

# Shipping ECA finance

2018 edition

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In this issue:

- Cruise ship boom carries all before it
- European ECAs crowd out Asian players, who continue to cover more sectors
- Thin volumes for FPSOs and LNG vessels - but huge potential



### Foreword: Allen & Overy

Welcome to the 2018 shipping export credit agency (ECA) finance report, produced by TXF Data with the support of Allen & Overy LLP. This is the latest in a series of sector specific reports, and examines financing trends in the ECA supported shipping and offshore sectors with a particular focus on overall trends and trends in regions and sub-sectors.

The years since the onset of the financial crisis in 2008 have revealed just how diverse shipping is, with different market segments performing very differently in response to global events. Now more than ever, financing shipping and offshore vessels requires considerable expertise and market knowledge.

Some sectors of the shipping market, have remained in the doldrums since the financial crisis, with shipyards having over-produced, ship owners having over-ordered and lenders having lent too much. The assumption that there would be an ever-increasing amount of goods to ship has been proved painfully wrong, with certain shipping sectors struggling to return to something resembling "normal" profitability. Other sectors have demonstrated greater resilience and are now steaming ahead; for shipping companies in these sectors the tide is definitely rising.

In this report we will look at the importance of ECA supported finance in three key market sectors: cruise ships, floating production storage and offloading units (FPSOs) and liquefied natural gas (LNG) carriers.

Demand for ECA supported finance is often counter-cyclical; it becomes popular when financiers are more reluctant to lend because risks appear too great and in transactions where the required financing amount outstrips the available commercial bank liquidity. In shipbuilding it is also used by states to give their shipbuilding industries a competitive edge. This report focuses on the three sectors referenced above, in part, because these vessels are often more expensive than traditional container, bulk carrier and tanker vessels. In these circumstances, the backing of an ECA can make deals much more bankable for financiers and more affordable for owners and sponsors.

We hope that you find the insights into the risks and opportunities in the markets that we are exploring in this report useful.

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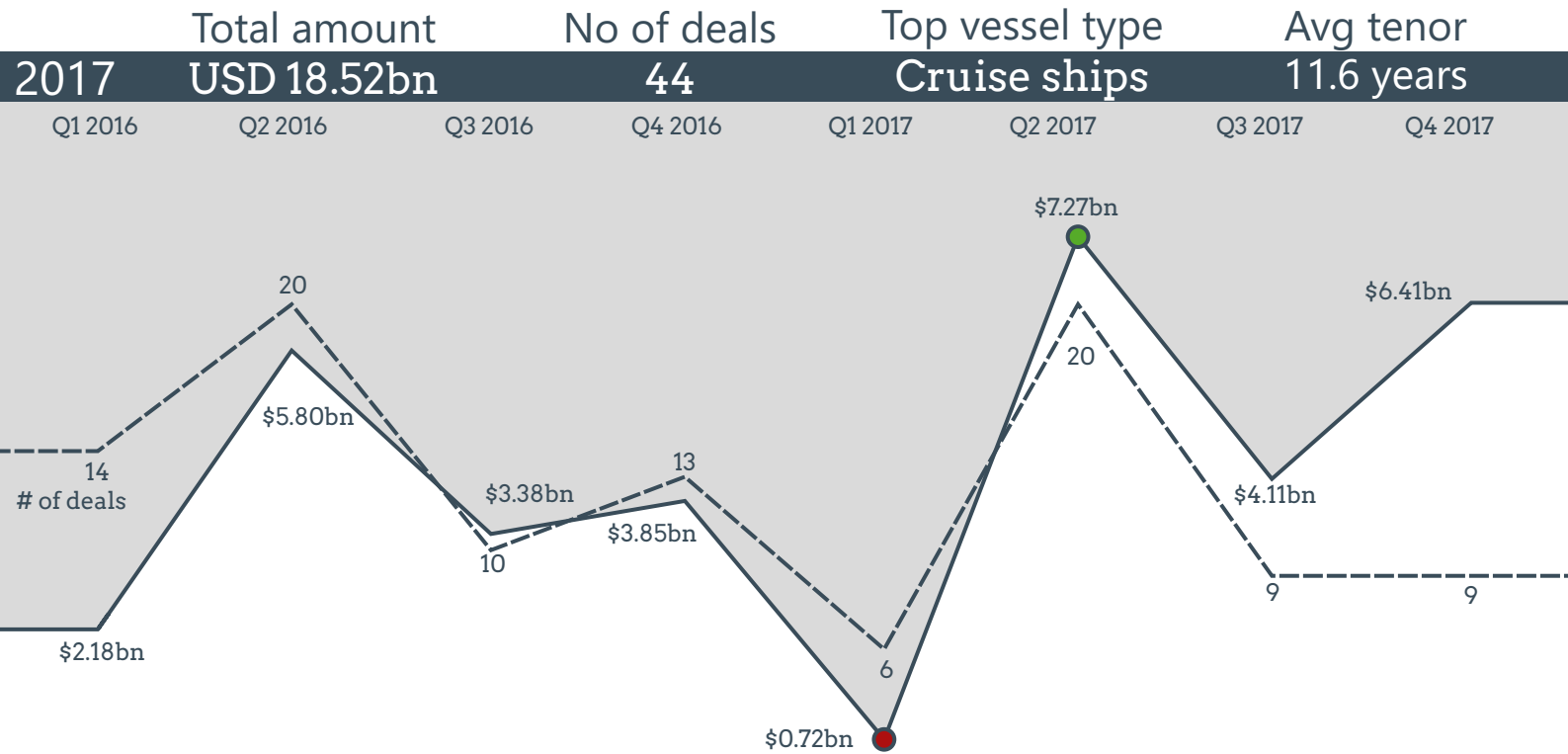
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# Shipping ECA finance 2018

## Market at a glance

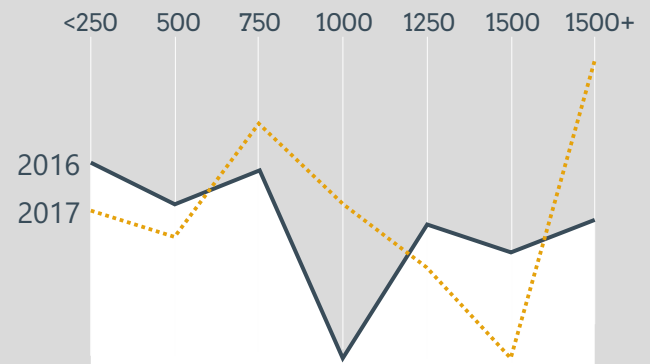
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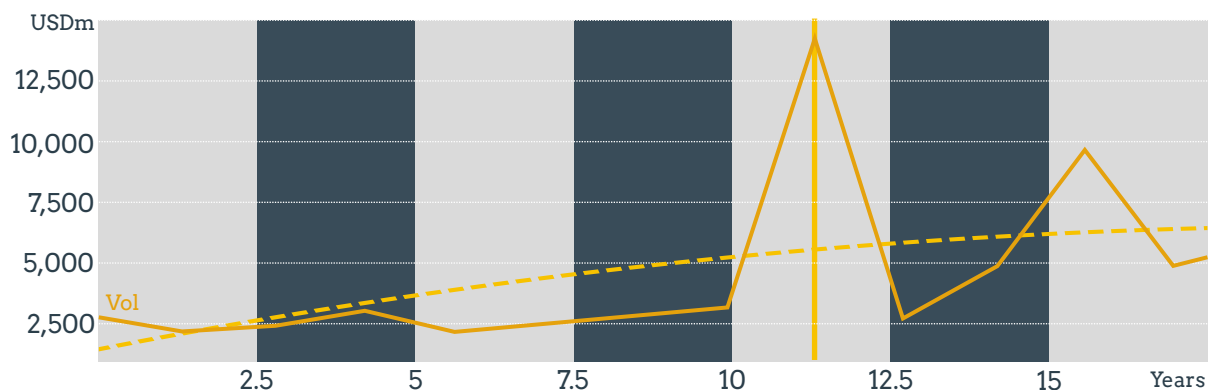
### Deals by volume

#### Breakdown by volume range

Range (USDm)	2016		2017	
	USDm	No	USDm	No
1-250	3,573	40	2,410	25
251-500	2,564	7	1,805	5
501-750	3,388	6	4,519	7
751-1000	-	-	2,580	3
1000-1250	2,087	2	1,057	1
1251-1500	1,433	1	-	-
>1500	2,181	1	6,151	3



### TENOR vs. AMOUNT TRENDLINE



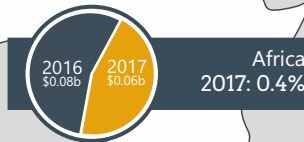
Find the methodology at: [www.txfdata.com/methodology](http://www.txfdata.com/methodology)



Top Region  
**North America**

Amount  
**\$12.9bn**

No of deals  
**13**



## Analysis

The global ECA supported shipping and offshore finance markets improved markedly in 2017 – and did not need oil & gas to give them a boost. They shrugged off a lacklustre first quarter to post a record \$7.27 billion in volumes in the second quarter, following that with third and fourth quarters that surpassed their equivalents in 2016.

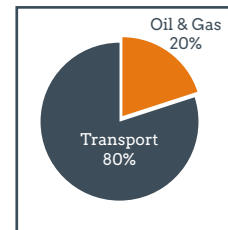
A small number of very big deals made all the difference. Three of the four deals of larger than \$1.5 billion to close in the last two years closed in 2017. Fewer deals closed in 2017 than 2016, but over two-thirds of the haul in 2016 comprised deals of smaller than \$250 million.

TXF's data also indicates that, during an unsettled time in shipping, ECAs give operators crucial access to long term financing. Comparatively small numbers of ECA-backed deals of under ten years closed in either 2016 or 2017. Big spikes appear at about 11 years, and again at 15.5 years.

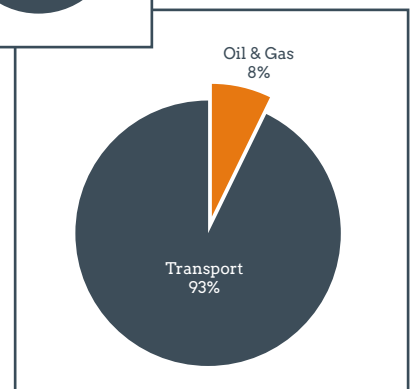
The main reason for the rude health of the global ECA-backed shipping finance market is the soundness of the cruise ship market. The ten largest financings to close over the last two years were all for cruise ships. The U.S. presence of the major cruise lines means that the US accounts for over two-thirds of 2017's volumes. Only Europe, with a mixture of cruise and oil & gas financings, and Asia-Pacific, with some oil & gas vessel deals, registered anything more than negligible levels of activity.

### Deals by sector

2016



2017



### Borrowers and ship types

Royal Caribbean accounted for just under a third of 2017's total ship finance activity, and closed three of the four largest deals of the last two years. Their competition entirely consisted of cruise lines, with Norwegian, Carnival, MSC and Disney rounding out the top five borrowers.

The sixth-largest borrower, offshore oil and gas drilling contractor Seadrill, closed less than 10% of Royal Caribbean's volumes. Two tanker operators, Teekay and BW, ranked eighth and tenth, Saga Cruises came in seventh, and a single container operator, CMB, came in at ninth. Given the well-publicised bankruptcy of Korean container operator Hanjin, CMB's placing was doubly impressive.

Cruise ships' dominance was so complete that their combined 2016 and 2017 volumes were larger than 2017's total volumes. Even combining all financings over the last two years for all tanker types and offshore services vessels produced total volumes of less than a quarter of what cruise produced over the same period. Ferry and dry bulk volumes were both negligible.

These numbers highlight what has already been apparent to coverage bankers: ECA resources are focused disproportionately towards exports of high value-added goods like cruise ships to wealthy markets in the U.S. and Europe. Offshore oil and gas fits this bill as well, but cruise ships fit it even better.

Top borrowers			2017
	2016	2017	
Royal Caribbean Cruises	1,433	6,151	
Norwegian Cruise Line	906	3,087	
Carnival Corporation	2,287	2,580	
MSC Mediterranean	455	1,432	
Disney Cruise Line	-	1,057	
Seadrill	-	483	
Saga Cruises	-	387	
Teekay	-	327	
CMB Financial Leasing	-	318	
BW LPG	221	290	

Deals by type of ship	2016		2017	
	No of deals	Vol (\$m)	No of deals	Vol (\$m)
Cruise ship	12	9,654	18	15,123
Gas tanker	3	477	4	1,008
Offshore	9	772	6	641
Oil tanker	6	1,069	3	265
Product tanker	1	573	1	227
Ferry	2	44	2	90
Dry bulk	1	14	2	89
Other	18	2,112	8	1,078

### Lenders and guarantors

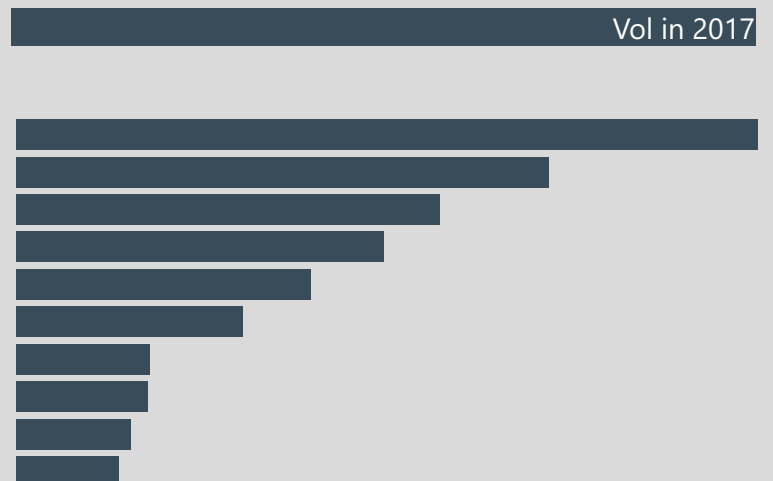
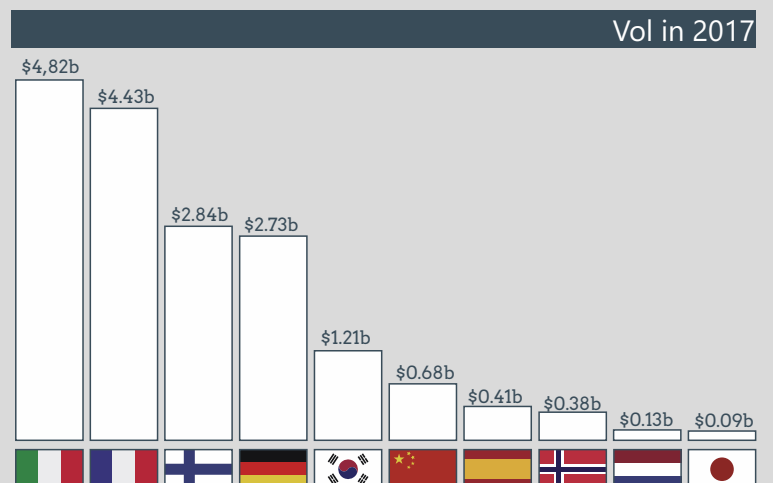
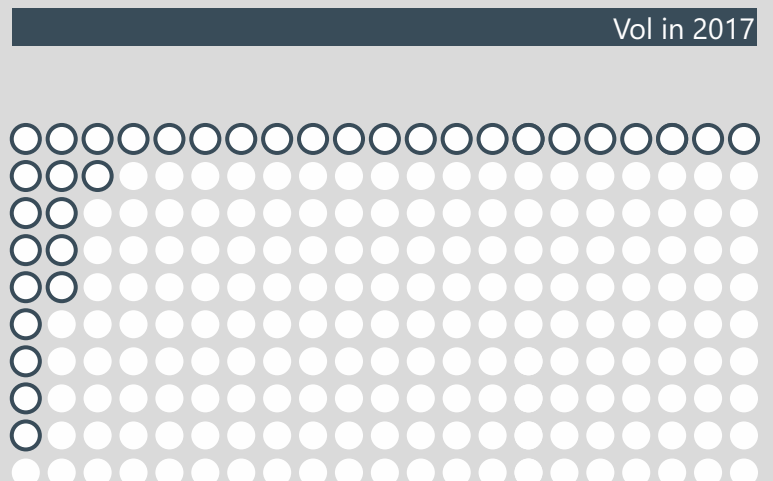
To be an attractive destination for ECA financing, countries need either a wealthy population (e.g. the U.S. and its cruise market), an offshore oil services industry (e.g. the UK and Singapore) or to offer advantages in terms of registration (e.g. the Marshall Islands and Panama). The U.S. accounted for 69.5% of total volumes in 2017, and only two other countries — one of them landlocked — accounted for more than 3%. Only five of 2016's busiest countries reappeared in 2017. The dominance of the U.S. aside, shipping finance activity can be unpredictable.

The competition between exporters was slightly less lopsided, but Italy, whose ECA SACE was active in support of powerhouse shipyard Fincantieri, won out convincingly in 2016 and solidly in 2017. France, whose ECA Bpifrance stood behind the STX yard, came out second, while Finland, whose Finnvera backed a single financing for a Meyer Turku cruise order, came in third.

Top ten countries by country of the Borrower					
		2016		2017	
		\$m	%	\$m	%
1	United States	7,031	46.2%	12,876	69.5%
2	Switzerland	455	3.0%	1,432	7.7%
3	Singapore	411	2.7%	774	4.2%
4	Marshall Islands	672	4.4%	554	3.0%
5	United Kingdom	203	1.3%	515	2.8%
6	Hungary	-	0.0%	483	2.6%
7	Spain	-	0.0%	441	2.4%
8	Philippines	-	0.0%	401	2.2%
9	Germany	-	0.0%	247	1.3%
10	Hong Kong	-	0.0%	200	1.1%

Top ten countries by country of the ECA					
		2016		2017	
		\$m	%	\$m	%
1	Italy	5,374	37.4%	4,827	27.1%
2	France	1,888	13.1%	4,433	24.9%
3	Finland	0	0.0%	2,843	15.9%
4	Germany	2,108	14.7%	2,734	15.3%
5	South Korea	2,483	17.3%	1,212	6.8%
6	China	654	4.5%	682	3.8%
7	Spain	34	0.2%	441	2.5%
8	Norway	940	6.5%	385	2.2%
9	Netherlands	715	5.0%	134	0.8%
10	Japan	133	0.9%	92	0.5%

Top lenders on ECA-supported deals					
		2016		2017	
		\$m	%	\$m	%
1	BNP Paribas	1,917	16.5%	3,056	19.9%
2	HSBC	1,044	9.0%	2,197	14.3%
3	KfW IPEX	586	5.0%	1,742	11.4%
4	Santander Bank	662	5.7%	1,512	9.9%
5	Société Générale	517	4.4%	1,214	7.9%
6	SMBC	886	7.6%	937	6.1%
7	Citi	556	4.8%	559	3.6%
8	Credit Agricole	787	6.8%	547	3.6%
9	Commerzbank	3	0.0%	470	3.1%
10	BayernLB	329	2.8%	422	2.8%



# Cruise Ship Market

## OPINION

### Key risks

Financing any ship requires a skilful assessment of the ship, the ship owner and the market in which the ship is trading. With cargo ships the earnings are, in theory, relatively predictable if there is a long-term charter in place. There are also published indices and well-developed spot markets for most types of cargo ship. The lenders can look at the numbers, work out if a ship is bankable and take security over the earnings.

Cruise ships are different. They do not simply move goods from A to B, reliant only on there being a regular demand for those goods in B. Cruise operators are selling an experience; passengers do not need to go anywhere in particular, but they do need to be kept happy, and happiness is much harder to ship than iron ore. Losing a few containers overboard from a container ship on a rough voyage is not an uncommon event and does not prevent people shipping goods by container. The same could not be said for cruise passengers. The reputation of the operator and the ship is paramount to its future success.

The cruise voyage itself brings commercial risks that operators have to deal with – consider, for example, that the cost of the Costa Concordia disaster is estimated at over \$2 billion. The recent difficulties faced by air operators flying to package holiday destinations in North Africa caused by a collapse in the numbers of tourists wanting to visit serves as a reminder that once-popular holiday destinations can become no-go areas. Also, environmental concerns are increasingly being raised by some popular cruise destinations, as a result of the impact that a visit from a large cruise ship can have on the local environment. The concerns relate to both passenger numbers and air pollution. If popular destinations limit the size of cruise ships or require them to clean up their emissions, this could adversely affect the profitability of some ships. It is also harder for financiers to take security over the cash flows that cruising generates as these are the result of thousands of individual payments rather than a monthly payment of charter hire. It is not surprising that these factors and the very high cost of building cruise ships means that ship owners and financiers often turn to ECAs for support as a method of supporting financing for these ships.

### Key opportunities

Cruising is clearly a growth market. The key players are large often well rated businesses with strong brands. The cruise operators' intentions of building a virtuous circle of loyal returning customers who start with a family fun cruise and then mature into cultural or nature cruises and end with more leisure trips seems to be borne out by the rising passenger numbers, particularly in the younger age groups. If operators can grapple with the environmental and terrorist issues and maintain passenger interest, ageing populations and the increasing affluence of countries like China will present huge opportunities.

ECA finance is likely to remain important for this sector because of the high cost of fitting out and maintaining the ships, a difficult secondary market in cruise ships and the practical difficulties of using the cash flows as security. The ECAs in the main cruise ship building countries will also be keen to preserve their national industries as competition from other countries will inevitably grow.

Current and future cruise ships will also need to comply with increasingly strict environmental regulation, and the cost of retrofitting these ships with cleaner engines and more advanced clean power systems may also present opportunities for financiers. This has been shown with cruise operators turning to LNG as a fuel and this is a trend which is set to continue in cruise and other shipping sectors.

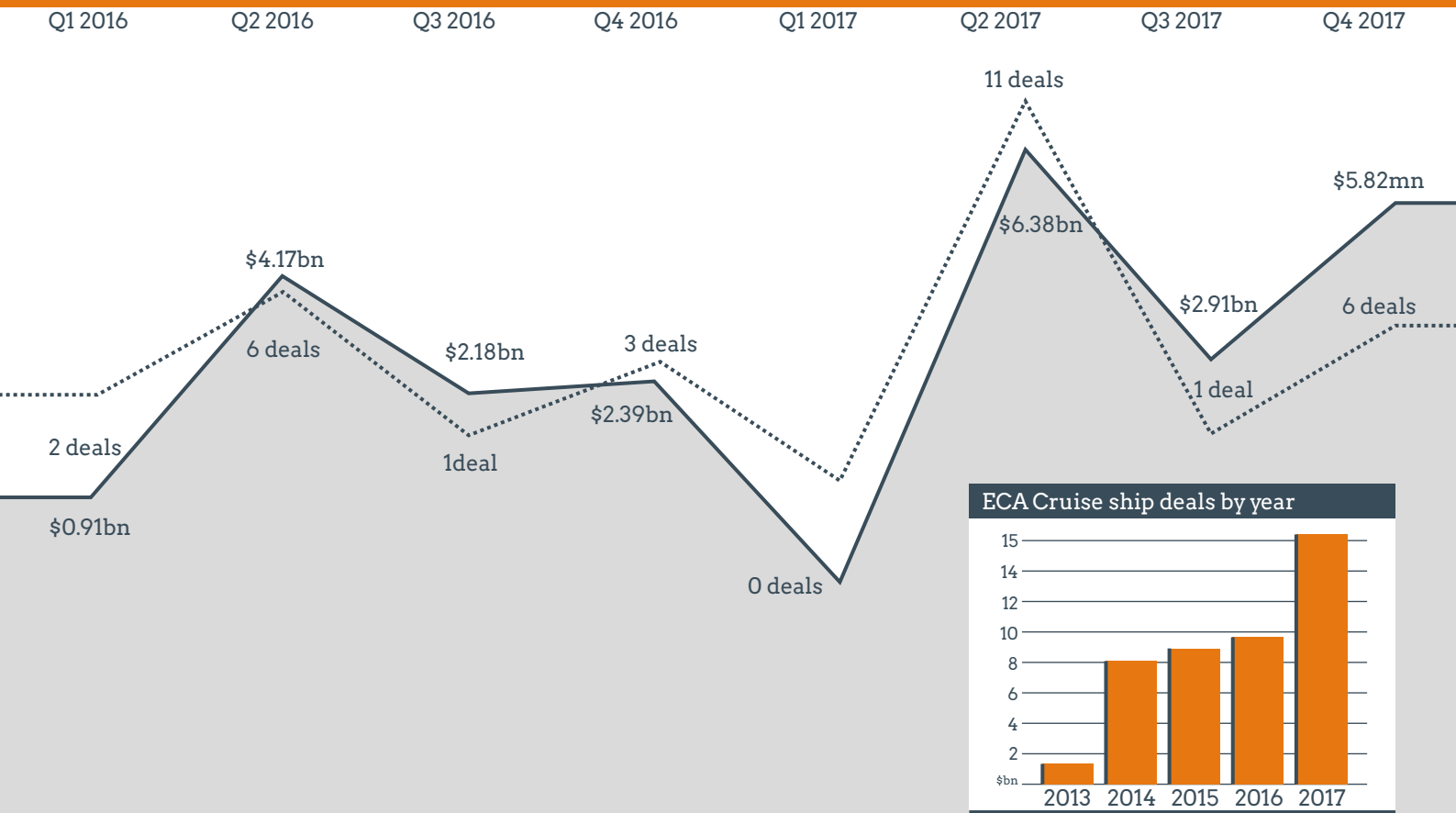
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# Shipping ECA finance 2018

## Cruise ship market

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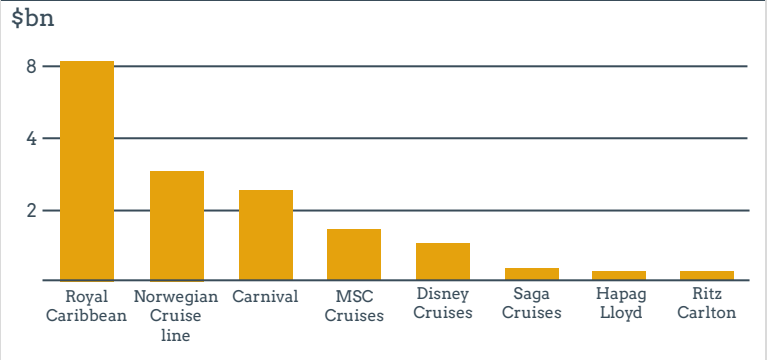


### Cruise market top borrowers & exporters

#### Top borrowers for cruise ships

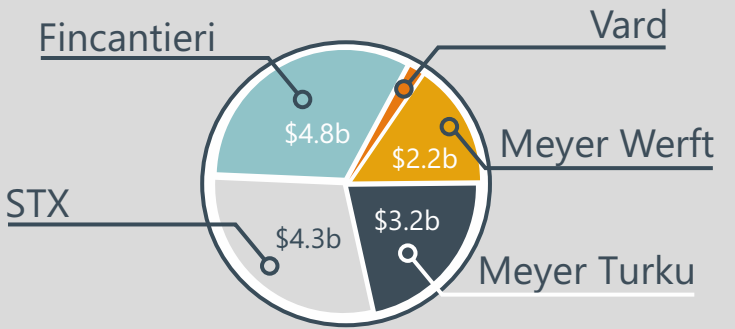
		2016 (\$m)	2017 (\$m)
1	Royal Caribbean	1,433	6,151
2	Norwegian Cruise Line	906	3,087
3	Carnival Corporation	2,287	2,580
4	MSC Cruises	455	1,432
5	Disney Cruises	2,087	1,057
6	Saga Cruises	-	387
7	Hapag Lloyd	-	247
8	Ritz Carlton	-	182
9	Virgin	2,181	-
10	Compagnie Du Ponant	305	-

#### Top borrowers 2017



#### Top exporters for cruise ships

		2016 (\$m)	2017 (\$m)
1	Fincantieri	5,374	4,827
2	STX	1,433	4,351
3	Meyer Turku	-	3,232
4	Meyer Werft	2,087	2,285
5	Vard	305	247



The largest cruise operators cemented their spots in 2017. Virgin and Compagnie de Ponant did not feature in 2017, while Norwegian, Royal Caribbean and Carnival appeared in both years, with Norwegian and Royal Caribbean registering higher volumes in 2017 than 2016. Of the top four, MSC alone appeared in 2017 but not 2016. Royal Caribbean's \$3.2 billion financing through Euler Hermes/Finnvera, and \$2.9 billion Bpifrance deal together accounted for over a quarter of 2017's volumes.

The second Royal Caribbean financing allowed Bpifrance, which took over Coface's role in supporting French exports in 2017, to increase French ECA activity from fourth place to first. SACE experienced a fall in the volumes of financing it supported in 2017, while Euler Hermes' volumes were a little higher. Norway's GIEK and EKN, which have stronger franchises in oil & gas, both posted small cruise volumes in 2017.

The overwhelming importance of the U.S. market in 2017, as well as the strengthening of the Euro against the dollar, may have contributed to the much greater share of financing volumes denominated in U.S. dollars in 2017. However, USD dominance remains largely driven by dollar denominated contract prices from the yards, other than for certain cruise ships where European yards can negotiate Euro contract prices. It made little difference to the types of lenders participating in ECA deals. Their rankings essentially mirror the overall lender standings, though Société Générale slips slightly, and of the Asian lenders only SMBC remains.

### Currency breakdown in the ECA market

#### Top currencies

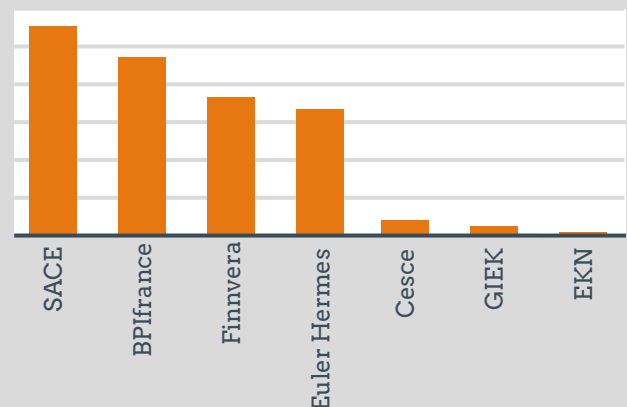
		2016 (\$m)	2017 (\$m)
1	U.S. Dollar	2,121	9,802
2	EUR	5,446	4,934



### Top ECAs in the Cruise market

#### ECAs by volume

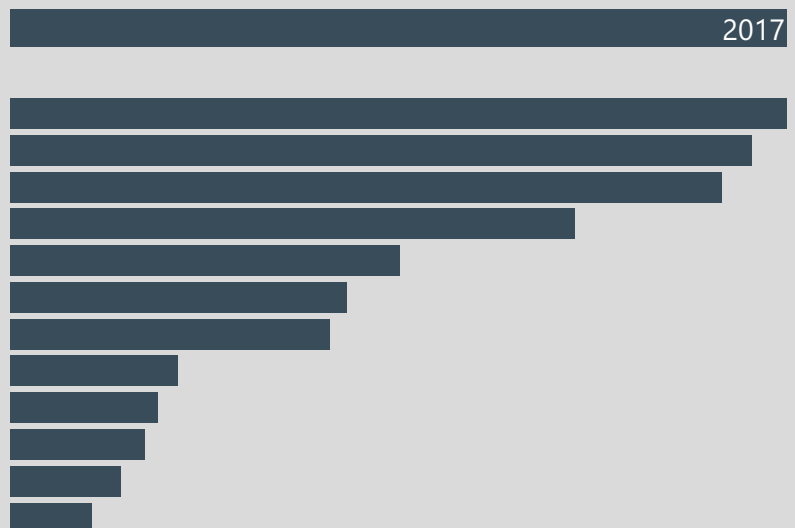
		2016 (\$m)	2017 (\$m)
1	SACE	5,374	4,827
2	Bpifrance	-	4,351
3	Finnvera	-	2,843
4	Euler Hermes	2,087	2,673
5	CESCE	-	182
5	GIEK	305	123
6	EKN	-	49



### Cruise sector market lenders

#### Top Lenders by volume

Pos	Name	2016 (\$m)	2017 (\$m)
1	BNP Paribas	1,695	2,688
2	HSBC	840	2,140
3	CDP	2,129	1,984
4	KfW IPEX	452	1,587
5	Santander Bank	448	1,512
6	Société Générale	440	1,126
7	SMBC	568	909
8	Citi	239	486
9	Commerzbank	-	470
10	BayernLB	329	422
11	Crédit Agricole	403	330
12	DZ Bank	-	271



### Order books

Cruise ship orders by yard						
Yard	2019	2020	2021	2022	2023+	Total
Fincantieri	4	4	4	5	11	28
STX France	2	2	2	2	3	11
Meyer Werft	3	2	2	2	2	11
Meyer Turku	2	1	1	2	2	8
VARD	5	-	1	-	-	6
China State Shipbuilding Corp.	-	-	-	-	2	2
<b>Total</b>	<b>16</b>	<b>9</b>	<b>10</b>	<b>12</b>	<b>20</b>	<b>67</b>

Source of the order book: [www.cruiseindustrynews.com](http://www.cruiseindustrynews.com), wikipedia, cruise line statements

Cruise vessel orders by customer							
Used ECA*	Cruise line	2019	2020	2021	2022	2023+	Total
Yes	Viking Ocean	1	-	1	2	7	11
Yes	MSC Cruises	2	1	1	1	4	9
Yes	Norwegian Cruise	1	-	-	1	3	5
Yes	Royal Caribbean	1	1	1	1	1	5
No	Costa Cruises	2	1	1	-	-	4
Yes	Virgin Cruises	-	1	1	1	-	3
No	Celebrity	-	1	1	1	-	3
No	Princess	1	1	-	1	-	3
Yes	Ponant	2	-	1	-	-	3
Yes	Disney	-	-	1	1	1	3
Yes	Carnival	1	1	-	1	-	3
Yes	Hapag-Lloyd	2	-	-	-	-	2
No	Carnival China	-	-	-	-	2	2
No	P&O Cruises	-	1	-	1	-	2
Yes	AIDA Cruises	-	-	1	-	1	2
Yes	TUI Cruises <sup>1</sup>	1	-	-	1	-	2
No	Rest	2	1	1	1	-	5
<b>Total</b>		<b>16</b>	<b>9</b>	<b>10</b>	<b>13</b>	<b>19</b>	<b>67</b>

<sup>1</sup> TUI Cruises is a joint venture between TUI and Royal Caribbean

Source of the order book: [www.cruiseindustrynews.com](http://www.cruiseindustrynews.com), wikipedia, cruise line statements

\*Previous users of ECA debt since 2012. Source: [www.tagmydeals.com](http://www.tagmydeals.com)

The top four shipyards over the last two years were Fincantieri, STX, and Meyer Werft and its 70% subsidiary Meyer Turku. They are likely to remain the top four yards over the next five years, though Fincantieri is likely to account for almost as many orders as the next three yards combined. However, there is likely to be a significant drop in volumes from the fall in orders from 2019 to 2020, but the years after 2023 look promising for ship orders.

### ECA debt likely?

Given the top four yards' importance to ECA financing volumes, this order book suggests that ECA financing is likely to remain a mainstay of cruise ship financing over the next five years. The profile of customers over the next three years also, in general, inspires confidence in the health of the ECA finance market. The four largest sources of orders have all used ECA finance over the last two years, though the top source, Viking Ocean, has used ECA debt less recently.

Whether the market broadens in the medium term will depend on the tier of customers below them. Costa and Celebrity are both large operators that have not closed ECA financings since 2012, but may use ECA financing depending on market conditions.

Cruise operators may have access to the bond market or uncovered bank debt depending on relative pricing levels. The continued health of credit markets will probably be key to their financing levels. Of the remaining operators, only four outside the top ten have used ECA debt since 2012. Whether these operators are prepared to go through the processes necessary to raise ECA debt — and ECAs can get comfortable providing them with credit — will decide whether this broadening takes place.

### Could ECAs back refurbishment?

Refurbishments of vessels could lead to capital-intensive works to operators' existing fleets, as cruise customers come to expect better facilities and vessel performance, and operators compete ever more intensely for older and wealthier customers.

Whether these refurbishments lead to substantial orders for the established shipyard, and therefore their ECA backers, is a more open question. Some works may be large enough to justify a financing package, though these are unlikely to register on volumes to the same extent as new-builds. If banks and ECAs can creatively support a multitude of smaller contracts this may open up a profitable new financing class.

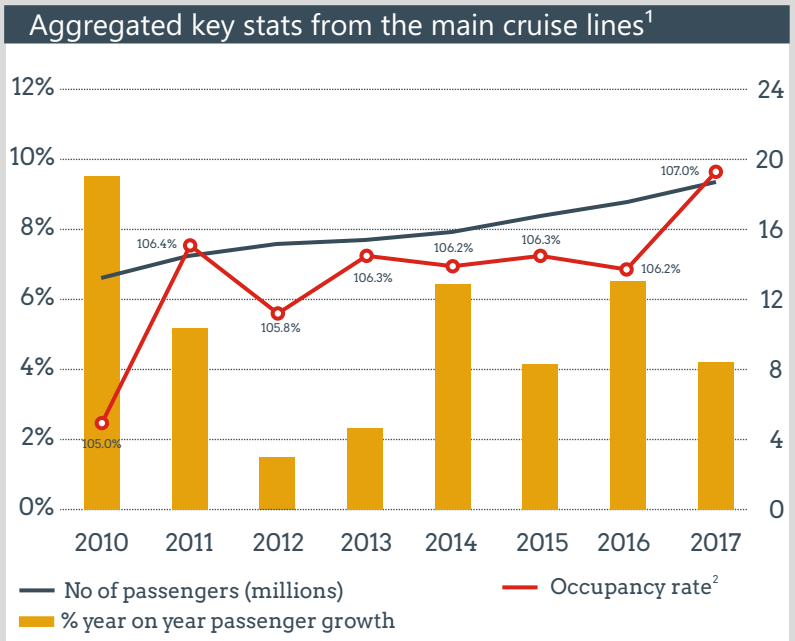
### Demand for cruises

Demand growth for cruises has been very robust over the last seven years. Operators have kept occupancy rates under fairly tight control, so much so that rates ticked up sharply in 2017, though the recent boom in orders, and therefore financings, may alter that picture over the next several years.

Slower growth in 2012 and 2013 followed a boom in 2010, but since 2014 growth has been at least 4% per year. The Cruise Lines International Association, an industry trade body, has forecast \$6.8 billion in investment in the industry in 2017, passenger capacity additions of around 30,000 in each of 2017 and 2018, and 52,000 in capacity added in 2019.

Older and wealthier passengers have driven this growth in the cruise market, as well as speciality cruises built around niche interests. The growth in disposable income in emerging markets, thanks to a growing middle class in those countries, may be the secret to longer-term growth in the cruise market. China, in particular, and to a lesser extent India and Japan, are of interest to operators.

If established operators can learn to cater to this emerging demographic, then the established pattern of orders, by top-tier operators from top-tier yards, will continue. If upstart operators show a keener understanding of this demographic's needs, then different financing methods, and a different cast of ECAs and lenders, might find a foothold.



<sup>1</sup>Carnival group, Royal Caribbean Group and Norwegian Group. We estimate that they could represent around 75-80% of the market.

<sup>2</sup>Occupancy is the result of the available passenger cruise days (days of cruise multiplied by the number of cabins, based on the assumption that all the cabins are double) divided by passenger cruise days (number of passengers multiplied by the number of nights). Occupancy rate can exceed 100% if cabins are occupied by more than two people (i.e. a family).

# FPSO market

## OPINION

### Key risks

Fluctuations in the price of oil during and since the global financial crisis have had a dramatic effect on the FPSO and offshore shipping markets more generally. From highs of USD147 a barrel in July 2008 to lows of USD40 a barrel in February 2009, oil prices then recovered to the USD90 to USD120 a barrel range in the three years prior to 2014. From July 2014, however, a more prolonged decline in the price of oil began, culminating in sub USD30 a barrel in February 2016. This was fuelled by significant increases in the amount and efficiency of shale oil production in the US and an uncertain macro-economic environment (particularly in key economies such as China).

This decline has led to the offshore oil industry embarking on a period of restructuring in conjunction with weak or non-existent new tendering activity which has left many offshore operators with laid-up vessels and financial headaches.

ECA supported FPSO financings are often concluded on the basis of security provided over long term charter contracts with credit worthy counterparties. However, care has to be taken by financiers even where long term cashflow is available. Recent events in Brazil and elsewhere have shown that charterers are willing to terminate long term arrangements where the right to do so presents itself and many 'house' forms of charter insisted on by national and international oil companies in FPSO tenders are charterer friendly. Detailed diligence should be carried out on project documents with a particular focus on: (a) charterer termination rights, (b) tax risk sharing, (c) counterparty assignment rights, (d) FX risks, (e) charter rate adjustments and (f) local content requirements.

FPSOs consist of a hull, which can either be purpose-built, or converted from a former oil tanker, and topsides which include hydrocarbon processing equipment for separation and treatment of crude oil, water and gases. Topsides are highly specialised and expensive, and present an element of redeployment risk for a financier as, depending on the location of any redeployment, they may need to be specially tailored to the field where the FPSO is to be used. This can be a very expensive process and vessel costs more generally of USD 1 billion plus are not uncommon.

### Key opportunities

A gradual recovery is being reported in the FPSO sector as oil prices have begun a sustained recovery. This is making some mothballed offshore oil reserves economically viable again and prompting renewed interest in using FPSOs. An expansion of deepwater development activity (to which FPSOs are naturally suited) will likely further drive activity. We are also starting to see some relaxation of local content regimes which may encourage projects in certain key production jurisdictions.

Despite the risks identified above regarding redeployments, a number of FPSOs have been moved multiple times and may (depending on the redeployment location and reservoir characteristics) represent the most cost effective and, because of their mobility, fastest solution to develop a marginal field. Rising oil prices may also mean further development of existing fields becomes feasible, increasing the likelihood of extension options being triggered and potentially in turn triggering refinancing.

As in other shipping sectors, we are also seeing interest from FPSO operators in constructing vessels in China both to take advantage of the yard capacity there but also as a way of accessing Chinese investment and financing.

Overall we expect comparatively strong growth, compared to recent activity levels, over the next few years with Brazil continuing to be active and offshore Africa a growth market.

**ALLEN & OVERY**

### FPSO

Floating production, storage and offloading vessels are extremely popular with lenders. They are adapted to use far offshore at a particular field, and since they cannot easily be repurposed, are usually financed off the back of long-term charters with field operators. They usually comprise an existing tanker hull fitted out with new storage and processing equipment. The conversion and the installation of the additional equipment can usually attract solid ECA support.

These vessels are often found in emerging markets, which may lack the infrastructure needed to carry oil ashore. The undisputed leader in the procurement of FPSOs was, until recently, the Brazilian national oil company Petrobras, which is dependent on FPSOs to exploit its promising pre-salt discoveries.

Until recently, Petrobras was so popular that FPSO operators with Petrobras charters could turn to bond and private placement markets to fund conversions. Commercial banks would compete strongly enough with the capital markets, and financing requirements were low enough, that ECAs became less vital. But when Petrobras' fortunes started to turn in 2015, in the wake of a corruption scandal that eventually engulfed the rest of Latin America, financing activity worldwide slowed rather than migrating to the ECA market.

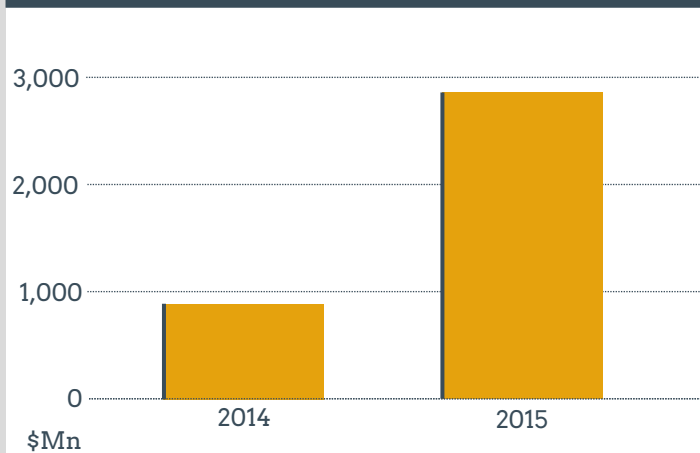
The most recent deal, SBM's \$720 million ten year financing for its Liza vessel, came from 12 banks at pricing of 165bp over Libor. The counterparties on the vessel's charter are Exxon, Hess and CNOOC, which will use the vessel at their Stabroek field offshore Guyana. In January 2017 Malaysian FPSO operator Yinson used a \$780 million Islamic murabahah facility to refinance its construction loan for use at the Offshore Cape Three Points field in Ghana.

SBM sponsored the last ECA-supported FPSO deal to close to date. That was the \$1.55 billion Cidade de Saquarema financing, in which NEXI, Atradius, SACE and UKEF all participated, and which closed in July 2015. Saquarema needed that depth of ECA support in part, because of the presence of Petrobras as an offtaker and market perception in the wake of Brazil's corruption scandals.

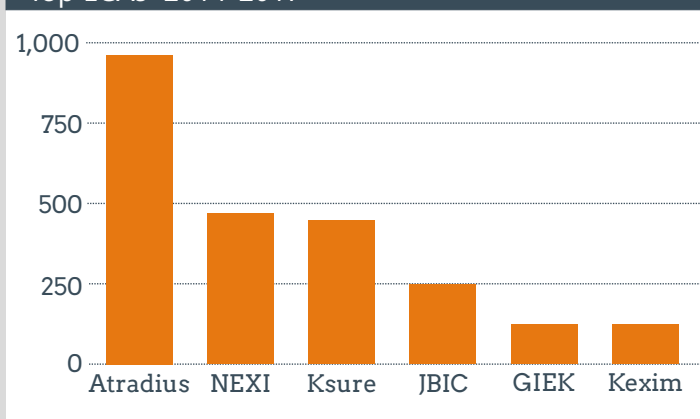
Three deals closed in 2015 – Saquarema, the \$1.2 billion financing for Modec's Tartaruga MV29, and a small Atradius-supported refurbishment project for Teekay – and one in 2014 – Teekay's \$815 million Knarr acquisition in the UK North Sea. However Atradius' ticket on Saquarema was enough to make it the most successful ECA backer of FPSO financings of the last four years, and SBM the top sponsor.

In contrast to the cruise ship sector, Asian sponsors, yards and ECAs enjoy a strong competitive position, even if operators are a mix of Asian, European and U.S. firms. FPSOs can be a lumpy, cyclical business. Between 2015 and 2017 annual fleet additions doubled, as orders signed before the oil price downturn translate into deliveries in a very different market.

Total volume for FPSOs 2014-2017



Top ECAs 2014-2017



		Vol (\$m)
1	Atradius	888
2	NEXI	400
3	K-SURE	308
4	JBIC	252
5	GIEK	120
6	KEXIM	118

Top sponsors 2014-2017

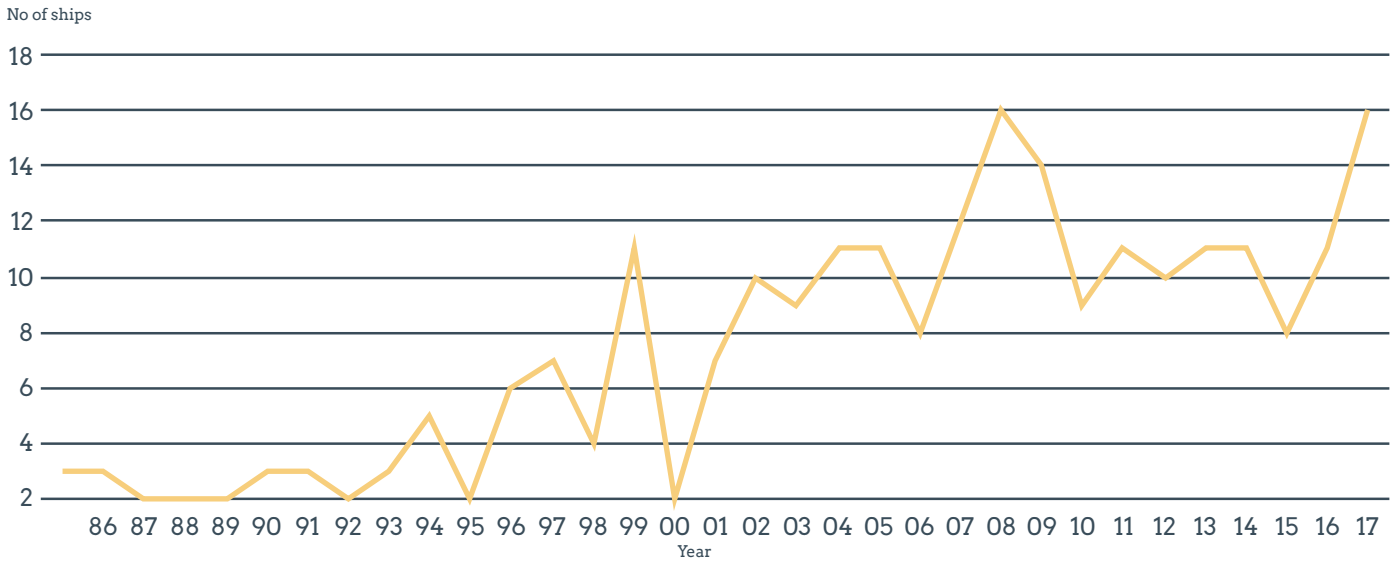
		Vol (\$m)	No of deals
1	SBM Offshore	1,550	1
2	Modec/Mitsui/Marubeni	1,262	1
3	Teekay Corp.	903	2

Top exporters 2014-2017

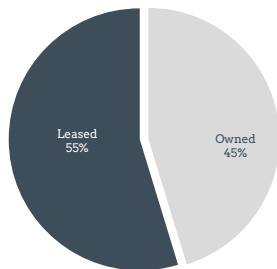
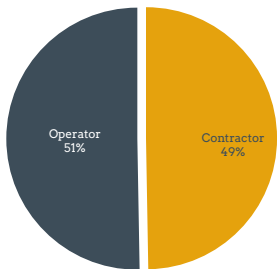
		Vol (\$m)	No of deals
1	SBM	1,550	1
2	Keppel	1,262	1
3	Samsung	815	1
4	Damen	88	1

### FPSO

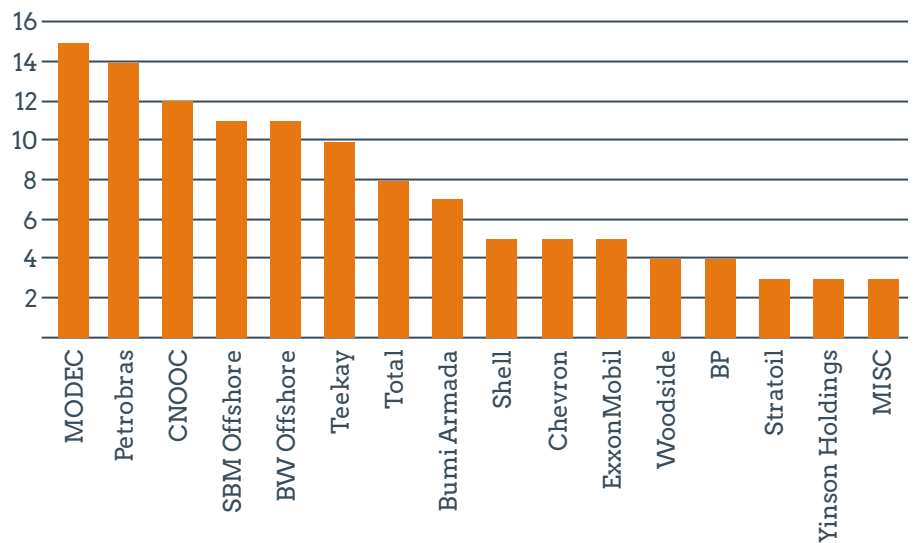
#### FPSO fleet by age



#### FPSO ownership details



#### FPSO fleet by owner



#### Pending orders

Five more FPSOs are due to be delivered over the next three years, three of them to Brazilian waters, where Petrobras is the operator. Japan's Modec accounts for all three, a bold bet on a Brazilian oil and gas sector that has already created casualties among FPSO operators.

The experience of Modec and SBM to date suggests that a small amount of supplementary ECA debt as part of a larger commercial bank group will be enough to bring vessels into operation. But where banks are still too full up on Brazilian risk, ECA support may be vital.

	Year	Name	Operator	Field country
1	2018	Cidade de Campos MV29	Petrobras	Brazil
2	2020	Liza	Exxonmobil	Guyana
3	2021	Carioca MV30	Petrobras	Brazil
4	2021	Guanabara MV31	Petrobras	Brazil
5	2021	Penguins	Shell	UK

Sources: 2017 FPSO survey Offshore Magazine & own research

# LNG market

## OPINION

LNG is now firmly established as an essential element of the domestic energy supply in Europe, Asia and the USA. In the biggest markets, Japan has had to shift away from nuclear and Korea has recently made policy decisions to move away from nuclear and coal. In China, the government is providing subsidies to encourage the conversion of industrial boilers and district heating plants from coal to gas in the main urban areas and has recently overtaken Korea as the second largest importer of LNG. Gas to power projects to fuel the power needs of a growing middle class in South East Asia are adding new countries as LNG importers.

In Europe, concerns over the security of the gas pipelines from Russian gas fields, have strengthened LNG's position as a clean and affordable source of energy. As a fuel, it releases a small fraction of the air pollutants compared to coal and releases less carbon into the atmosphere. In addition, gas fired power plants are easier to ramp up and down than coal fired power plants and hence gas fired power plants are a useful source of standby or back up power for the increased level of renewables in the power mix. This has seen gas replacing coal for power generation purposes. In addition, gas is used for industrial production which requires high heat levels.

LNG is already making inroads into fuelling the world's shipping fleets with several major shipping companies undertaking to introduce LNG-fuelled ships and hundreds of LNG fuelled vessels already on the world's oceans. Battery technology increasingly used in cars currently takes up too much space and is too heavy to be feasible as an energy source for heavy transport. LNG powered trucking is on the rise for the same reason.

### Key risks

The LNG shipping market's biggest handicap is that it is very dependent on costly infrastructure for liquefaction at the start of the voyage, regasification at the end of the voyage and storage at both ends. This is a significant factor in slowing the establishment of LNG bunkering for ships. The entry of China into the market may have a disrupting influence, as it did in container and bulk shipping, by providing cheaper alternatives to existing ships; good for consumers, but a headache for those owning and financing expensive older ships.

### Key opportunities

Demand for LNG is dependent in part on infrastructure being in place to store and distribute it to end-users. As this infrastructure improves, demand is likely to increase. Outside the domestic heat and electricity generation markets, bunkering ships may become a growth market for LNG, requiring bunkering vessels and storage facilities. Both cargo and cruise ships are under considerable pressure to stop using sulphurous oil-based bunkers and to lower their CO2 emissions; LNG offers great potential in this area and since LNG is transported by sea, establishing local supplies should not present an insurmountable challenge to the shipping industry. For instance, floating storage and regasification units (FSRUs) can be designed to provide the flexibility to bunker LNG.

In fact, FSRUs have been a game changer in the regasification market. Technical innovation has led to units which are reliable, faster to market and cheaper than onshore regasification terminals and flexible, in that they are capable of being redeployed as owners and operators such as Excelerate have shown. They are opening up new LNG markets which previously had no established regasification infrastructure, particularly in South East Asia and Latin America.

Furthermore, the political risk of pipeline gas to Europe from Russia has become apparent during the last few winters, perhaps prompting governments to look to LNG for a secure energy supply. This has seen FSRUs deployed in places such as Lithuania.



Demand for floating liquefaction storage and offloading units (FLSOs) or floating LNG (FLNG) units, the LNG equivalent of FPSOs is rapidly increasing. Whilst the low oil price environment held a number of these projects back, two newbuilds and one LNG vessel conversion are now onsite and either in commissioning or operation. The relatively smaller production capacities mean that it is easier to secure offtakers for an FLNG project to proceed to final investment decision, as the market has seen with the Coral South FLNG project. In addition, FLNG units can be deployed to access stranded or small gas fields which would otherwise be uneconomical to develop. They can also be deployed near-shore, reducing the implications of having to build a large scale LNG project onshore.

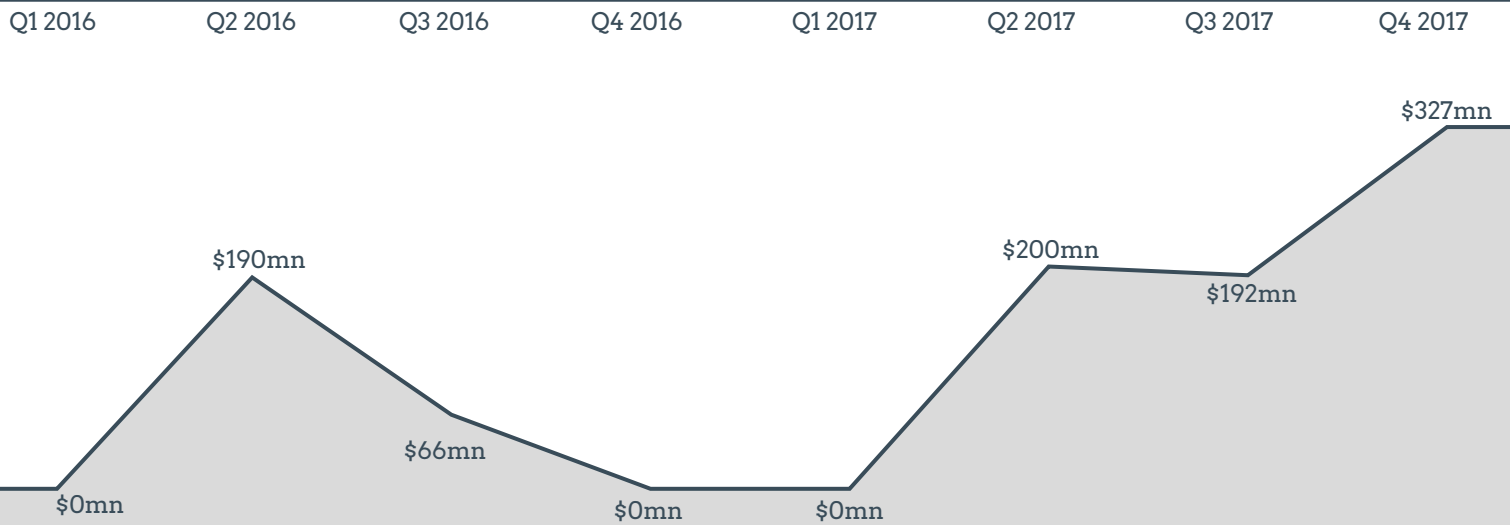
The Coral South FLNG project was recently financed by five ECAs and a large number of commercial banks. It was the largest project financing in African history and the first project financing of an FLNG unit. The units to date, have been built in the Korean shipyards (with one barge based unit yet to be deployed having been built and commissioned in a Chinese shipyard) or converted in the Keppel shipyard in Singapore. FLNG units have highly complicated topsides and can have hulls larger than aircraft carriers. In addition, there is no standardisation, with the entire unit having to be built to meet the gas field specifications. ECAs have shown a strong willingness to support their shipyards and investors involved in FLNG projects.

ECA finance is vital for LNG to succeed: the liquefaction, shipping and regasification elements of projects require massive long-term investment. As with many shipping transactions, financing the shipping element requires skilled sponsors and shipyards and creditworthy offtaker or charter contracts in place to generate steady and reliable returns. The ships are also highly technical to construct, giving the experienced Korean and Japanese shipbuilding industries an edge. Their ECAs dominate the market, although the recent entry of China into both building and financing LNG carriers and a barge based FLNG unit points to increased competition and the possibility that Chinese shipping companies will be vying with the established ones to transport gas in the not too distant future.

Whilst global demand for, and production of, LNG continues to increase, there is not a deep spot market and LNG does not easily trade as a "commodity" given the limited supply sources and demand locations, often geographically spread and there is not currently a "market" for resale of FLNG units, LNG vessels and FSRUs. As such, we expect units and vessels built to service different parts of the LNG value chain to continue to be financed on the basis of long term offtake or charter contracts. ECAs will continue to play a significant part in this market given the scale and costs of the units and vessels and the desire to support their shipyards, assist with the development of developing countries and decarbonisation of economies and secure LNG supplies.

**ALLEN & OVERY**

### LNG Ships

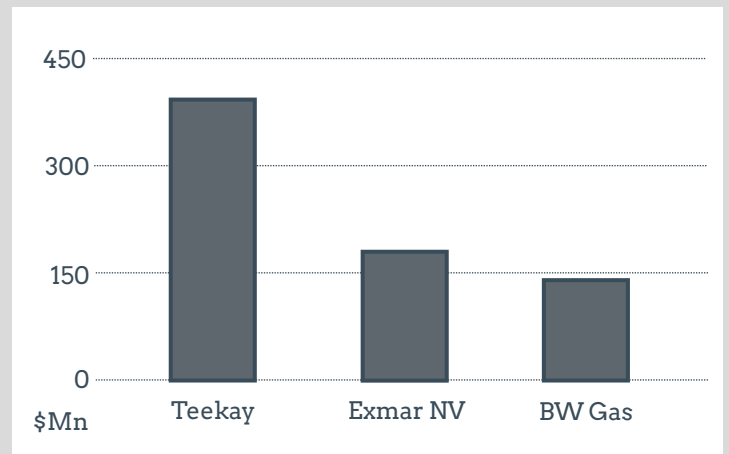


The LNG market is changing, with new producers in the U.S. putting pressure on prices, and new consumers in Europe looking to diversify their supply base. Asia remains a key LNG market, and Asian ECAs, whether as consumers of LNG or manufacturers of LNG tankers, are active in financing tanker fleets. After a subdued 2016 and first quarter of 2017, financing activity improved sharply. The three most active operators over the last two years all closed their financings in 2017, and all three were buying Asian-made vessels.

### Top borrowers & exporters

#### Top borrowers for LNG ships

	2016 (\$m)	2017 (\$m)
1 Teekay	-	327
2 EXMAR NV	-	200
3 BW Gas	-	192
4 NYK	190	-
5 Navig8 Group	66	-



#### Top exporters for LNG ships

	2017 (\$m)
1 Daewoo	327
2 Wison Nantong	200
3 Samsung	192



### LNG Shipping market review

#### Introduction: a volatile market

The recent boom in LNG liquefaction capacity, most of it concentrated in Australia and on the U.S. Gulf Coast, has led to an increase in the demand for transportation capacity. The most exciting opportunities so far have been in floating storage and regasification units, which are cheaper and more flexible alternatives to land-based LNG receiving terminals.

The largest deal to close in the last two years, and the only one to close in 2017, was the \$200 million Sinosure-backed financing for a floating liquefaction vessel sponsored by Belgian operator EXMAR. That deal, for which Bank of China and Deutsche Bank were lenders, supported a final instalment payment for the construction at the Wison Nantong yard of the Caribbean LNG vessel.

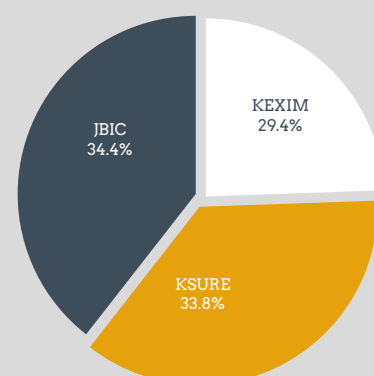
The financing closed even though the customer for the vessel, Pacific Exploration and Production, cancelled its contract in March 2016. The unit has been on the market for some time and has recently been linked with a potential Iranian export project.

The other high-profile LNG financing to close in the last two years has a more robust contractual structure. The \$190 million financing by JBIC and MUFG for NYK's Rosewood backed the construction of vessels serving the Cameron LNG liquefaction facility in the U.S., which has a suite of strong Japanese offtakers.

#### Top ECAs in the LNG vessel market

##### Active ECAs in the LNG market

		2016 (\$m)	2017 (\$m)
1	KEXIM	-	218
2	Sinosure	-	200
3	K-SURE	53	135
4	JBIC	133	0



#### LNG shipping market lenders

##### Top Lenders by volume

Pos	Name	Vol (USDm)	Share (%)
1	Bank of China	150	21%
2	Crédit Agricole	114	16%
3	KfW IPEX	96	13%
4	Deutsche Bank	50	7%
5	ABN AMRO	18	3%
6	Société Générale	18	3%



### LNG Shipping market review

#### A volatile market

Gas-fired power generation has driven the growth in the global LNG trade, as coal gets progressively less attractive to power producers because of its high cost and carbon emissions. Renewables may start to displace gas in some circumstances, but for now gas has a crucial role in balancing renewables.

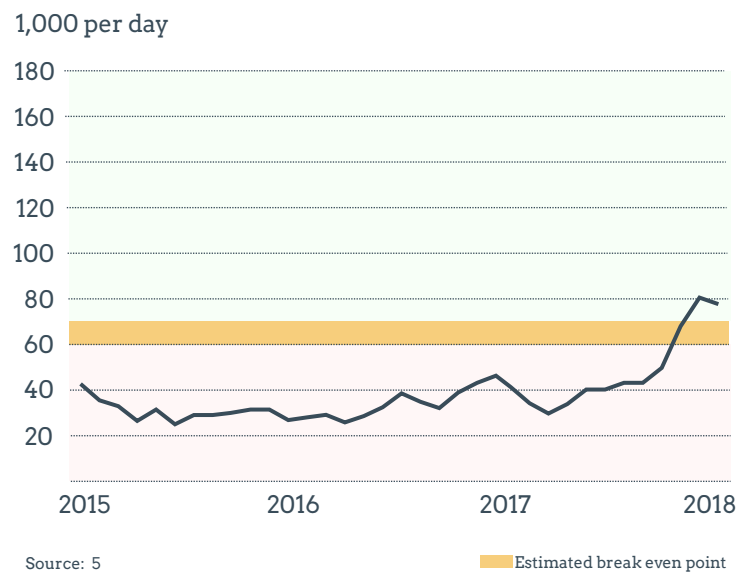
So, despite the transaction record recently, transporting gas from regions where demand is weak, or production is booming, looks like a winning industry. Short-term charter rates certainly seem to reflect a growing tightness of vessel supply, climbing above break-even by the end of 2017. The challenge for exporters and, by extension, vessel owners, is that the structure of the global LNG market is shifting.

The long-standing linkage between LNG contract pricing and crude oil prices has been progressively weakening, with customers increasingly demanding linkages to gas price benchmarks like Henry Hub instead. Some producers are even willing to sell cargoes on a spot basis rather than under contract. A growth in LNG spot trading volumes may weaken the credit profile of LNG vessel financings.

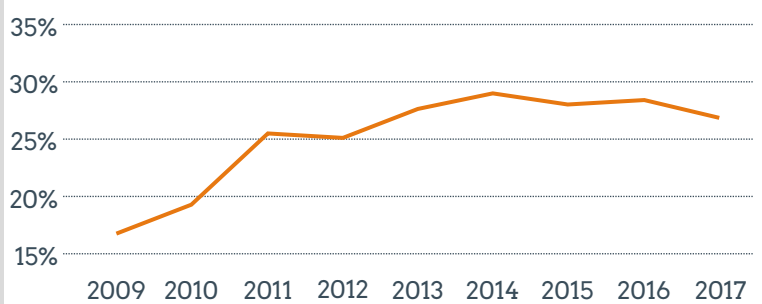
Shipping lenders who have looked to long term charter based cashflow volumes before residual value have suffered lower losses than asset-based lenders, and will be wary of supporting riskier LNG carrier deals.

That said, Asian ECAs, which have ruthlessly supported shipyards focusing on LNG, may be asked to look at financing vessels either without charters or with much shorter-term charters than has been common until now. With Korean yards accounting for the bulk of orders, the attitude of KEXIM and K-Sure towards spot risk will be worth following.

#### Short term rates for LNG carriers



#### Spot & short-term contracts by %



#### Global trade vs. spot & short-term contracts

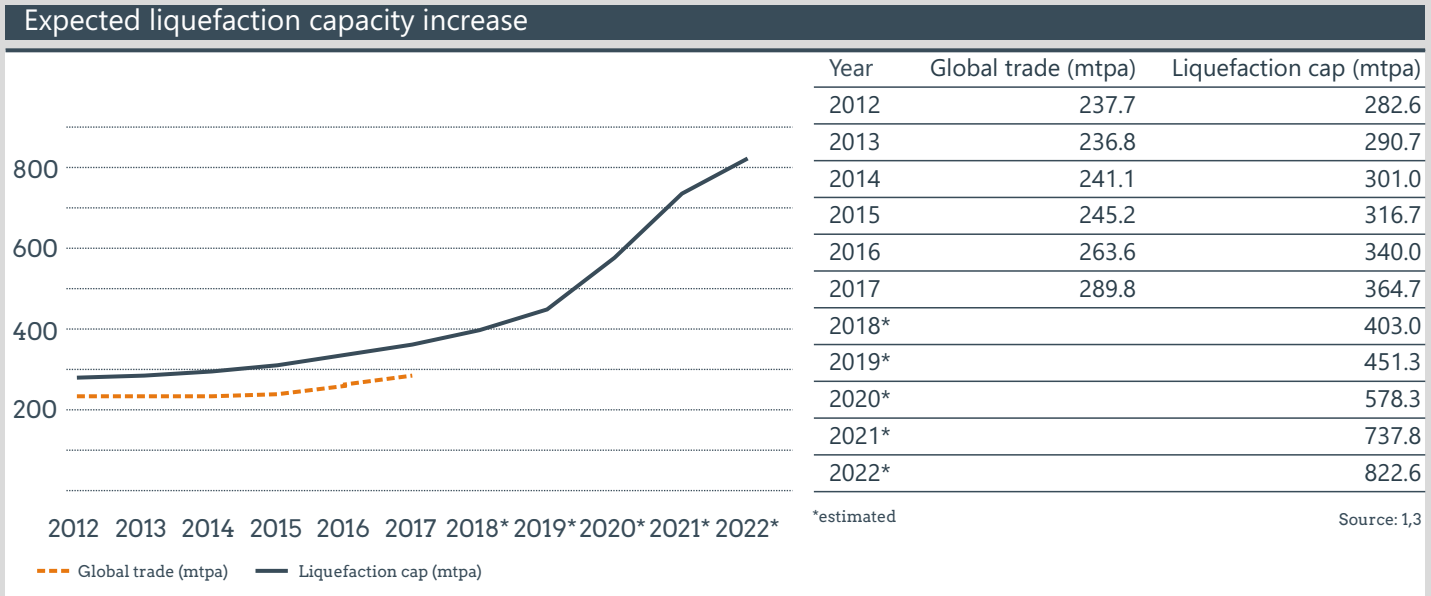
	Global trade	Spot & short term	%
2017	289.8	77.6	26.8%
2016	263.6	74.6	28.3%
2015	245.2	68.4	27.9%
2014	241.1	69.6	28.9%
2013	236.8	65.0	27.4%
2012	237.7	59.2	24.9%
2011	241.5	61.2	25.4%
2010	217.3	41.1	18.9%
2019	179.4	29.3	16.3%

Source: 3

Sources:

1. TXF research
2. International Gas Union annual reports
3. International Group of Liquefied Gas Importers annual report
4. [www.tagmydeals.com](http://www.tagmydeals.com)
5. Teekay annual report 2017

### LNG Shipping market review



#### Liquefaction capacity

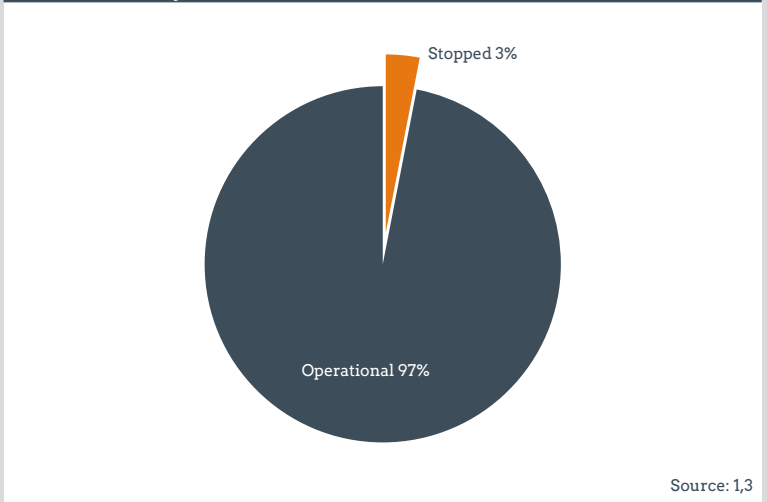
For the first 15 years of its life, liquefied natural gas was little more than a niche option for gas producers. It wasn't until 1994 that more than 10 million cubic metres of capacity came online in one year. The LNG market changed drastically this century. Annual additions have only dropped below 10 million cubic metres twice since 2000.

As costs fell and lenders and offtakers got more comfortable with producing countries like Qatar, Trinidad, Nigeria and Indonesia, LNG became mainstream. It was from 2008 — the same year as the last major financial crisis — that additions peaked, largely on the back of an increase in supply from Australia, including coal-bed methane projects on Australia's East Coast. The U.S., once predicted to be a large importer, is now poised to be a massive exporter.

LNG is now mature enough that some of the first liquefaction plants, their resources exhausted, are no longer in operation, though they account for no more than 3% of total capacity. Since existing plants tend to sell their output under long-term contracts, or simply to process gas under tolling agreements, their lenders are not usually exposed to fluctuations in prices, though the fate of U.S. receiving terminals, built to meet a domestic shortage of gas that never materialised, reminds lenders that assets can become stranded by circumstances.

The last five years of growth in LNG liquefaction capacity could be seen as modest next to the additions planned over the next five years. While capacity grew from just under 300 million tonnes per year (tpy) to around 400 million tpy this year, it is forecast to double by 2022.

#### LNG trains by status



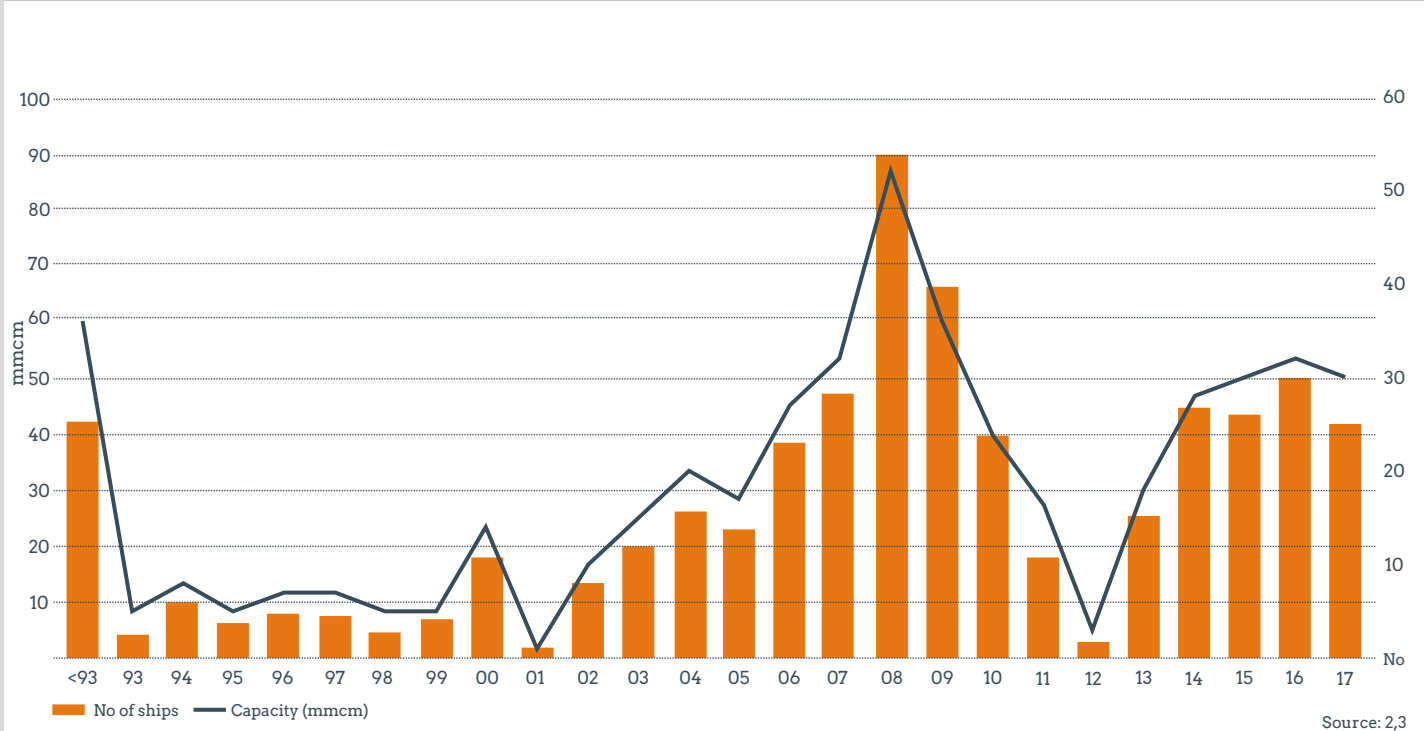
### LNG Shipping market review

#### Fleet status - young carriers

Global carrier capacity, on the other hand, is growing at a slightly more sedate pace, or about 27% over the 2018-2022 period. This might reflect the shorter lead times relative to liquefaction plants that tankers require, as well as the possibility that tankers might be diverted from serving declining gas resources towards serving newer sources of gas supply.

Still, with the global LNG carrier fleet relatively young, and two spikes in construction in 2008 and 2016, the crunch in available capacity that has pushed up short-term charter rates looks unlikely to be a persistent factor.

#### LNG fleet by age



It may, at the very least, discourage operators from refurbishing older vessels at the end of their 25-year lives, though since the peak for refurbishment opportunities is probably over a decade away, there is ample room for market conditions to swing wildly again. Newer liquefaction facilities — say in the Arctic — will require tankers with different specifications.

More promising opportunities probably exist in floating liquefaction or gasification facilities, and some of these may use LNG carriers that are no longer required by their customers. Smaller tankers may be more suited to serving newer terminals, or more niche markets. While China, Japan and Korea are still major customers, other Asian markets, not to mention Latin America, are much more likely to be customers for US producers, than suppliers to the US.

Finally, one huge opportunity for LNG lies in the increasing use of the fuel to power shipping. Bunker oil, whose carbon emissions are high, is being displaced by LNG. Increased use of LNG in shipping will require new infrastructure in a dizzying number of ports. New carriers may be required to serve it.

#### Expected fleet increase

Year	Increase of capacity*	Total expected capacity*	%
2018	9.40	79.90	+13.3%
2019	6.57	86.47	+8.2%
2020	2.79	89.26	+3.2%
2021	0.35	89.62	+0.4%
2022	0.53	90.15	+0.6%

\*in million M3, considering no fleet retirements

Source: 1,2

### LNG Shipping market review

#### Orders for LNG carriers by yard

Yard	2018	2019	2020	2021	2022	Total
Daewoo	15	19	6	-	-	40
Samsung	10	8	1	1	-	20
Hyundai	8	6	5	-	-	19
Hundong-Zhonghua	4	2	4	1	-	11
Mitsubishi	8	2	-	-	-	10
Kawasaki	6	1	-	-	-	7
Imabari	2	1	-	1	3	6
Japan Marine	2	2	-	-	-	4
Dalian	1	-	-	2	-	2
<b>Total</b>	<b>56</b>	<b>40</b>	<b>16</b>	<b>3</b>	<b>3</b>	<b>118</b>

Source: 1,2

#### Top orderbooks for LNG vessels by customer<sup>1</sup>

Used ECA*	Owner	2018	2019	2020	2021	2022	Total
No	MOL	4	2	3	-	-	9
Yes	Maran Gas	1	5	2	-	-	8
Yes	GasLog	3	4	-	-	-	7
No	Flex LNG	4	2	-	-	-	6
No	BP	3	3	-	-	-	6
Yes	Teekay	3	3	-	-	-	6
No	Dynagas	-	3	1	1	-	5
Yes	BW	2	2	-	-	-	4
Yes	NYK	2	2	-	-	-	4
No	SK Shipping	-	-	3	-	-	3
No	TMS Cardiff	-	-	-	-	3	3
Yes	Hoegh	2	1	-	-	-	3

\*Previous users of ECA debt since 2012. Source: [www.tagmydeals.com](http://www.tagmydeals.com)  
<sup>1</sup> Sole venture orders only

Source: 1,2

#### Order books: enter the ECAs

Yards in Korea, and to a lesser extent, Japan, will continue to supply the bulk of new LNG carriers. However, there is much less visibility about their long-term order books than there is in cruise ships. Only Japan's Imabari can point to orders after 2021, and Japan's other yards, with the exception of Mitsubishi, cannot point to any orders after 2019.

Korea remains the powerhouse in LNG carrier construction. Daewoo accounts for just under a third of all announced orders between now and 2022, and Samsung and Hyundai account for another third. LNG is well placed to compensate for falling orders for conventional tankers, dry bulk carriers and container ships. The container sector, in particular, has been a source of problems for Korea's official agencies, thanks to widespread distress among Korean shipping lines.

Korea's ECAs have been happy to fund the construction of LNG vessels. Both KEXIM and K-SURE, for instance, supported Golar's \$1.125 billion financing for a clutch of floating regas units in 2013. The financing, for which Citi was bookrunner, was notable for not having charters for the vessels in place.

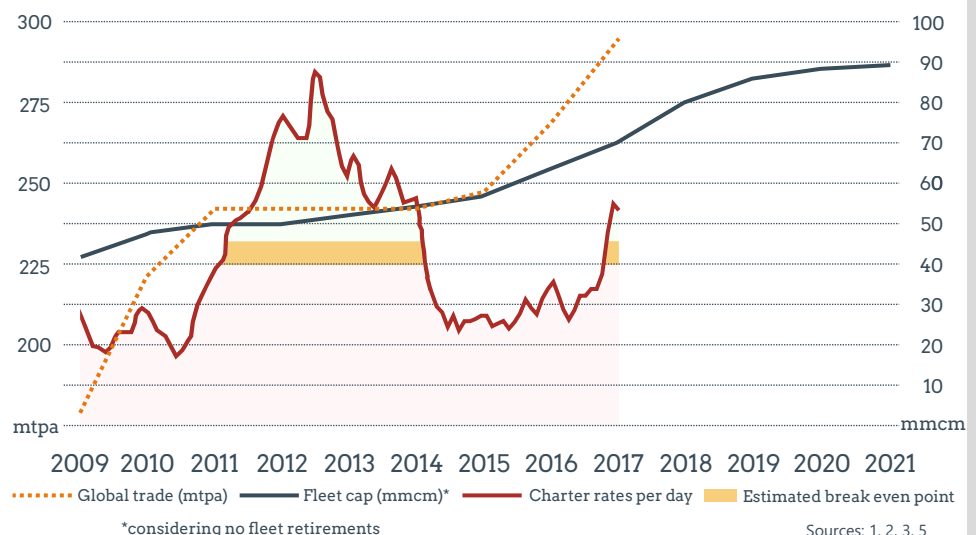
ECA financings for LNG vessels have been so rare that only half of the operators with more than three vessels on order between now and 2022 have used ECA debt in the past. But the demand for LNG carriers is much more diverse and less concentrated than the supply and might point to greater variety in financing type. With these operators having a diverse risk profile, and serving an increasingly diverse mix of customers, newer sources of financing are likely to emerge.

Since LNG carrier ECA financings are infrequent, the market is unlikely to settle on a single enduring template, though Korean ECA involvement is likely as long as these agencies have the resources to support Korean yards, and Korean yards continue to win new orders.

#### Charter rates likely to rebound after additions

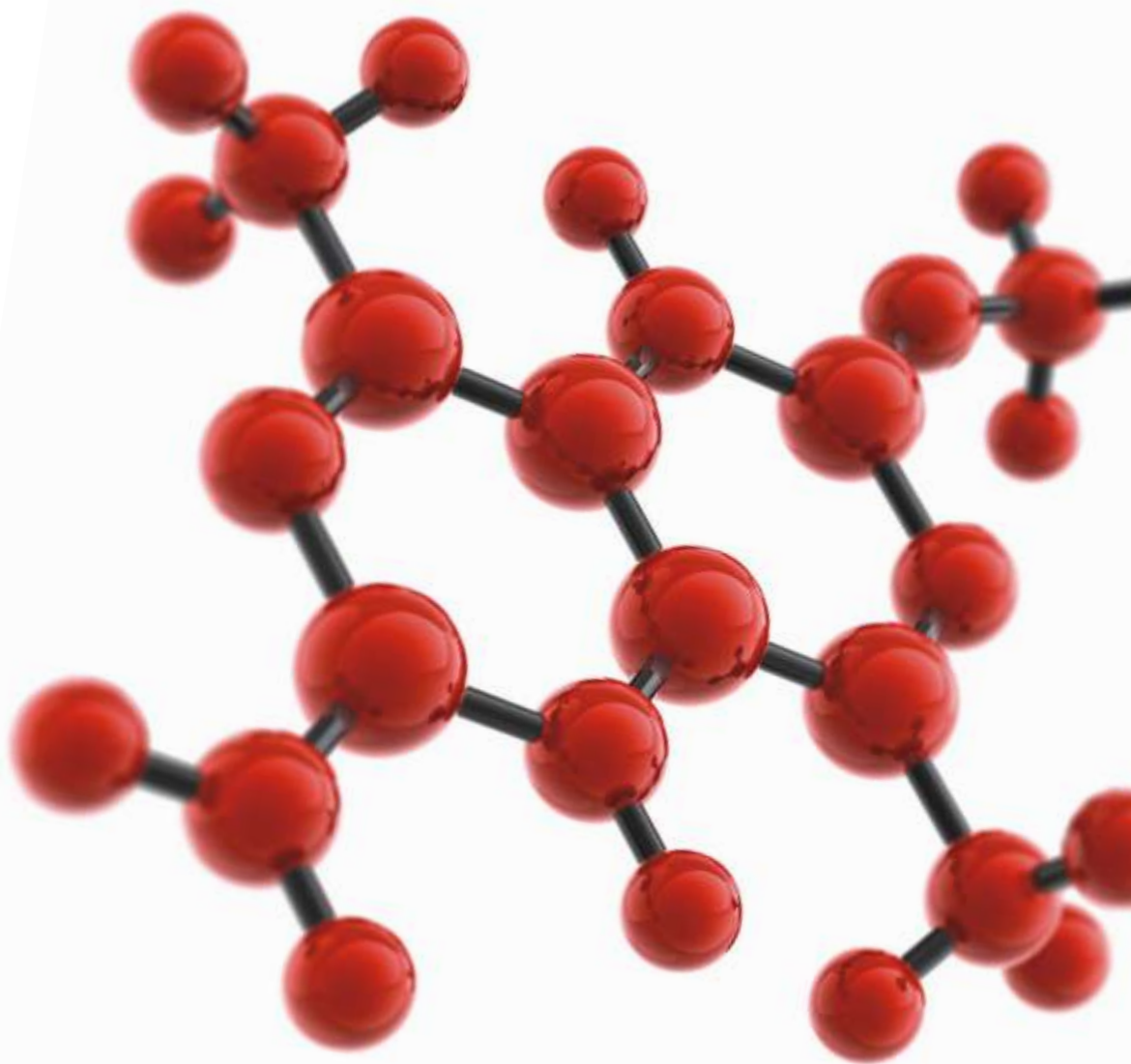
The health of the order book in turn will depend on whether global LNG demand lives up to analysts' predictions and seriously outpaces additions. In the 2011-14 period a small gap between trade levels and available capacity led to spikes in charter rates. After that, rates dropped back rapidly, before climbing sharply in 2017 as the increase in trading volumes again started to outstrip capacity.

The LNG market has proved in the past to be very sensitive to these mismatches. Customers have increasing variety and optionality in how they source cargoes, and technologies like floating regas are only adding to their options.





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