Shipping	Ocean Rising	Mar. 18	5.70
Ocean Giant	17.590	2012	800 mt	2 x 400 mt; 1 x 120 mz	DVB Bank	Nordic Hamburg in coop with NRP	Mar. 18	18,75*
Prima Dora	16.543	2010	800 mt	2 x 400 mt; 1 x 120 mz	DVB Bank	Nordic Hamburg in coop with NRP	Mar. 18	18,75*
Clipper Marlene	17.539	2001	120 mt	3 x 60 mt	Clipper Group	Chinese	Mar. 18	4.00
GB Atlantic	8.973	1996	140 mt	2 x 70 mt	Interglobal Shipping	Poseidon Shipping Co. Ltd	Mar. 18	
Margaretha	17.539	1999	120 mt	3 x 60 mt	LVR Commercial Ltd	SK Turaevo LLC	Feb. 18	
Langeland	6.375	1998	120 mt	2 x 60 mt	Ferat Ucar Kuzey Shipping	Alpha Logistics Services	Feb. 18	
Alsa	4.336	1988	100 mt	2 x 50 mt	Lidmar Shipping & Trading	Flama Maritime Turkey	Feb. 18	
Noma	8.870	2018	110 mt	2 x 55 mt	Volcano Shipping NV	Atlantides Group	Jan. 18	
BBC Thames	17.349	2008	120 mt	3 x 60 mt	Elbe Shipping	Carsten Rehder	Jan. 18	
BBC Rhine	17.330	2008	120 mt	3 x 60 mt	Elbe Shipping	Carsten Rehder	Jan. 18	
BBC Stavanger	7.750	2006	120 mt	2 x 60 mt	Duo Ship BV	Transflot Ltd	Jan. 18	
General Marix	12.205	2003	150 mt	2 x 78 mt	Sealynx Shipmanagement	Weihai Yunhao International	Jan. 18	
Thai Ocean	11.281	1996	122 mt	2 x 61 mt; 2 x 25 mt	East Bright International Ship.	Grand Shipping Ltd.	Jan. 18	

* enbloc deal

FLEET STATISTIC I ALL SHIPS ABOVE 100 TONS COMBIND LIFTING CAPACITY

TOTAL MULTIPURPOSE FLEET FACTS	ABOVE 100 TONS COMBINED LIFTING CAPACITY					
	2017			2018 TO DATE		
	NO.	DWAT	% FLEET	NO.	DWAT	% FLEET
FLEET AS PER 1ST JANUARY	1005	15.105.720		1006	15.332.341	
CHANGES: Deliveries	18	370.318	2,45%	3	35.776	0,23%
Sold For Scrap	16	130.950	0,87%	3	31.097	0,20%
Other Removals/Losses	1	12.747	0,08%			
Net Change During Year	1	226.621	1,50%	0	4.679	0,03%
Fleet End Year / Year to date	1006	15.332.341		1006	15.337.020	
Orderbook	47	736.395	4,80%	44	727.234	4,74%
Laid-up or under long-term repair				11	114.030	0,74%

FLEET ANALYSIS	EXISTING FLEET			ORDERBOOK		
FLEET BY DEADWEIGHT SEGMENTS	NO.	DWAT	% FLEET	NO.	DWAT	% FLEET
2.000 - 4.999 Dwat	61	253.399	1,65%			
5.000 - 9.999 Dwat	277	2.228.370	14,53%	9	68.010	3,05%
10.000 - 14.999 Dwat	291	3.572.569	23,29%	20	260.350	7,29%
15.000 - 19.999 Dwat	135	2.407.641	15,70%	8	152.874	6,35%
20.000 - 24.999 Dwat	54	1.173.732	7,65%			
> 25.000 Dwat	188	5.701.309	37,17%	7	246.000	4,31%

FLEET BY AGE PROFILE	EXISTING FLEET		
	NO.	DWAT	% FLEET
0-5 years	148	3.279.692	21,38%
6 - 10 years	420	6.780.113	44,21%
11 - 15 years	175	2.383.255	15,54%
16 - 20 years	144	1.893.246	12,34%
> 20 years	119	1.000.714	6,52%

FLEET STATISTIC II ALL SHIPS ABOVE 250 TONS COMBIND LIFTING CAPACITY

PREMIUM PROJECT CARRIER (PPC) FLEET FACTS	ABOVE 250 TONS COMBINED LIFTING CAPACITY					
	2017			2018 TO DATE		
	NO.	DWAT	% FLEET	NO.	DWAT	% FLEET
FLEET AS PER 1ST JANUARY	337	5.360.751		339	5.479.396	
CHANGES: Deliveries	8	185.864	3,47%	1	13.230	0,24%
Sold For Scrap	5	54.472	1,02%	2	21.444	0,39%
Other Removals/Losses	1	12.747	0,24%			
Net Change During Year	2	118.645	2,21%	-1	-8.214	-0,15%
Fleet End Year / Year to date	339	5.479.396		338	5.471.182	
Orderbook	32	538.902	9,84%	35	566.724	10,36%
Laid-up or under long-term repair				7	59.597	1,09%

FLEET ANALYSIS	EXISTING FLEET			ORDERBOOK		
FLEET BY DEADWEIGHT SEGMENTS	NO.	DWAT	% FLEET	NO.	DWAT	% FLEET
2.000 - 4.999 Dwat	6	25.200	0,46%			
5.000 - 9.999 Dwat	89	724.795	13,25%	6	51.000	7,04%
10.000 - 14.999 Dwat	110	1.385.440	25,32%	18	236.350	17,06%
15.000 - 19.999 Dwat	55	1.005.753	18,38%	7	135.374	13,46%
20.000 - 24.999 Dwat	6	135.291	2,47%			
> 25.000 Dwat	72	2.194.703	40,11%	4	144.000	6,56%

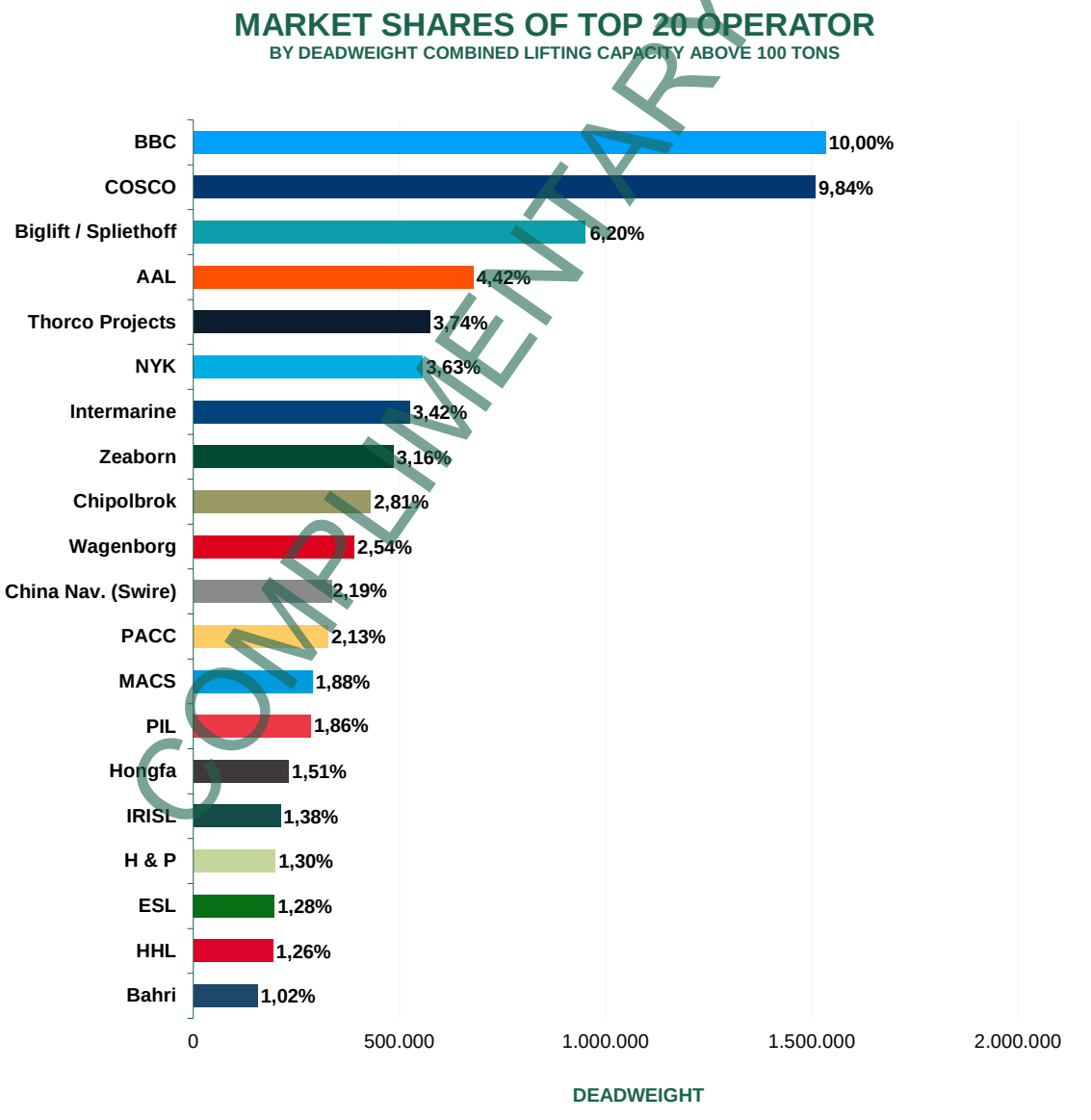
FLEET BY AGE PROFILE	EXISTING FLEET		
	NO.	DWAT	% FLEET
0-5 years	59	1.299.738	23,76%
6 - 10 years	165	2.743.714	50,15%
11 - 15 years	48	661.070	12,08%
16 - 20 years	44	539.402	9,86%
> 20 years	22	227.258	4,15%

INDUSTRY NEWS

While the industry is waiting for further consolidation via acquisitions and mergers, and with previously unconfirmed rumours about changes at **Intermarine** becoming more concentrated, there have been some changes at the level of carrier co-operations.

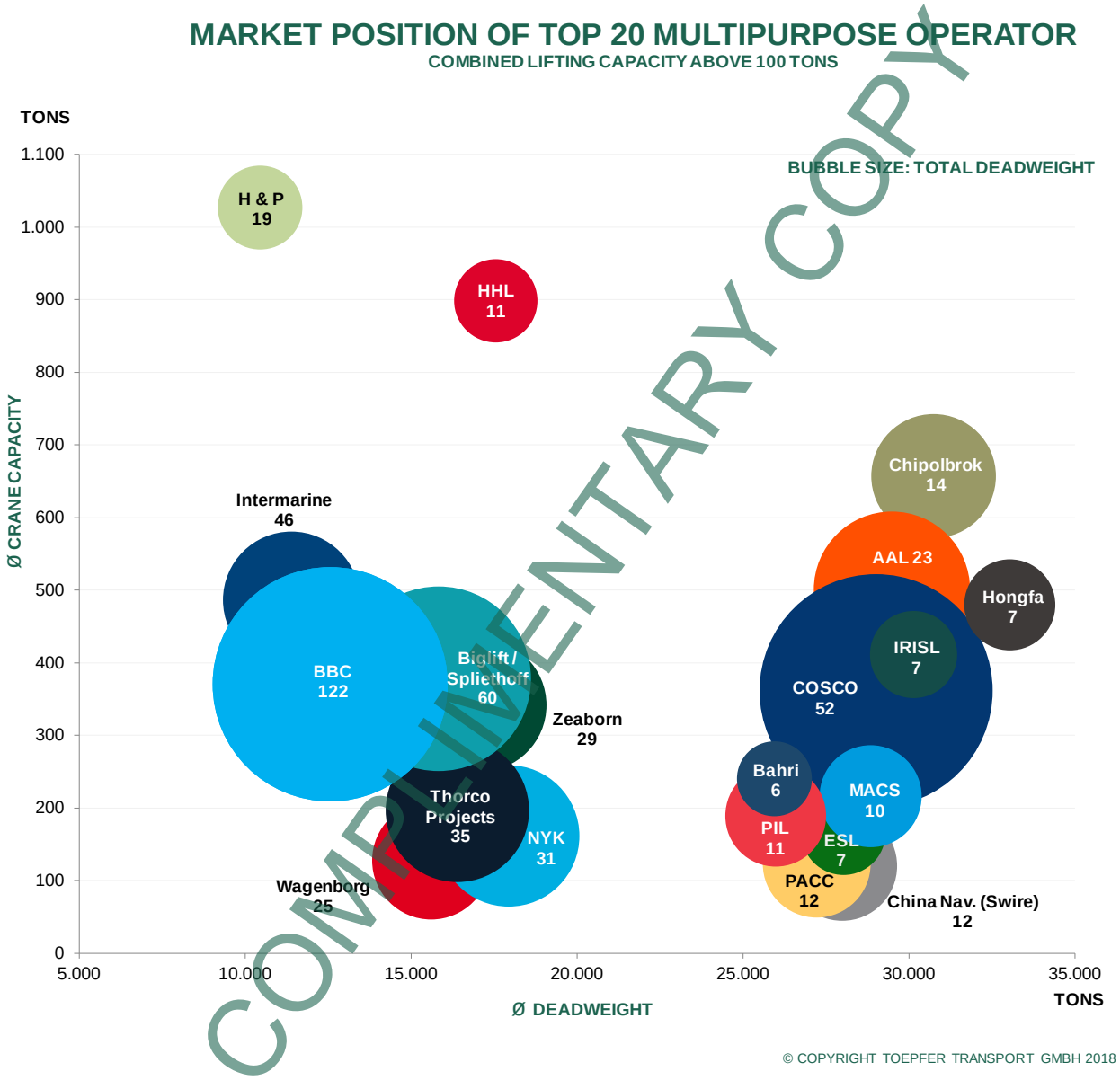
AAL continues to expand its services and now also operates a Europe - Asia service on a regular basis. In addition to the expansion of booking activities in Hamburg, agency contracts were concluded with partners in Spain, France and the Benelux countries.

Also a regular Far East - Middle East service commenced, in cooperation with **Hyundai Merchant Marine (HMM)**, which will bring 4 x 30,000 ton deadweight units, with a lifting capacity of up to 640 tons, into this service. HMM had already developed these units in 2007 with **Rickmers Reederei** and chartered them on a long-term basis. After delivery from the newbuilding shipyard in 2010 - 2011, the ships were already deployed mainly in this trade. HMM expects to gain greater market access from its co-operation with AAL, as AAL is already well positioned, especially in China but also in Europe. Furthermore, AAL has taken additional tonnage into commercial management and also added additional time charter vessels to expand the overall service portfolio and to meet the expected increased cargo volumes.



INDUSTRY NEWS CONTINUED

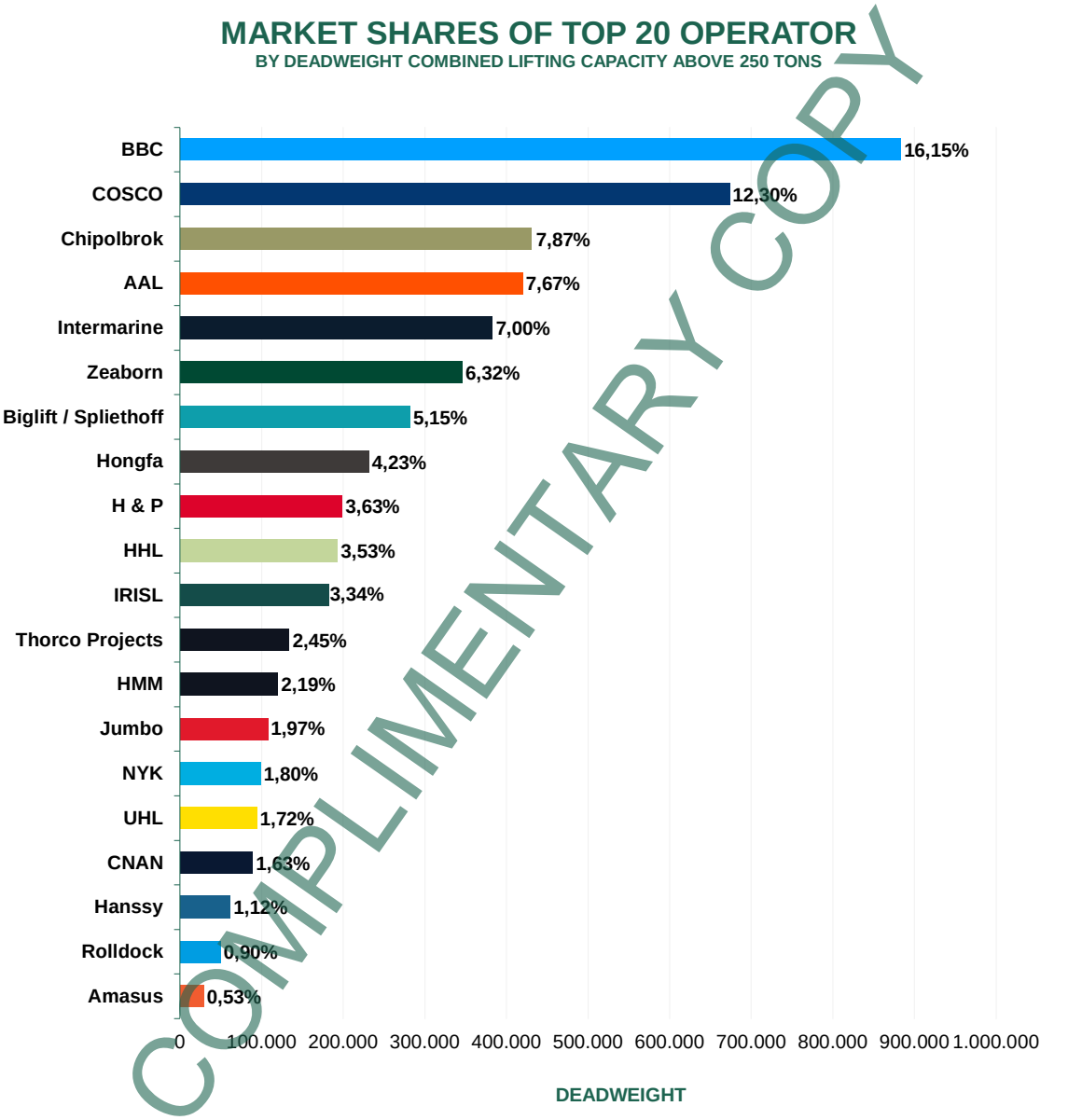
There are also changes in **SAL Heavy Lift**. Following the takeover by **Harren & Partner**, the current market development and enlarged fleet has led to a scheduled regular service from Northern Europe around Africa to the Arabian Gulf and the Indian subcontinent with two departures per month in both directions planned. The focus here will be on the increased demand from the oil and gas business as well as attractive infrastructure projects in West Africa.



Another change is the founding of the first pool for dock vessels, in which SAL Heavy Lift will operate six units together with **Rolldock**. The pool will be managed by Rolldock, while SAL will contribute its expertise for special heavy break bulk cargoes.
For the very special market of dock vessels, pooling may well be a sensible choice and combined with SAL's cargo access, may lead to better utilisation, similar to the recent development of the co-operation between **Jumbo** and **BBC Chartering**.

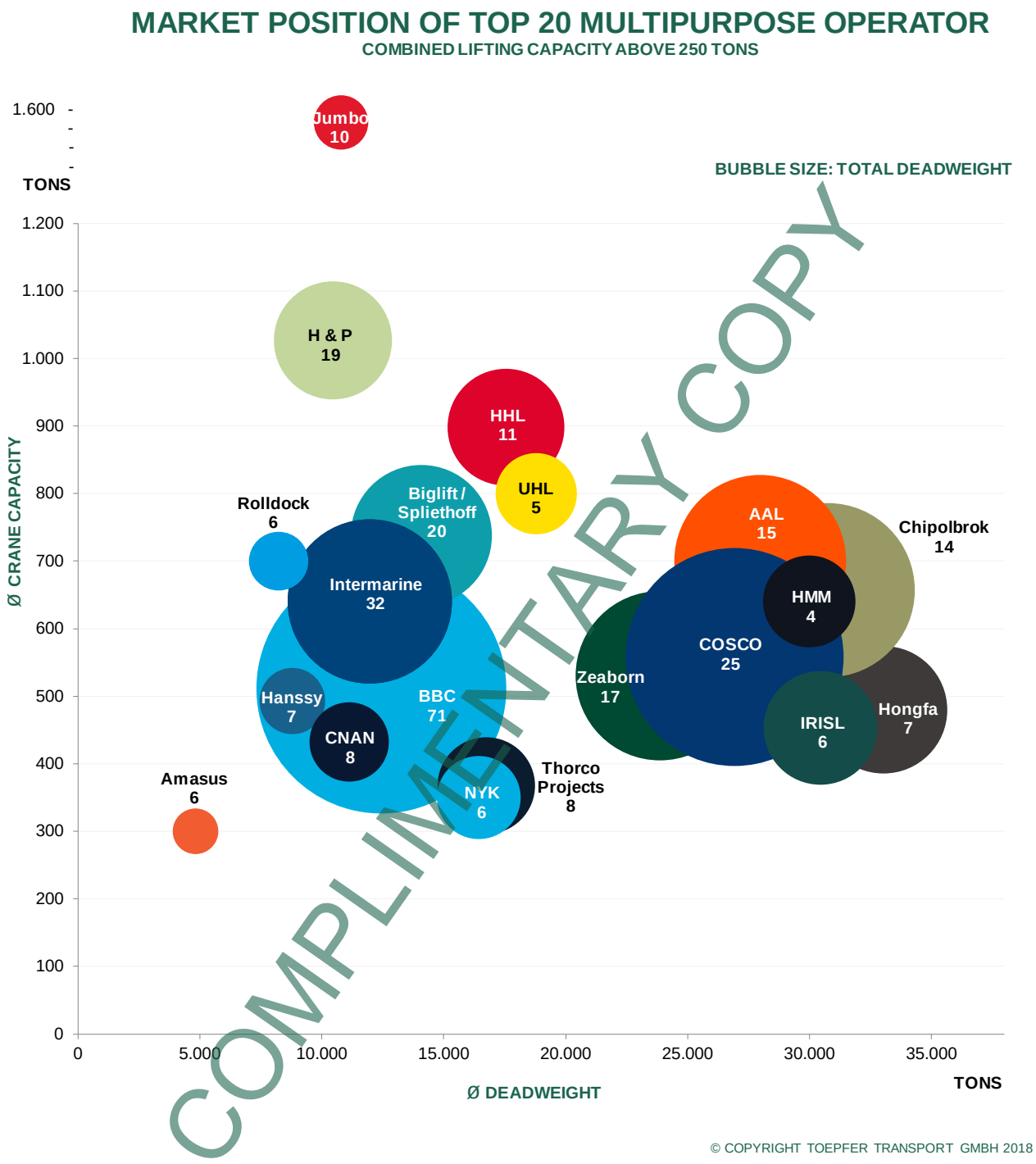
INDUSTRY NEWS CONTINUED

Basically however, pool arrangements are often concluded in an improving market environment. An example here, inter alia, is the **BHS Pool Weser Ems**, which was founded in the 1st quarter of 2014. At the beginning of 2017 eight owners bundled their commercial interests of around 45 ships into this pool, but the pool was terminated at the end of last year, a development which was already foreseeable in the middle of the year… (*see also our MPP Report Issue No. 6*).



The pool agreement between **Thorco Projects** and **MC-Schiffahrt** had a much shorter duration. Officially announced in January 2017, the **MCT Pool** was initially planned for 14 ships with the aim of including additional ships from other owners into the pool. In the end the pool managed only 7 units and was significantly off the originally agreed target. Closure of the pool was therefore decided at the beginning of this year.

INDUSTRY NEWS CONTINUED



In contrast, **Auerbach Schiffahrt** will further expand its cooperation with Thorco Projects. In addition to two time charter agreements (*see also Time Charter Market on page 3*), it was agreed between the parties that Auerbach would take over the technical management of five Thorco ships in the future.

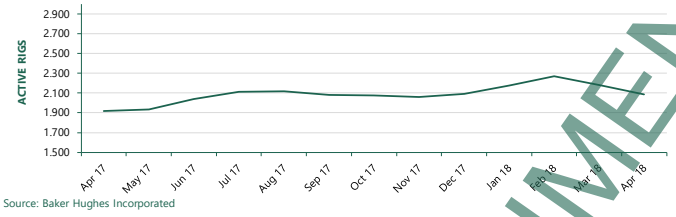
Elbe Shipping Reederei from Drochtersen / Germany will no longer participate in the market. Following the sale of the last two units managed by Elbe Shipping to **Carsten Rehder**, operations ceased and another vessel provider of MPP / HL tonnage left the market. For Carsten Rehder, who has focused mainly on container and bulk vessels in recent years, the two new additions are the first units to follow a long abstinence in this segment.

CARGO DEMAND CHARTS

PARKER BAY'S SURFACE MINING EQUIPMENT INDEX

BASED ON VALUE OF SHIPMENTS BY QUARTER IN CONSTANT $'s; 1Q 2007 = 100

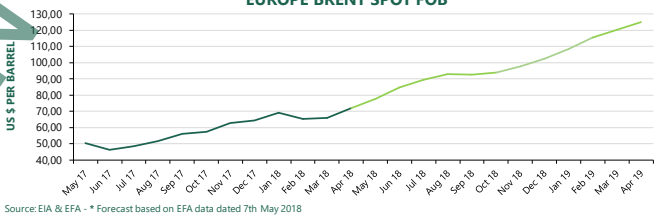
MONTHLY GLOBAL RIG COUNT



Source: Baker Hughes Incorporated

MONTHLY OIL PRICE DEVELOPMENT & FORECAST *

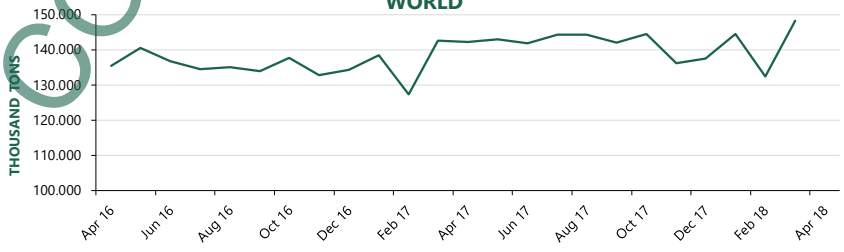
EUROPE BRENT SPOT FOB



Source: EIA & EFA - * Forecast based on EFA data dated 7th May 2018

MONTHLY CRUDE STEEL PRODUCTION

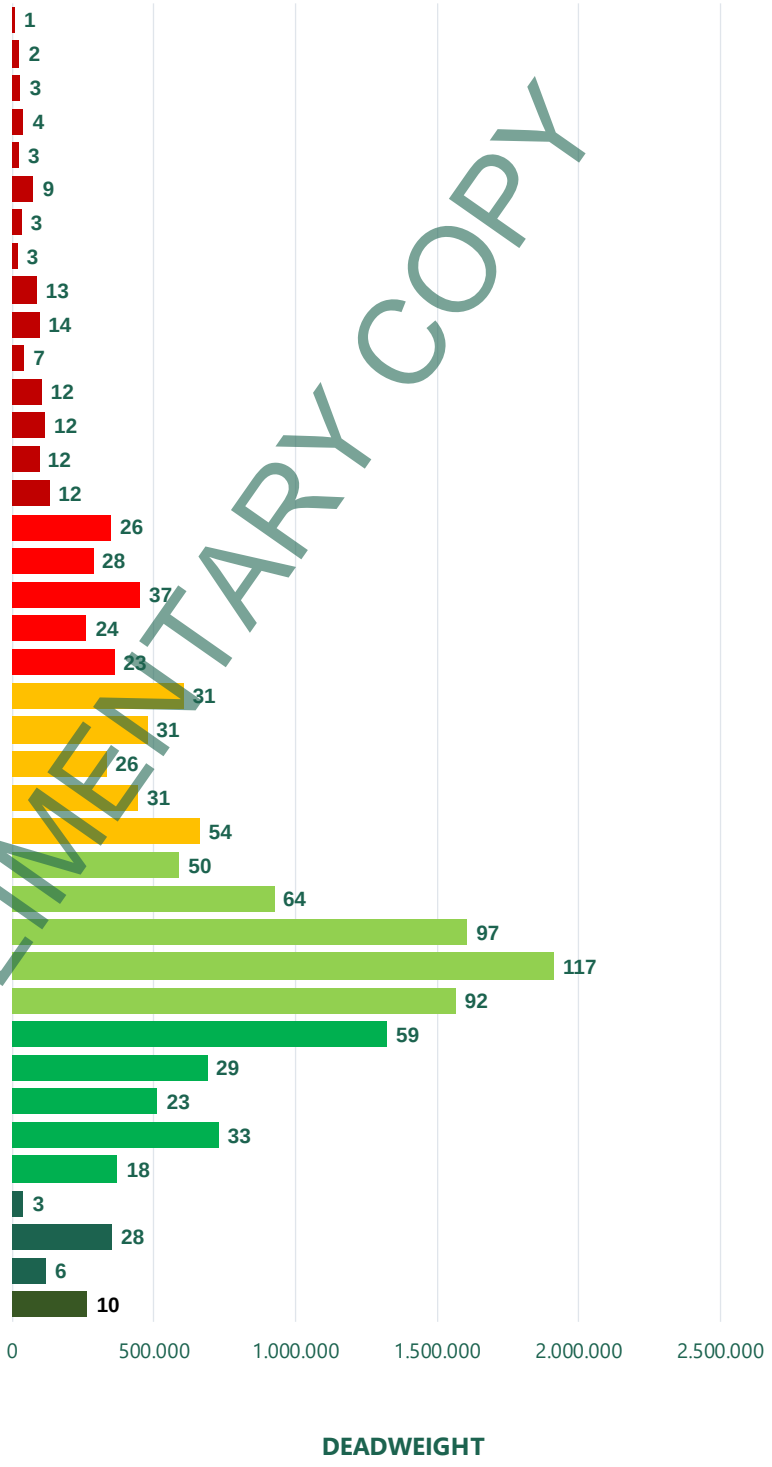
WORLD



Source: Worldsteel Association

FLEET AGE BREAKDOWN ALL SHIPS ABOVE 100 TONS COMBINED

BUILT	AGE	UNITS	DEADWEIGHT
1983	35	1	5.902
1984	34	2	21.778
1985	33	3	25.173
1986	32	4	36.459
1987	31	3	19.351
1988	30	9	71.152
1989	29	3	28.851
1990	28	3	15.354
1991	27	13	84.830
1992	26	14	93.676
1993	25	7	38.949
1994	24	12	102.140
1995	23	12	114.498
1996	22	12	92.313
1997	21	12	129.931
1998	20	26	346.958
1999	19	28	284.001
2000	18	37	449.398
2001	17	24	260.831
2002	16	23	358.744
2003	15	31	603.192
2004	14	31	475.844
2005	13	26	330.624
2006	12	31	442.874
2007	11	54	660.326
2008	10	50	588.907
2009	9	64	922.155
2010	8	97	1.604.848
2011	7	117	1.911.078
2012	6	92	1.563.998
2013	5	59	1.321.549
2014	4	29	686.337
2015	3	23	511.537
2016	2	33	727.367
2017	1	18	370.318
2018	0	3	35.776
2018	**0**	**28**	**351.094**
2019	**0**	**6**	**115.140**
2020	**0**	**10**	**261.000**



QUARTERLY FOCUS

The only constant is change…

…this wisdom is said to have been uncovered by the Greek philosopher Heraclitus some 2500 years ago. Change itself can certainly be quite positive, considering for example, how living conditions for millions of people in the last 200 years have largely and significantly improved as a result of industrialisation.

Starting from England at the end of the 18th century, industrialisation continued to expand and accelerate. In Germany, however, industrialisation began somewhat later, since at that time it still consisted of many small individual states and goods could not be transported so easily from one place to another. This changed with the introduction of the customs union of 1834 and the associated abolition of customs borders. This allowed a uniform economic area to develop within which industrialisation could also spread.

The effects of the consequences of industrialisation on people at that time can only be guessed at. In addition to the expansion of the railway, which served as a catalyst for the industrial revolution, the development of the automobile at the end of the 19th century changed the streetscapes of many European and North American cities. Working conditions in the factories and living conditions in the cities were also transformed.

If one looks at current developments that have been advancing ever more rapidly since the end of the 20th century, the industrial revolution seems to be a leisurely change compared to the now occurring digital revolution. This digital revolution was made possible by the development of the integrated circuit (microchip), which among other things enabled the introduction of flexible automation in production and the construction of the Internet.
Initially the demand for small, lightweight integrated control technology came in the 1950s and 1960s from the military and aerospace industries to control large payload rockets. In the wake of the global growth crisis of the 1970s this resulted in an opportunity for labour-saving and capital-saving flexible control technologies in machine tools and other civil applications.

A commercial breakthrough was the provision of affordable standard software for office applications in the 1980s. In ever shorter intervals, this was then followed by the Global Positioning System (GPS), the compact disc, the mobile phone, robots, the digital camera, digital television, RFID, drones and the autonomous driving of vehicles.

As early as 1965 Gordon Moore's Law formulated a substantial legitimacy for this development. It states that the complexity of integrated circuits regularly doubles with minimal component costs; in real terms, the performance of new computer chips doubles on average approximately every 20 months.

The effects of this development on the economy and the world of work can now be clearly felt in all areas. But also for society and the individual; for example, the omnipresence of the smartphone leaves its mark.

The consequences of all this for shipping and especially for general cargo and heavy lift shipping can perhaps be deduced from the following considerations. A further concomitant of the digital revolution is the development of 3D printing, which, in addition to the production of models and prototypes, is already being used in serial production in the aerospace industry, for medical and dental technology and the packaging industry.

But 3D printing technology is already also being used in mass production. Adidas has just commissioned its second "Speed Factory", which is now producing in the USA as well as in Germany. Overall, Adidas intends to produce around 1 million shoes per year at both locations by 2020, compared to a total output of 806 million shoes in 2017, which still makes this a very small share.

The potential of this development, however, can be clearly illustrated by shoe production. Adidas' 806 million

QUARTERLY FOCUS CONTINUED

shoes fill around 115,000 TEU. But Nike, Puma, New Balance and Under Armor are also working on the introduction of 3D production lines that will entail a shift of parts of the production process.
In addition, if one now takes other products such as household items, toys or products of daily use, some of which are even easier to produce than shoes and which are traditionally produced in low-wage countries, one can easily see the potential impact this development will have on container shipping.

On the other hand, 3D printers also require raw materials to produce the desired products. These in turn must also be produced and transported, so that the bottom line is that there will at least be shifts in overall product flows and types.

Significant and serious consequences, however, will result from the rapid pace of digitisation and automation of work itself. In the words of US economist Jeremy Rifkin, in the long term the digital revolution will make work disappear. "We are in the midst of a revolution that surpasses the industrial revolution. Millions of people lost their jobs as a result of the first mechanisation spurts and migrated from the countryside to the cities to work with machines. But today's computers and information technology are making more and more people redundant. Even the cheapest manpower is more expensive than the machine." Rifkin said in an interview back in 2005.

Add to these developments global population growth, which has more than doubled in the last 50 years to the current 7.6 billion and, according to a mean forecast of the United Nations will again increase by about 25% in the next 25 years, making the most urgent question for the future that of what people will do and how they will earn their living.
However, this perhaps somewhat philosophical question acquires a concrete relevance in many areas when considering basic human needs. In the search for work, people will continue to flock to megacities that are growing and will continue to expand their infrastructure for electricity, water, heating and transportation. In all likelihood there will also be a growing demand for suitable heavy lift shipping space, which will provide a variety of components for a functioning and growing infrastructure.

To what extent current developments in the field of autonomous driving and the initial attempts to transfer this to the shipping industry can be implemented, depends not only on various technical challenges, but also on a legal basis to be defined when it comes to liability in the event of accidents or the failure of control-relevant components.

In general, it is quite conceivable that fully automated transport units can be used for homogeneous types of cargo such as containers, bulk and liquids on certain main routes, whereby the respective infrastructure has to be adapted to this new development at each loading and discharging port. To an extent this already works successfully, as can be seen at the Container Terminal Altenwerder, the world's first almost fully automated container terminal. The steps to complete automation are getting shorter, at least in container shipping.

In 2019, for example, the first autonomous container ship, *Yara Birkeland*, is to be launched, and after a test phase from 2020 onwards, it will start its regular service on the Norwegian coast without any crew. Another parallel development is currently being tested by Wärtsilä: the automated docking system. That the Norwegians are the first to use an autonomous ship does not come as a surprise. Since 2013, for example, there has been a state-sponsored "Centre for Autonomous Marine Operations and Systems" at the country's most important technical university, virtually a Silicon Valley of shipping. In addition, the Norwegian authorities have identified three offshore autonomous vessel test sites available to science and industry for testing.

Technically, this would mean closing the gap for a completely automated transport chain and it is only a matter of time before it is established in the global environment. For ship owners, ship managers and investors, the future will be not only to ask when is the right time to rely on this new technology in order to remain part of the value chain, but also operators and carriers will have to face this new challenge if they are not willing to leave the field to Amazon, Google, Uber & Co.

QUARTERLY FOCUS CONTINUED

In addition to automation, the propulsion engine of future transport units will be decisive, and here the classic marine diesel is certainly a discontinued model. The *Yara Birkeland* will be powered by an electric motor; whether this technology will prevail on a large scale depends on the development of batteries or storage and how they can be changed and charged.

In the foreseeable future this development will only have limited effects for general cargo and heavy lift shipping since the type of cargo is not standardised and often requires special care during transport. Furthermore, regions, ports and terminals are called at which are not suitable for complete automation because of their location and/or the kind of cargo being turned over. However, implementation lies in already partially-existing automation, be it in navigation or in the use of cranes for complex loading and discharging operations.

In the commercial sector, online platforms will map and take over booking processes for many kinds of cargoes at least. Here, blockchain technology will play a significant role in rendering the various areas of the logistics process transparent, comprehensible, faster and above all cost-neutral.

Also for freight rate development and pricing there will be a form of automated freight exchange for breakbulk and heavy lift shipments on which the shippers offer their cargoes and then the carriers can offer their existing space or vice versa. Individual pricing will then only take place for highly specialised project cargos, for which only a very limited number of carriers come into question.

A similar development will also occur in the sale and purchase of tonnage, which can be handled via fully transparent online platforms. The same applies to time charter market tonnage, which can be standardised in the same way. For many brokers, booking agents and also employees of shipping companies and carriers, this development will initially run parallel, but in the medium term will lead to the abolition of their working basis, as well as the redundancy of a large number of the people currently involved in the logistics process.

These types of changes in the world of work have been in process since the late eighteenth century and so are not new; what is new is the speed and penetration of all work processes within a few years, which leads to a fundamentally new situation and the question of what are the majority of people to do if all work processes are automated and AI has taken on the work factor?

The answer to this question will certainly become increasingly urgent and must be found in the foreseeable future. In the meantime it remains exciting to see which companies will withstand these developments and in what form and also how far the digital revolution with all its changes will affect the multipurpose heavy lift shipping segment.

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TOEPFER TRANSPORT GMBH

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