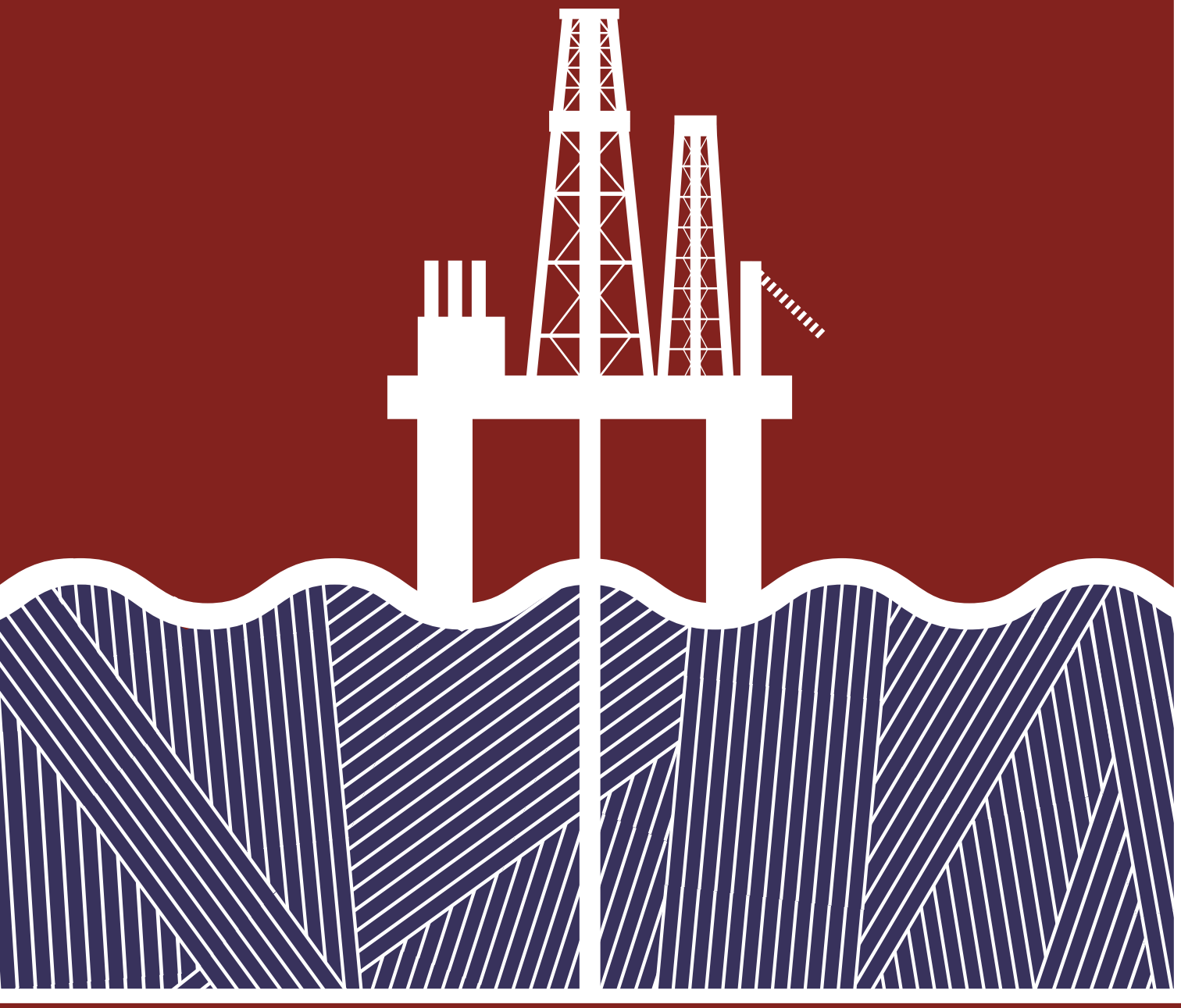
RECYCLING OUTLOOK

Decommissioning of North Sea Floating Oil & Gas Units



NGO SHIPBREAKING PLATFORM

WHO IS BEHIND?

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The data gathered by the NGO Shipbreaking Platform is sourced from different outlets and stakeholders, and is cross-checked whenever possible. Parts of the report are based on semi-structured interviews with companies and experts.

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FOREWORD

Promoting responsible practices is an essential part of KLP's responsibility as an investor. For that reason KLP in 2016 commissioned International Law and Policy Institute (ILPI) to write a report on the topic of shipbreaking practices in Bangladesh, India and Pakistan. There was a need for a more detailed analysis of the facts concerning ship recycling activity, companies' and investors' responsibilities and the regulatory landscape. Our hope was that the report would help raise awareness of the severe human and environmental consequences of ship recycling in these countries, and subsequently the risks beaching can entail for shipping industry companies, their customers, and for investors.

Since the release of the report there has indeed been an increased focus on the topic of shipbreaking by regulators, the financial industry, media and the industry itself.

In 2017 the Council on Ethics recommended exclusion of four shipping companies from investments by the Government Pension Fund Global (GPFG). The Council's assessment rests on the fact that the companies for several years sent ships to be broken up for scrap on the beaches of Bangladesh and Pakistan. Norges Bank Investment Management (NBIM) excluded the companies in 2018 citing an unacceptable risk of serious human rights violations and severe environmental damage.

As of 2019 the EU Ship Recycling Regulation requires vessels sailing under an EU Member State flag to use an approved ship recycling facility (the European List of ship recycling facilities). Yards in India, Bangladesh and Pakistan have so far not been included in the list, as the yards have not been able to comply with the safety and environmental requirements set by the EU.

In 2019 the Norwegian National Authority for Investigation and Prosecution of Economic and Environmental Crime (Økokrim) is investigating its first case against a Norwegian ship-owner accused of selling a ship for beaching in Pakistan. In a verdict in the Netherlands, the company Seatrade was heavily fined and two of its executives were banned from exercising the profession as director, advisor or employee of a shipping company for one year, after the company had sold ships for scrapping in Bangladesh, India and Turkey.

With this report, we hope to inform and create awareness on a new topic regarding ship recycling and regulations, namely the regulations concerning floating structures that are used by the oil and gas industry. The fossil fuel industry in the North Sea is well known for operating with high technical standards and a strong focus on health, safety and environment (HSE). And while the decommissioning of fixed installations are under strict regulations, the case for floating structures is worrisome. Floating structures classify as vessels, and the rules that apply for the decommissioning and recycling, or lack thereof, are the same as for ships. Unfortunately, as the report will show, there is a risk that we will see more of these structures on the beaches in Bangladesh, Pakistan or India in the future.

As a large investor in Norwegian companies, and companies based outside of Norway, which operate in the North Sea, it is our moral and financial obligation to ensure sustainable and responsible business conduct. This will benefit the companies and our investments in the long run. We encourage all companies in the value chain: owners, contractors, users, traders, investors and lenders to act.

Ensure responsible recycling!

Håvard Gulbrandsen
CEO, KLP Kapitalforvaltning AS

SUMMARY

The North Sea oil and gas industry has a global reputation for technical excellence and innovation. It now faces major restructuring and new challenges in dealing with the legacy issue of decommissioning the extensive extraction infrastructure that was put in place since the 1960s.

The fixed platforms in the North Sea, many of which were built in the 1960s-70s-80s, will need to be decommissioned following the rules under the OSPAR Convention. The rules under OSPAR require that a fixed platform is removed entirely by its operator (the oil and gas company), unless the risks of complete removal are greater than the possible risks of partial removal. Given both the legislation in place and the nature of the fixed structures, which requires them to be disassembled or disconnected where they are, and brought to shore in sections or in one piece, there is a great degree of control and oversight on the decommissioning of fixed platforms in the North Sea.

On the other hand, there are also numerous floating platforms and oil and gas structures in the North Sea. Floating structures have an IMO number, like any other vessel, and have in most cases their own engines to move around. Hence, in legal terms they are different from fixed assets and installations. The rules that apply for the decommissioning and recycling of floating structures are effectively the same as those for vessels, except for the processing equipment on several of these units (i.e. FPSOs, FSOs), which needs to be properly cleaned and recycled at an approved facility according to OSPAR.

With the oil and gas sector seeing a downturn since 2014, an increasing number of offshore units have been sold for scrap.

Around 200 floating structures have been identified as scrapped globally since 2015 – and an estimated 40% of these assets ended up on South Asian beaches, where they were broken up under conditions that cause irreparable damage to the coastal environment and put workers' lives and health at risk. This is a stark increase of beached offshore structures if compared to trends of previous years.

The global oversupply in the rig-marked is pushing the oldest rigs to be recycled. There are currently 59 floating mobile drilling rigs in the North Sea, 18 of which were built before 2001. Whilst some of the older units might be converted/ upgraded, it is estimated that most of them will be scrapped in the coming years. So far, the only structure which operated in the North Sea and has been traced to a South Asian beaching yard is the FPSO North Sea Producer. There is a real risk, however, that we will see more of these cases coming up in the near future with more decommissioning projects in the North Sea.

1 The Oil & Gas sector

TYPES OF STRUCTURES: FIXED VS FLOATING

FIXED STRUCTURES

Fixed platform (1)

Fixed platforms are offshore rigs. Their steel or concrete legs are attached directly to the seabed, supporting the deck that is placed over the water surface. These structures are designed to permanently serve an oil or gas field and are not mobile.

FLOATING STRUCTURES

Floating structures are used by the oil and gas industry for the purpose of exploration, production, drilling and supporting the operation of the fixed offshore rigs.

Mobile Offshore Drilling Unit

MODU is the term used for the category of oil and gas drilling assets that are floating and mobile. MODUs can hence serve different production fields. Like ships, MODUs have individual IMO numbers, and contrary to fixed platforms, they thus fall under the ship-category, and are subjected to ship-related legislation. Several types of MODUs exist.

Jack-up rig (2)
Jack-ups have become the most common offshore drilling units. They are designed to float until they reach their destination, where upon arrival three to four self-elevating legs are extended to the seabed. The upper structure is lifted to sufficient height to handle the surrounding environment. Jack-ups are used for exploration, development and well service operations. They fall under the category of hybrids since they are attached to the seabed during operation, but can autonomously move when their legs are detached.

Drill ship (3)
Drill ships are vessels that are used for oil and gas exploration and drilling. Conventional ships and drill ships have the same structure. However, drill ships are equipped with an inbuilt mechanism for drilling operations that extends through a hole in the hull, called a "moon pool". They have also a positioning system that enables them to keep steady over the wells. Drill ships are designed for ultra-deep water operations when anchoring is difficult.

Semi-submersible platform (4)
Semi-submersible platforms are offshore mobile vessels that are permanently floating, also during drilling operations. Their weight is not supported by the seabed as is the case for fixed platforms and jack-ups. When the destination is reached, a semi-submersible is anchored by a combination of ropes, wires and chains to the seabed to keep it steady over the well. New models of semi-submersibles are equipped with thrusters attached under the structure to optimize stability. Semi-submersibles are multifunctional; they are used not only for deep and ultra-deep water operations as drilling and production units, but also as safety vessels and as heavy lift cranes.

Drilling barge
Drilling barges are mostly utilized for shallow water drilling in calm water conditions. Drilling equipment is placed on to the barges' decks and towed to the site by tugs. Anchors hold the barges in position

Other floating units

Beside MODUs, the following floating assets, also operate in the oil and gas industry.

Floating Production Storage and Offloading & Floating Storage Unit

FPSOs/FSOs are used by the offshore petroleum industry to produce, process and store oil. FPSOs/FSOs do not fall under the MODU category, but are a crucial part of the oil and gas industry. They are subject to the same criteria for recycling as conventional ships and MODUs, except from the production equipment.

Accommodation platform

An accommodation platform is an offshore structure which supports living quarters for offshore personnel. Platforms that are outdated for drilling purposes can be used as such.

Offshore vessels

It is a broad category that includes platform supply vessels (PSVs), crane vessels (C/V), well stimulation vessels (WSVs), anchor handling tug supply vessels (AHTSVs), emergency response and rescue vessel (ERRV) and offshore construction vessels (OCVs).

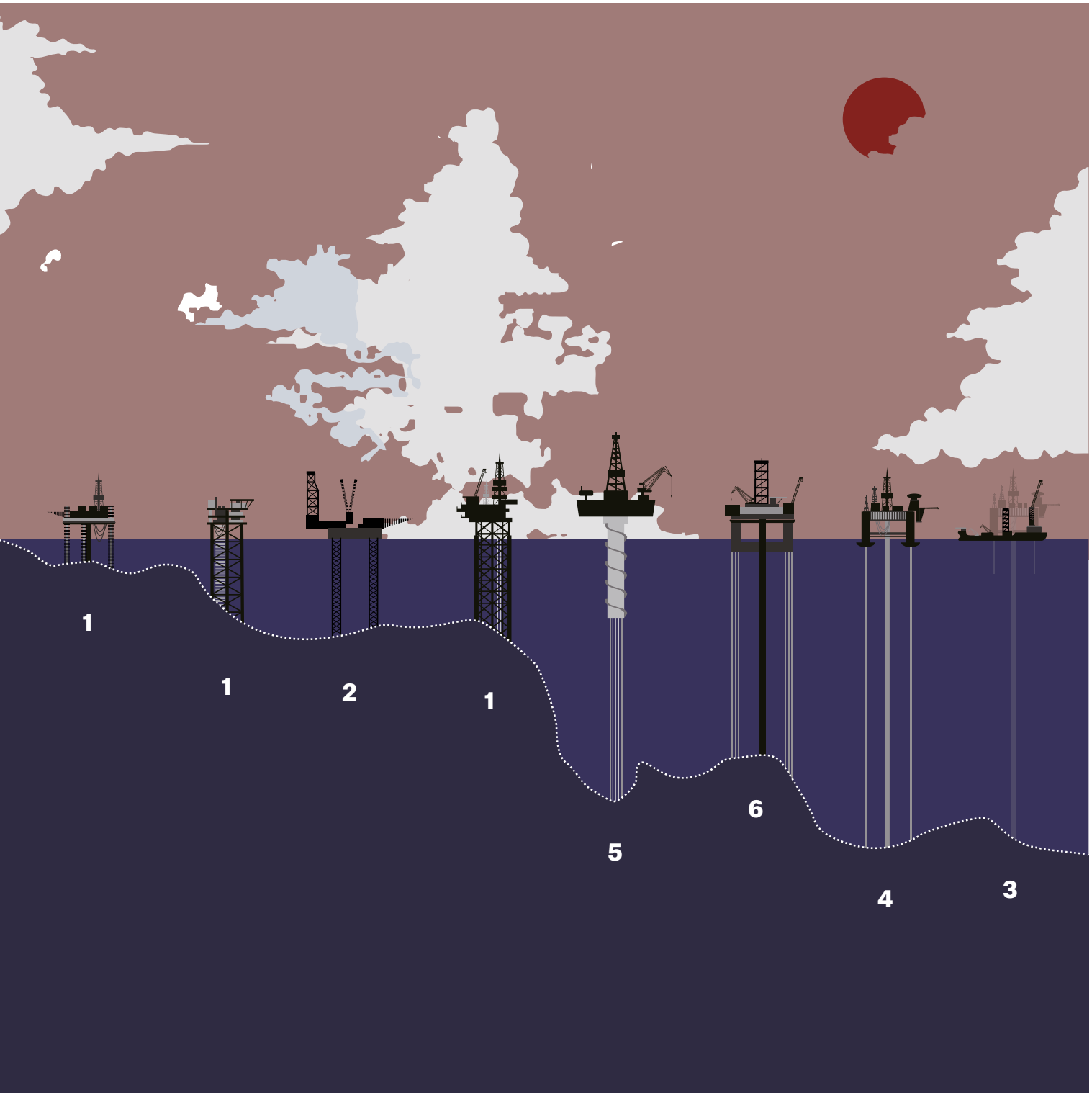
Spar platform (5)

A spar is a partially submerged offshore drilling and production platform typically used in very deep waters, and is named for logs used as buoys that are moored in place vertically. Unlike other floating assets, a spar platform does not have an IMO number and does not fall under the ship-category.

Tension-Leg Platform (6)

Like a semi-submersible, a TLP consists of columns and pontoons. The unique feature is the mooring system, which consists of vertical tendons anchored to the sea bed. Unlike other floating assets, a TLP does not have an IMO number and does not fall under the ship-category.

Graphic representation of the different types of oil and gas units



COLD AND WARM RIG STACKING

Floating units are usually subject to several leasing contracts during their lifespan. When assets are proven to be uneconomical to operate and/or are waiting for their next job in between contracts, they are "stacked". Owners can either cold stack an asset, saving on operational costs, or they can warm stack it, choosing to spend cash to ensure a more rapid redeployment. Age is the main driver for stacking.

COLD STACKING

The term cold stacking refers to assets that are temporarily taken off the market and "turned off". Cold stacked assets do not have a crew employed, are not maintained and not inspected regularly, as is the case for warm stacked assets. Based on market outlook evaluations, owners cold stack their assets if the market demand is poor, hence they save expenses of keeping the assets warm.

According to industry sources, cold stacking costs around USD 15.000 per day. However, the longer an asset is cold stacked, the costlier it becomes to re-mobilise it. To turn a cold asset warm can cost up to USD 100 million. Due to deteriorating conditions as a result of minimal maintenance, cold stacked assets' market value falls rapidly.

WARM STACKING

The term warm stacking refers to assets that are out of operation, but still have the rig crew employed, and are maintained and inspected frequently. Owners hot stack assets in the hope and belief that they will get a new drilling contract in the near future. When an asset is warm, it can quickly mobilize and start operating again as soon as it gets contracted. According to industry sources, warm stacking an asset can cost up to USD 50.000 per day. An asset that is warm stacked or in operation is continuously maintained and will thus remain in a better condition than if it is cold stacked.

UNITS IN THE NORTH SEA

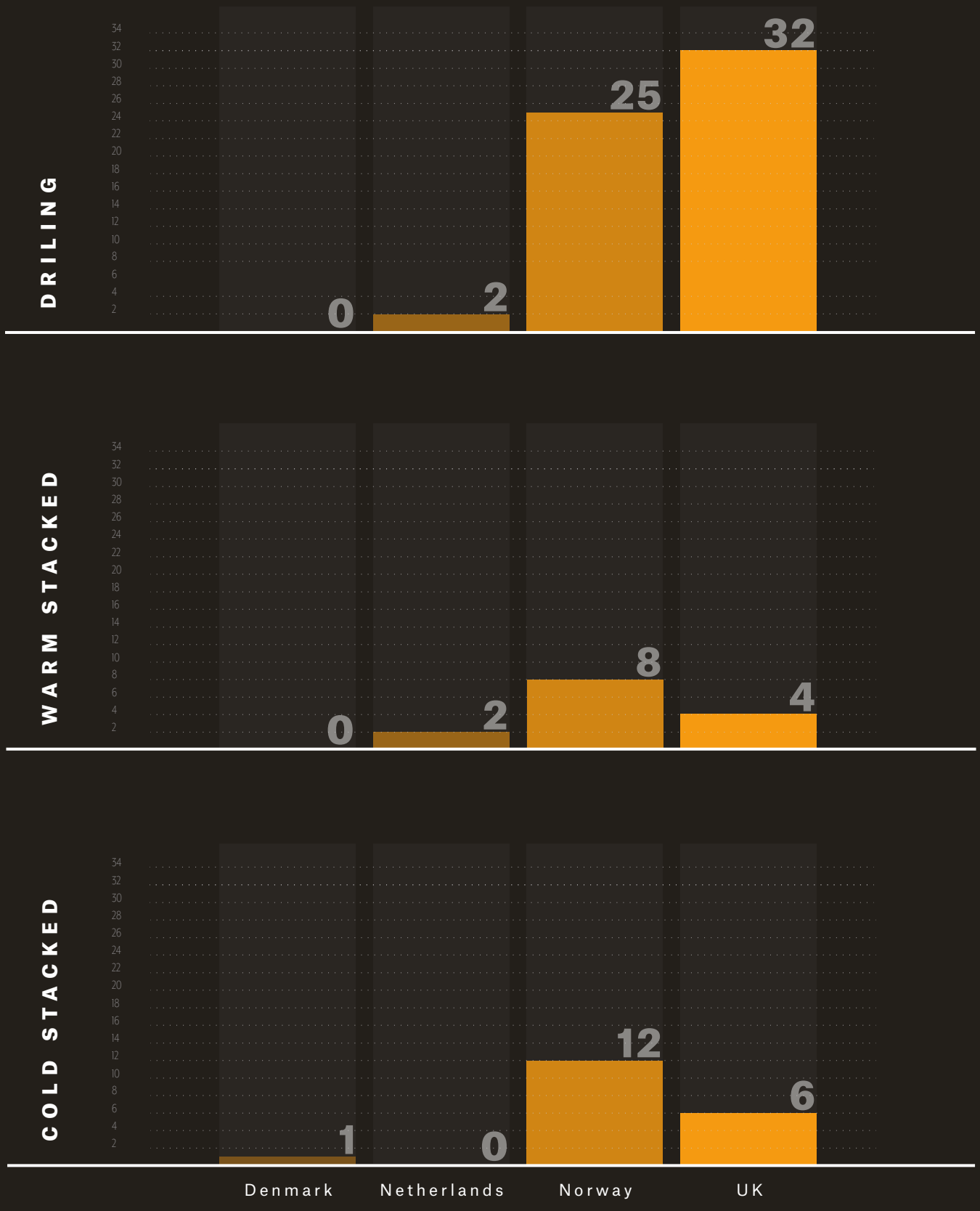
There are currently 59 floating rigs actively drilling in the North Sea, 18 of which were built before 2001[1]. Whilst the number of rigs drilling fluctuates, most of the assets built before 2001 – also called vintage, or veterans – are deployed in UK waters. In Norway, increased environmental and efficiency standards have ensured the entry of newer units. It is expected that the UK will follow a similar trend once the vintage rigs are out of contract. Assets that are considered not to be competitive in one region might still, however, be moved to another region or country where lower standards apply.

In July 2019, there were 14 warm stacked assets in the North Sea, 2 of which were built before 2001[2]. Some of these units are likely to be contracted short term or undergo reconstruction, the overall assessment is, nonetheless, that the platforms built prior 2001 are prime candidates for decommissioning in the next couple of years. This is even more true for the 19 units that are cold staked in the North Sea, 15 of which were built before 2001[3]. Whilst oil and gas prices might fluctuate in the short-term making it profitable to redeploy some stacked assets, chances are small that the cold stacked assets will get a job in the North Sea given the high costs of "rewarming" in addition to the introduction of higher environmental and efficiency standards.

1. *Bassoe Offshore, July 2019*
2. *Ibid*
3. *Ibid*

Stacked rigs at Cromarty Firth, Scotland

Overview Units in the **North Sea**



2 The scrapping of Oil & Gas structures

The decision to decommission an asset is typically driven by a number of factors, including commodity prices, basin maturity and operational costs. Floating units will fall under the scope of waste legislation and the same rules as those that cover the scrapping of conventional ships. In recent years there has been a trend of more units sold for scrap via scrap dealers known as cash buyers, which has led to an increasing number of MODUs and other offshore units being broken under dirty and dangerous conditions on South Asian beaches. The many risks related to beaching stand in stark contrast to the expertise and competence of North Sea recycling yards that are currently disposing of the fixed oil and gas structures. The particular risks posed by both the transportation and breaking up of floating oil and gas structures make a compelling case for enhancing the recycling of offshore units in Europe.

THE DRIVERS OF DECOMMISSIONING

The decommissioning of fixed platforms depends on the particular field maturity. The decommissioning of floating units, on the other hand, is not necessarily determined by the closure of a particular field. These units usually serve different fields during their operational lives, and the owner's decision to decommission an asset is inevitably influenced by several external factors, such as commodity prices, market utilisation as well as maintenance and operational costs.

Decommissioning costs for floating oil and gas structures are lower compared to fixed platforms as floating units do not have to be dismantled on-site, but can be transported directly to a yard to be scrapped. For floating platforms, owners get a scrap revenue from the sale, though it is considerably lower than for a regular ship, as MODUs hold less steel relative to size and because of transportation expenses related to bringing the unit to a recycling facility.

DECOMMISSIONING

It does not necessarily mean scrapping. After operation, some drilling units might be used for other purposes within the industry, such as accommodation facilities for offshore staff.

Following the 2014 drop in oil prices, many assets have been stacked in the North Sea. Precise decommissioning forecasts for these units are often difficult to predict, as rigs can be stacked for years in hope of finding new assignments before being scrapped or re-converted. Market fluctuations, such as a rapid rise in oil price, could for example make the asset competitive again. However, even though the market conditions have now somewhat improved, most of the stacked assets remain dormant.

The utilisation rate of offshore units decreases gradually when the number of new-builds entering the market is higher than the number of assets that are taken out of the market and stacked. The current overall utilisation rates of MODUs in the North Sea is about 60%. With more than 30 of the drilling assets in the North Sea stacked, oversupply pushes down the daily rates of drilling rigs. Today's stronger commodity prices and oversupply, which leads to low leasing rates, make exploration and production of oil and gas more lucrative for oil companies, but less lucrative for floating unit owners.

Assets built before 2001 are considered prime candidates for demolition. The year 2001 is set as a mark between old and new generation MODUs because of technical advancements. MODU generation 1 to 5 were built before 2001, and most entered the market in the 70s and 80s. The next generations, 6 and 7, were mostly built in the mid-2000s onwards. The two latter generations have a number of features that make them superior to the earlier generations, such as accessing deeper waters. Globally, there are plenty of new-builds entering the market that are technologically more advanced in terms of digitalisation, energy efficiency and safety, rendering old units obsolete. In the North Sea, oil and gas production will increasingly

be sourced from deep-water. Since exploration is moving towards deeper waters and more extreme environments, more specialised and advanced equipment is required. Given that there already is supply in the market, the current outlook for drilling in the UK and Norway is not supportive of the reactivation of cold stacked rigs.

The overall production in the North Sea is furthmore mature, with especially the UK sector in long-term decline. Whilst oil fields in Norway are less mature, and despite enhanced recovery techniques, numerous fields are reaching the end of their commercial lives. The current market for MODUs is primarily smaller projects/basins that are explored on short-term contracts by smaller O&G companies. Old cold-stacked assets are thus not competitive as earnings made on short-term contracts rarely exceed reactivation costs. If management costs consistently exceed revenues, assets will likely be sold for scrap. Stacked assets that have an upcoming Special Periodic Surveys (SPS) scheduled are furthermore likely prime candidates for demolition. SPS are mandatory to assess safety related issues, and they are costly. Hence, companies that own assets that need to undergo a SPS have to evaluate if it is worth investing in the survey or if it is more profitable to opt for scrapping.

MARKET FEATURES THAT PROMPT DECOMMISSIONING

Low commodity prices
Low day rates on assets
New-builds entering the market
Basin maturity
Short-term contracts

TRAITS OF AN ASSET PRONE TO DEMOLITION

Built before 2001
Long-term stacked
Upcoming SPS scheduled
Low utilisation rate on specific asset type
Non-digital asset
Non-harsh environment asset
Not undergone recent upgrading
Shallow water depth

LEGAL FRAMEWORK

At end-of-life, fixed platforms are partially dismantled on the spot; cut parts are then transported to a nearby scrapping site where the rest of the scrapping process continues. The decommissioning process of fixed platforms is comprehensively regulated under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR). All North Sea oil and gas producing countries[4] are signatory parties to the OSPAR Convention and thus obliged to follow its rigorous safety and environmental standards. The Convention holds the operating companies, i.e. the oil companies, and national authorities responsible for executing the safe and environmentally sound decommissioning when operations cease, and includes schemes for national subsidies. Under OSPAR there is thus a great degree of control and oversight on the decommissioning of fixed platforms in the North Sea.

On the other hand, the numerous floating platforms and oil and gas structures that operate in the North Sea do not fall under the scope of OSPAR. Floating structures have an IMO number, like any other vessel. From a legal point of view, they are different from fixed platforms and installations. Effectively, the rules that apply for the decommissioning and recycling of floating structures are the same as those for vessels.

THE BASEL CONVENTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal regulates the international trade of hazardous wastes and covers both fixed and floating oil and gas units as they usually contain hazardous materials within their structure, such as oil residues, heavy metals in paints and asbestos. The Basel Convention Guidelines[5] provide recommendations on procedures, processes and practices that must be implemented to ensure safe and environmentally sound dismantling practices.

Although the Basel Convention has been effective on ensuring the sound management of many waste streams, there has been difficulty in applying its provisions to ships and floating oil and gas structures - wastes that can in effect move on their own. Parties have recognised that Basel controls are in most cases circumvented for vessels going for breaking. As vessels, including

4. I.e. Denmark, Netherlands, Norway, United Kingdom.
5. Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of End-of-life-ships.

floating oil and gas units, only become waste when the intent to dispose them is declared, it is sufficient for owners to hide their true intentions from local authorities. Indeed, false declarations of repair or further operational use are commonly issued to circumvent the legal requirements under the Basel Convention.

EUROPEAN WASTE SHIPMENT REGULATION

The European Waste Shipment Regulation (EC) No 1013/2006 transposes the Basel Convention and the Ban Amendment into Union law. The latter bans all exports of hazardous waste from annex VII to non-annex VII countries which currently reflects an OECD – non-OECD divide. Due to the ease of which owners of vessels and floating oil and gas units can circumvent the law, as explained above, it has also proven difficult to ensure effective implementation of the Waste Shipment Regulation. More recently, however, several attempts of illegal trafficking have been halted, and several cases of illegal exports are under criminal investigation. For the first time in March 2018 a ship owner was held criminally liable by the Court of Rotterdam for having had the intent to scrap four ships in India.

DIAMOND OFFSHORE PLATFORMS UNDER INVESTIGATION

On 12 January, 2018, the Scottish Environment Protection Agency (SEPA) detained the three vintage Diamond Offshore MODUs "Ocean Nomad" (1975), "Ocean Princess" (1975), and "Ocean Vanguard" (1982) due to a suspicion of an attempt to illegally export the platforms under the Waste Shipment Regulation from Europe to Asia. The platforms were cold stacked at Cromarty Firth, and Diamond Offshore had sold the three rigs for scrapping to GMS, one of the largest end-of-life scrap dealers, also known as cash buyers. GMS specialises in the re-selling of vessels for scrapping to the South Asian beaching yards, but claimed that the three oldest North Sea MODUs had found a new operational contract. The long and risky transport of the MODUs from the North Sea to scrapping yards in South Asia was supposed to be done by heavy lifting vessels that had been contracted by GMS. These were forced to leave empty-handed, and today, more than a year after the arrest, the platforms are still detained in Scotland and the investigation is still ongoing.

British trade union RMT, strongly denounced Diamond Offshore and GMS' planned scrapping of the platforms at facilities that use the low-cost method of beaching: "These rigs are in the Cromarty Firth and could quite easily be dismantled and recycled at local facilities in Scotland," said RMT National Secretary, Steve Todd.

THE HONG KONG CONVENTION

In May 2009, the International Maritime Organisation (IMO) adopted the Hong Kong Convention on the Safe and Environmentally Sound Recycling of Ships. To date, the Convention has not yet entered into force.

Whereas the shipping industry upholds the Hong Kong Convention as the only solution for improving shipbreaking conditions globally, the Convention has been strongly criticised for not providing standards that will ensure safe and environmentally sound ship recycling by NGOs globally, the UN Special Rapporteur on Toxics and Human Rights, European policy makers and the majority of developing countries party to the Basel Convention.

Another major weakness is that the Convention relies on flag state jurisdiction and is thus prone to circumvention by flag-hopping at end-of-life to non-Party flags. Indeed, today, grey- and black-listed end-of-life flags of convenience (FOCs) such as St Kitts and Nevis, Palau and Comoros are particularly popular with scrap dealers for last voyage sailings to breaking yards. These are flags known for their poor implementation of international maritime law.

EUROPEAN SHIP RECYCLING REGULATION

The European Ship Recycling Regulation (EU) No 1257/2013 became applicable on 31 December 2018. The Regulation sets requirements for environmental protection and worker's health and safety that go beyond the Hong Kong Convention, and also regulates the management of wastes downstream. The European Union maintains a list of approved facilities globally, and EU-flagged commercial vessels, including floating oil and gas structures, are required to be recycled in a facility that is on the EU List.

To be included on the European List, ship recycling facilities, irrespective of their location, have to comply with a number of safety and environmental requirements. The EU List thus functions as an important market differentiator for yards that have already invested in proper occupational safety and environmental standards. Whilst facilities operating in the EU are approved by their national authorities for listing, the European Commission

assesses applications received from the ship recycling facilities located in third countries.

To ensure legal clarity and avoid administrative burden, ships covered by the new legislation are excluded from the scope of the Waste Shipment Regulation. Non-EU flagged vessels sold for scrapping whilst in European waters remain, on the other hand, covered by the Waste Shipment Regulation.

A major shortcoming of the Ship Recycling Regulation is that its scope is limited to EU flagged vessels – of which there are very few at end-of-life – and that owners can circumvent the law by simply swapping their EU flag to a non-EU flag at end-of-life. Only measures that go beyond flag state jurisdiction, such as for example a financial incentive introducing a return-scheme for ships, would effectively be able to hold owners accountable for environmental and social protection.

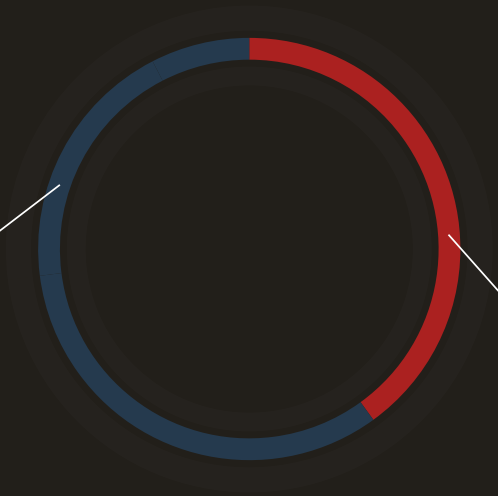
2015 - 2018 Scrapping Records
Historical Facts and Figures

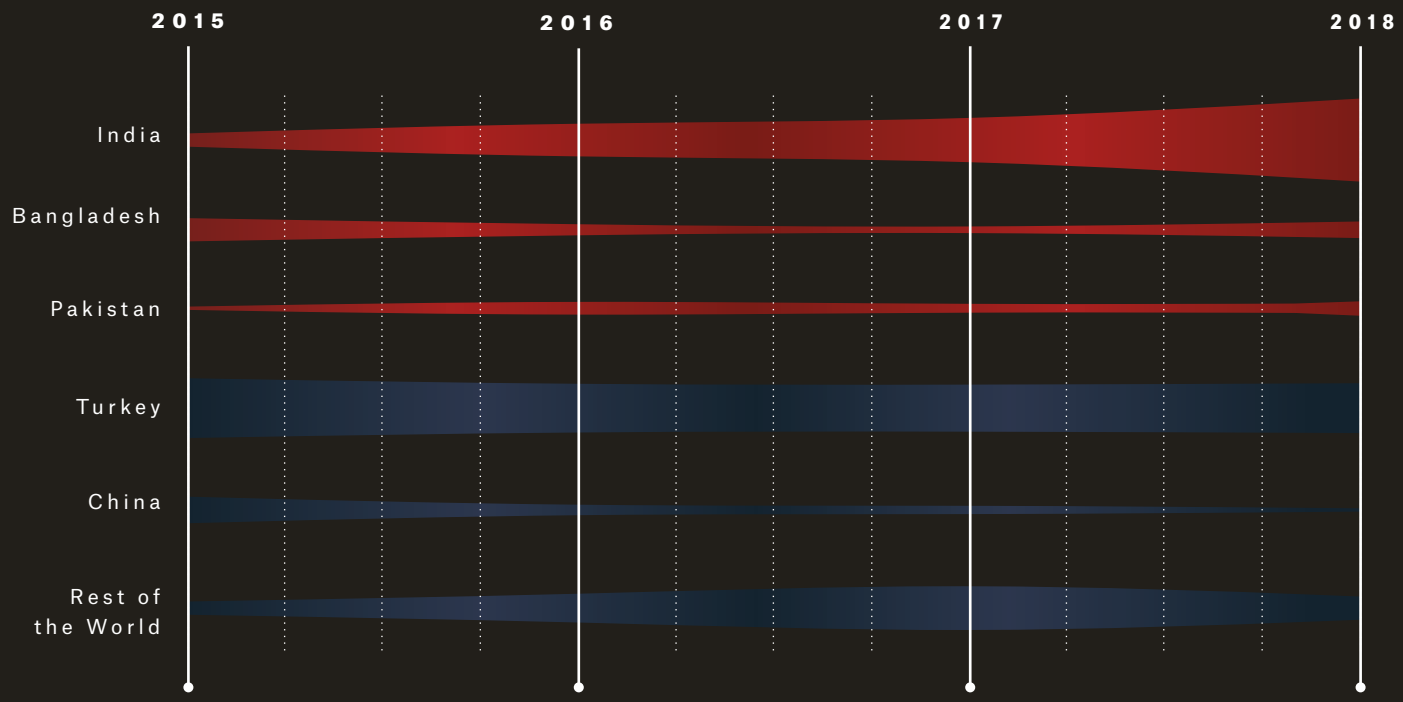
The O&G demolition market is dominated by a small number of countries globally. The top scrapping destinations for oil and gas units are South Asia and Turkey, which have carried out 79% of all scrapping operations in the last four years. Out of the 185 oil and gas assets which have been identified as broken up since 2015, 79 ended up on the beaches of South Asia (see Annex I). Figures do not include offshore tugs and safety standby vessel.

Turkey is the main destination for North Sea floating offshore units. Three yards located in Aliaga have been recently included in the EU List of approved ship recycling facilities.

The beach of Alang in India is the largest breaking spot globally. Along a 10 km long beach hundreds of vessels are scrapped in the intertidal zone annually. So far two yards in Alang have been audited by the EU and were not found to comply with the EU requirements and thus not included on the EU List.

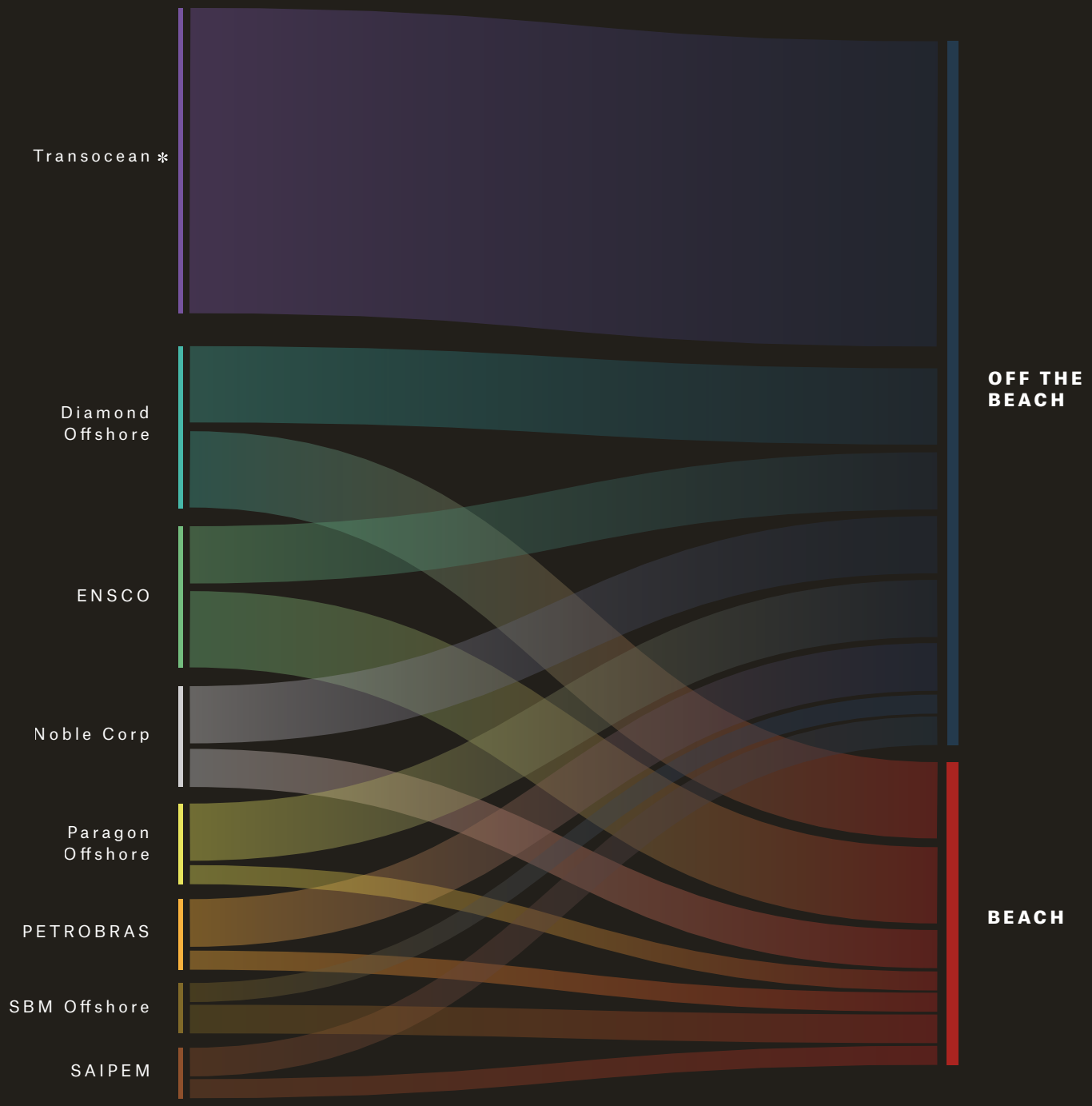
Starting in 2019, China has imposed a ban on the import of waste, which applies also to the import of foreign vessels for scrapping purposes.





CORPORATE RECORDS

Diamond Offshore, ENSCO, Noble Corporation, Paragon Offshore, Petrobras, SAIPEM and SBM Offshore are amongst the biggest offshore players that dump their assets on South Asian beaches.



* Transocean, which for years has sold its old assets to facilities in Turkey and China, sold the semi-submersible platform Jack Bates to an Indian facility in 2019.

THE HUMAN AND ENVIRONMENTAL COSTS OF BEACHING

Compared to sinking or abandonment, recycling is the only environmentally-friendly way of getting rid of old ships and floating structures because it ensures the reuse of valuable resources such as steel. However, ship and rig recycling is a heavy and hazardous industry that exposes workers, the environment and communities to a great number of risks. These include exposure to toxic materials – such as asbestos, heavy metal compounds, toxic residues – which lead to long term health diseases and irreversible environmental damage.

In 2018, 86% of the world's end-of-life tonnage, including oil and gas structures, was broken under rudimentary conditions on South Asian beaches. Beaching is the process in which a vessel is laid on a tidal mudflat for breaking. The vessel is grounded deliberately during high tide and breaking operations usually take place during low tide when the vessel is not submerged by the sea.

Shipbreaking on beaches has been declared the most dangerous job in the world by the International Labour Organisation. Carried out in large part by the informal sector, shipbreaking is rarely subject to occupational health and safety controls or inspections. Explosions, falls from great heights and dropping steel parts severely injure and even kill workers. In 2018, 35 deaths and 39 injuries at the South Asian shipbreaking yards were reported. The situation is worsened by the fact that in the vicinity of the shipbreaking beaches there are no hospital facilities capable of providing the necessary treatment to severely injured workers. Many workers, who's lives could have been saved, succumb to their injuries on the way to the nearest hospital.

Beaching yards furthermore do not have the proper infrastructure, equipment and procedures to fully contain and control pollution and to safely handle and dispose of hazardous waste. Currents and tides distribute the pollutants along the coast. This causes serious environmental harm with long-term effects for occupational, public and environmental health. Oil residues are mixed with seawater, causing damage by reducing light intensity beneath the water surface. Pollutants affect marine biodiversity and alter permanently the physiochemical properties of the coastal habitat. Dozens of aquatic species have been killed, destroying the livelihoods

of surrounding fishing communities. Blow-torch cutting through layers of paints that contain heavy metals and other toxics pollutes the air and exposes workers to toxic fumes. Burning of cables and release of ozone depleting substances also cause air pollution. In South Asia, the re-rolling of steel is preferred to smelting. Whilst the first is less energy consuming, re-rolling steel plates covered with paints releases toxic fumes and is yet another source of serious pollution.

Indian beaching yards have almost all obtained privately issued Statements of Compliance with the Hong Kong Convention (HKC SoCs) and use these to claim that they operate in line with international requirements. However, whilst some yards have built concrete floors for secondary cutting, the primary cutting still happens in the intertidal area causing pollution. On-site inspections of facilities in Alang that have applied for approval under the EU Ship Recycling Regulation have revealed serious failures with regards to ensuring basic safety and environmental standards at the yards, including lack of containment for pollutants in the intertidal zone, poor downstream waste management and breaches of labour rights. None of the Alang beaching yards that have applied for inclusion on the EU list have been approved.

Priya Blue yard in Alang, India
© GO GREEN GO INDIA - 2018

THE ROLE OF CASH BUYERS

Whilst the introduction and enforcement of the EU Ship Recycling Regulation may prompt a shift towards the use of more sustainable yards, unscrupulous scrap dealers, known as cash buyers, typically change the flag of the vessels prior to scrapping. Flags such as St Kitts and Nevis, Comoros and Palau are particularly popular with cash buyers and the shift to these flags is a way of circumventing the EU Regulation.

Cash buyers such as GMS, Wirana and Best Oasis have close business ties to the shipbreaking yards in South Asia and almost exclusively re-sell vessels to beaching yards in Bangladesh, India and Pakistan. The higher price offered by cash buyers is a clear indicator that the vessel will be scrapped at a substandard yard.

Cash buyers typically purchase a vessel either "as is, where is" or "upon delivery". The former entails that the cash buyer is responsible for crewing and bringing the vessel to the breaking yard, whilst in the latter case, the sale occurs upon arrival to an agreed location, usually close to the breaking yard.

SPECIFIC RISKS RELATED TO THE DEMOLITION OF O&G STRUCTURES

TRANSPORTATION

Even though semi-submersibles and jackup rigs are mobile, they are not transported by their own capabilities to the scrapping yard. The heavy infrastructure is not designed for easy flow in water and water resistance thus causes manoeuvring difficulties. Therefore, MODUs are towed by tugs or lifted on top of a heavy lifting vessel.

If towed by tug, harsh weather conditions can cause severe manoeuvring difficulties, and the towing lines can possibly break. Lifting the asset on board a heavy lifting vessel (dry transport) is a safer and faster option, but the operation is costly. Both towing and heavy lifting however require an extensive amount of fuel and expensive insurances that can cost up to USD 1 million.

The data collected for this report shows that South Asia is not the preferred destination of MODUs that do not sail autonomously. Out of 121 semi-submersible platforms and jack-up rigs scrapped in the last four years, 'only' 37 ended up on beaches.

According to industry sources, an increase in demand for heavy lifting vessels could push transportation costs down, therefore provoking a spike in numbers of assets scrapped in the South Asia. Should the transportation of semi-submersibles and jack-ups become cheaper, it is more likely that owners will opt to send their assets from the North Sea to South Asia.

As for oil and gas related units that are structurally more similar to conventional ships, out of 46 drill ships and FPSOs/FSOs scrapped in the last four years, 33 were beached in South Asia, including units owned by Shell, SAIPEM, Odebrecht, Maersk and SBM Offshore.

TRANSOCEAN WINNER GROUNDING OF RIG

The semi-submersible Transocean Winner was on its way to be scrapped in Turkey when the tug boat ALP Forward lost control over the platform due to severe weather conditions. ALP Forward tried to manoeuvre the platform away from the shore when the towing line broke. The platform grounded on the Isle of St. Lewis in Scotland. Prior to sending the vessel to Turkey, Transocean received quotes from yards in Northern Europe for an environmental friendly and safe decommissioning.

Towing old platforms come with higher risks due to a number of factors:

- Loss of knowledge about infrastructure
- Inconsistency in engineering drawings
- Blocked sounding tubes
- Broken tank gauging systems
- Non-operational cranes
- General decay and rust

Workers dismantling ships, including SAIPEM's unit Perro Negro 3, in Alang, India
© **REUTERS/AMIT DAVE** - 2018

CUTTING PROCESS

The preparation for the breaking process of a floating oil and gas structure is basically the same as the one for regular ships. The structure has to be cleaned from its hazardous substances before being cut in pieces. However, there are some specific risks related to the cutting operations that workers have to be aware of. MODUs and regular ships do not have the same type of structure, breaking oil and gas units thus requires specific training and competence. Due to the absence of a hull, the MODU itself does not provide any containment while breaking.

Workers prepare to tie a rope to a decommissioned oil rig to dismantle it in Alang, India
© REUTERS/AMIT DAVE - 2018

BEACHING PROCESS

MODUs differ from regular ships also due to the presence of a subsea structure, which, depending on its size and shape, might render beaching highly dangerous. For instance, experts signalled that certain designs of spudcans, which are the cones mounted at the base of a jack-up to provide stability, render beaching highly risky, and even impossible, as there is not sufficient water depth at arrival point. Futhermore, in most cases the unit will be beached up to 3km from the yard.

NORM

Most of the hazardous materials found on ships are also found on oil and gas structures. However, there are some additional materials that pose additional challenges. What is unique for oil and gas extraction units is that scale including naturally occurring radioactive material (NORM) can coat the inside of the storage, transportation and production equipment.

NORM-scale consists of radioactive elements contained in oil and gas when it is extracted. High levels of NORM were first documented in 1981 in the production systems of all the main oil and gas fields in the North Sea[6]. Indeed, NORM is especially prominent in the North Sea basin.

Exposure to ionizing radiation poses risks to workers' health, the public and the environment[7]. The risk of exposure during decommissioning is high. All workers dismantling contaminated structures must therefore have the adequate training and safety equipment. Parts containing NORM have to be cleaned, handled and disposed in a controlled manner at facilities that are licensed to handle radioactive waste.

6. T. Strand, NORM in the Norwegian Oil and Gas Industry – Activity Levels, Occupational Doses and Protective Measures
7. Ibid

NORTH SEA PRODUCER
NORM-CONTAMINATED FPSO

The FPSO tanker North Sea Producer was deployed in the McCulloch field in the North Sea for 17 years. It was owned by the North Sea Production Company, a single-ship joint venture between Danish Maersk and Brazilian Odebrecht. Once the field closed, the unit was laid up in Teesport, UK.

It left the UK in May 2016 and was directly towed to Bangladesh, where it was beached at the Janata Steel shipbreaking yard. Following a conjunction issued by the Bangladesh Supreme Court after the discovery of NORM, the yard is still waiting to obtain the permission to break the ship. The tanker's export from the UK to Bangladesh was illegal under the EU Waste Shipment Regulation. Whilst Maersk claims that they sold the vessel to the St Kitts and Nevis registered post-box company Conquistador Shipping Corporation for further operational use in the Tin Can Island Port in Nigeria, it was revealed that the buyer was GMS, one of the world's largest scrap dealers for end-of-life ships. Taking the current market conditions into account, it was highly unlikely that Maersk was able to find a new owner for the ship within the oil and gas sector.

UK environmental authorities are currently investigating the case to assess liability for the illegal export.

MERCURY

In addition to heavy metals such as lead, cadmium, zinc and copper that are found in e.g. paints, coating, insulation, batteries and electrical compounds, oil and gas structures may also be contaminated by mercury.

Mercury is a naturally occurring element present in virtually all oil and gas fields. Concentrations are especially high in the South American and East Asian region.

Like NORM, mercury can contaminate the hydrocarbon processing equipment of offshore units and ballast waters. On board, it can also be found in thermometers, electrical switches, level switches and light fittings. Mercury is considered one of the top ten chemicals of major public health concern by the World Health Organisation. Exposure to low levels of mercury vapour can cause serious health problems. Exposure to high levels can deeply harm the nervous, digestive and immune systems and organs like lungs and kidneys.

Mercury cannot be removed from the steel mill scrap feed after the recycled material has been crushed or shredded, which means that mercury-contaminated materials need to be decontaminated at an early stage of the recycling process. If not identified prior to scrapping, risks for workers and the environment are high.

3 The outlook for Oil & Gas recycling in the North Sea

Out of the 185 floating structures which have been identified as scrapped between 2015 and 2018, 79 ended up on South Asian beaches (see Annex I). This is a stark increase of beached offshore structures if compared to trends of previous years. Figures related to the first half of 2019 confirm a consistent growth of the demolition market for floating offshore structures with more than 30 units having already been scrapped. So far, the only structure which operated in the North Sea which has been traced to a South Asian beaching yard is the North Sea Producer[8]. There is a real risk, however, that we will see more of these cases coming up in the near future with more decommissioning projects in the North Sea.

WHAT SET OF RULES FOR THE NORTH SEA COLD AND WARM STACKED ASSETS?

Authorities are increasing their efforts to hold companies liable for the illegal trafficking of ships for dirty and dangerous scrapping on the South Asian beaches. In March 2018, the first ever criminal indictment of a shipping company for having intended to scrap four vessels in India shook the entire industry. More cases are currently being investigated, including the case of the three Diamond Offshore platforms that were sold to cash buyer GMS and are currently under arrest in Scotland[9].

8. *See page 30*
9. *See page 19*

While approximately 20% of the platforms currently drilling in the North Sea have EU flags, only one of the cold stacked units and only three of the warm stacked are registered under an EU flag. Due to their EU flag they will be covered by the EU Ship Recycling Regulation and therefore need to find a recycling destination that has been approved by the EU. The remaining 29 stacked units that do not have an EU flag are primarily registered under the flags of Bahamas, Panama and Marshall Islands. These units fall under the scope of the EU Waste Shipment Regulation: 18 are stacked in Norway, 9 in the UK, and 2 in the Netherlands[10].

10. *Bassoe Offshore, July 2019*

GREEN CAPACITY IN THE NORTH SEA

North Sea recycling yards have years of experience decommissioning fixed oil and gas structures. Within the framework of the OSPAR Convention, national authorities and the industry have effectively worked together to ensure that research and technology developments have contributed to rising standards, increased efficiency and cost reductions.

AF Gruppen recycling facility in Norway

Many EU Member States have dry docks and contained slipway facilities where the dismantling of floating structures can take place safely and with due regard for labour and environmental concerns.

Prompting innovative handling and recycling technology, decommissioning also brings opportunities for the many workers that were laid off after the recession in the oil and gas sector in 2014. Enhancing the recycling of offshore structures and ships in Europe would furthermore be a way of recovering second hand steel which can be re-used in the European market, in line and answering to the needs of a circular economy, and in support of an industry which accounts for 1.3% of the EU's GDP.

Whilst recycling in a safe and clean way will bring extra costs to the recycling yard as it has to invest in e.g. infrastructure and pay for the environmentally sound disposal of hazardous wastes, it is expected that Research & Development on the use of new technologies can render operations more cost effective.

ADVANTAGES OF USING NORTH SEA YARDS FOR UNITS IN THE AREA

Short transportation
Use of existing expertise on the recycling of fixed structures for the floating units
Environmentally sound management, storage and disposal of hazardous wastes
High recycling levels
Contribution to a green circular economy
Prompts socio-economic opportunities, including green jobs
Existing industry clusters secure R&D for cost effectiveness

PREFERRED RECYCLING METHODS FOR OIL & GAS UNITS

Oil and gas structures vary greatly in size, weight and structure. Hence, suitable breaking methods and locations have to be chosen on a case-by-case basis.

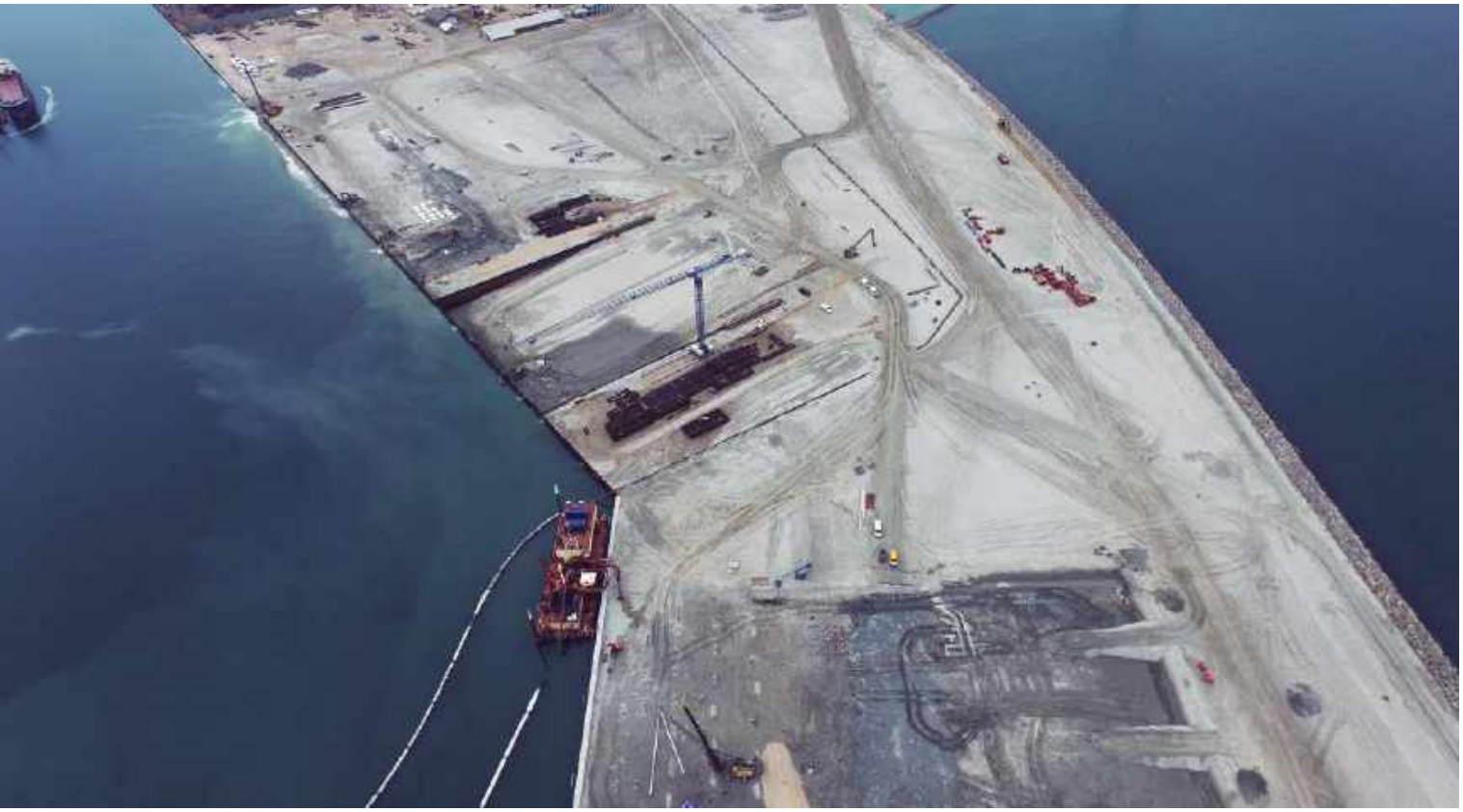
Alongside

Alongside is a recycling method mainly used in China, Europe and United States. The vessel is brought along a wharf or quay in a sheltered harbour or river, and dismantled by cranes from top to bottom. For ship-shaped assets, cutting operations proceed until the lower part of the hull can be lifted out in one piece, pulled up a slipway for final cutting in a fully contained area. For platforms, the risk of spilling hazardous material is far greater, since the asset does not have a hull and is cut partly or wholly in the water.

Single lifting

The whole asset is lifted onshore and dismantled thereafter. This method demands heavy lifting tool, and there are a restricted number of yards that have the infrastructure capable of lifting the heaviest structures.

Recycling facility under construction in Denmark
© Frederikshavn Havn



Dry-dock

Dry-docks are mainly used in Europe and China. The unit is driven to an enclosed, flooded dock, the water of which is subsequently pumped out. The asset is then dismantled piece by piece in a fully contained area, thereby minimizing the risk of environmental pollution and allowing for the use of cranes to lift heavy pieces. Dry-docks are suitable for structures with considerable below-waterline components.

OWNERSHIP AND RESPONSIBILITY AT END-OF-LIFE

In most cases, a fixed platform is owned by the oil and gas company that also operates it. This company is the responsible party for the end-of-life management of the asset. On the other hand, oil and gas companies lease floating units from different asset owners. Whilst the oil and gas company leasing the unit will take decisions regarding the operations, the unit is often managed by its owner, or by a third party contracted by the owner, and usually comes with its own crew, as well as the equipment and other supplies needed to carry out the designated operation. Floating units are, unlike fixed platforms, normally subject to several leasing contracts during their lifespan. When the leasing contract between the oil and gas company and the owner of the floating unit ends, the control of the asset returns to the latter. The owner is thus legally responsible for the asset's demolition.

Still, oil and gas companies that lease and use these assets, in some cases throughout most of their operational life, are in a position to influence the owners' final decision on demolition. All actors involved in the petroleum supply chain, directly or indirectly, have the power to positively influence their business partners' recycling decisions. Governments, insurers, investors and other financers also have the possibility to demand safe and clean recycling in contractual arrangements, or choose to only work with owners that have a clearly sustainable ship recycling policy in place.

Especially banks, pension funds and other financial institutions are increasingly asked to take into account social, environmental and governance criteria when selecting asset values or clients. Investing with

an eye to environmental or social issues, not just financial returns, the credit providers and investors of shipping are now actively taking a closer look at how they might contribute to a shift towards better ship recycling practices off the beach. In 2018, Scandinavian pension funds the Norwegian Government Pension Fund Global and KLP divested from shipping companies due to their beaching practices. Both the breach of international human rights and the severe environmental damage caused by beaching were highlighted as reasons for the divestments.

The upcoming decommissioning in the North Sea is an opportunity for sustainable recycling and associated green jobs. As called for by European policy makers, the offshore industry should lead the way on ensuring "black gold's green legacy". Financiers can play an important role in ensuring the shift towards sustainable practices by also reaching out to the offshore companies in their portfolios that have units that are likely to be scrapped in the next coming years.

Damen Verolme Rotterdam ship recycling facility
© DAMEN/Offshore Ship Recycling Rotterdam (OSRR)

Prime Decommissioning Candidates owned by Major Offshore Operators

The selection of prime candidates for decommissioning is based on age (<2001) and status (warm/cold) as per data NGO Shipbreaking Platform/Bassoe Offshore (July 2019).

AWILCO — 1

Cold
Stacked: 1

BORR DRILLING — 0

COSL — 1

Warm
Stacked: 1

DIAMOND OFFSHORE — 2

Cold
Stacked: 2

DOLPHIN DRILLING — 4

Cold
Stacked: 3
Warm
Stacked: 1

ENSCO ROWAN — 5

Cold
Stacked: 4
Warm
Stacked: 1

JAPAN DRILLING — 0

MAERSK DRILLING — 1

Warm
Stacked: 1

Cold
Stacked: 2
Warm
Stacked: 1

3

NOBLE

0

PARAGON

Cold
Stacked: 2

2

SAIPEM

Cold
Stacked: 4

4

SEA DRILL

Cold
Stacked: 1
Warm
Stacked: 8

9

SHELF DRILLING

0

SONGA OFFSHORE

0

STENA

Cold
Stacked: 6

6

TRANSOCEAN

ANNEX I
2015 - 2018 Scrapping Records

OWNER	IMO#	NAME	TYPE	DESTINATION	YEAR
African Gulf	7411557	SKARPOV	Gas Processing Ship	India	2017
AOG Group	8755534	HERCULES 252	Jack-up	USA	2016
Atwood Oceanics	8750869	ATWOOD EAGLE	Semi Submersible	China	2017
Atwood Oceanics	8750883	ATWOOD FALCON	Semi Submersible	China	2016
Atwood Oceanics	8750900	ATWOOD HUNTER	Semi Submersible	Turkey	2015
Augustea Group	8874524	AMT TRADER	Deck Cargo Pontoon	Turkey	2018
BAHRI	9050589	FRIDAY	FSO	Pakistan	2016
Bennu Oil & Gas	8754633	INNOVATOR	Semi Submersible	India	2018
Borr Drilling	8751100	ED HOLT	Jack-up	India	2018
Bumi Armada	9183439	TREPID	FPSO	India	2017
Chevron Corp	7372270	BENCHAMAS EXPLORER	FSO	China	2018
China National Offshore Oil	7008855	NANHAI KAI TUO	FPSO	Bangladesh	2015
Compass Energy	8792116	ENERGI 1	Jack-up	Bangladesh	2017
Crowley Maritime Corp	8642531	TMT FORTALEZA	Deck Cargo Pontoon	USA	2018
Delta Al Muhitat Shipping	8754786	KARON 1	Jack-up	Pakistan	2018
Diamond Offshore	7714313	CLIPPER	Drilling Ship	India	2016
Diamond Offshore	8750077	ELBA	Semi Submersible	India	2018
Diamond Offshore	8750871	EPOCH	Semi Submersible	India	2015
Diamond Offshore	8750895	GENERAL	Semi Submersible	India	2016
Diamond Offshore	8752972	LANCE	Semi Submersible	India	2018
Diamond Offshore	8753108	QUEST	Semi Submersible	India	2017
Diamond Offshore	8753275	SPUR	Jack-up	India	2017
Diamond Offshore	8753342	VICTORY 1	Semi Submersible	India	2018
Diamond Offshore	8755807	OCEAN CONCORD	Semi Submersible	Turkey	2015
Diamond Offshore	8755833	OCEAN WINNER	Semi Submersible	Turkey	2015
Diamond Offshore	8755742	OCEAN YATZY	Semi Submersible	Turkey	2015
Diamond Offshore	8752556	OCEAN AMBASSADOR	Semi Submersible	USA	2016
Diamond Offshore	8755821	OCEAN LEXINGTON	Semi Submersible	USA	2015
Diamond Offshore	8755845	OCEAN SARATOGA	Semi Submersible	USA	2017

Diamond Offshore	8755388	OCEAN STAR	Semi Submersible	USA	2017
Diamond Offshore	8755883	OCEAN YORKTOWN	Semi Submersible	Unknown	2015
ENSCO	9193630	LADS-1	Drilling Ship	India	2016
ENSCO	9193642	LADS-2	Drilling Ship	India	2016
ENSCO	8750730	NELSON	Semi Submersible	India	2016
ENSCO	8751083	OCTOPUS	Semi Submersible	India	2015
ENSCO	8751069	SMILE	Jack-up	India	2017
ENSCO	8752960	SMILE 5	Semi Submersible	India	2018
ENSCO	8751136	ENSCO 94	Jack-up	Pakistan	2017
ENSCO	8751784	NSC 9	Jack-up	Pakistan	2016
ENSCO	8764339	ENSCO 6003	Semi Submersible	Turkey	2016
ENSCO	8764341	ENSCO 6004	Semi Submersible	Turkey	2016
ENSCO	8765008	NSC 75	Semi Submersible	Turkey	2018
ENSCO	8764195	NSC60	Semi Submersible	Turkey	2018
ENSCO	8753835	ENSCO 90	Jack-up	USA	2017
ENSCO	8753885	ENSCO 99	Jack-up	USA	2017
Fred Olsen & Co	8758093	BORGHOLM DOLPHIN	Accommodation Platform	Turkey	2017
Fred Olsen & Co	8750534	BORGNY DOLPHIN	Semi Submersible	Turkey	2016
Fred Olsen & Co	8750546	BORGSTEN DOLPHIN	Semi Submersible	Turkey	2017
GSP	7409401	FALCON	Pipe Layer	India	2017
Gulf Drilling	8752506	ATLANTIC PLATA I	Jack-up	India	2018
Helix Energy Solutions Group	7403469	HELI	Drilling Ship	India	2017
Hercules Offshore	8751992	HERCULES 120	Jack-up	USA	2017
Hercules Offshore	8750572	HERCULES 153	Jack-up	USA	2017
Hercules Offshore	8752922	HERCULES 203	Jack-up	USA	2017
Hercules Offshore	8755405	HERCULES 206	Jack-up	USA	2017
Hercules Offshore	8751954	HERCULES 265	Jack-up	USA	2016
Hercules Offshore	8754451	HERCULES 85	Jack-up	USA	2017
Hercules Offshore	8750003	HERCULES 207	Jack-up	Unknown	2016
Hercules Offshore	8751899	HERCULES 211	Jack-up	Unknown	2016
Hitek Nusantara Offshore	8756411	TRINITY	Jack-up	India	2018

Japan Drilling	8751605	GAGA I	Semi Submersible	India	2018
Jasper Investments	7506467	DISCOVERER	Drilling Ship	India	2016
Jasper Investments	7305980	PERPLEX	Drilling Ship	India	2018
KCA Deutag Drilling	7611482	GLEN	Platform Supply Ship	India	2017
KGL Limited	8757192	S DLB	Pipe Layer	India	2018
Koole BV	8750340	ATLANTIC ROTTERDAM	Jack-up	Turkey	2018
Korea National Oil Corp	8751019	SUNG	Semi Submersible	India	2018
Maersk Drilling	8751980	MAERSK ENDURER	Jack-up	China	2015
McDermott International	7709069	DB	Maintenance Platform	Bangladesh	2015
Micoperi	8758706	CRAWLER	Pipe Layer	Turkey	2017
Moller AP	8124058	PRODUCER	FPSO	Bangladesh	2016
Nabors Marine	8751007	DOLPHIN 106	Jack-up	Unknown	2015
Nabors Marine	8755716	DOLPHIN 109	Jack-up	Unknown	2016
Nabors Marine	8752752	DOLPHIN 110	Jack-up	Unknown	2016
NAFTAPLIN	7942037	ZAGREB 1	Semi Submersible	Turkey	2016
Nathalin	9006605	A STAR	FSO	Bangladesh	2018
New Shipping	9131113	HORIZON 1	FPSO	Bangladesh	2018
Nigeria Govt	7388700	ZUMA	FSO	Bangladesh	2015
Noble Corp	8756277	NOBLE PAUL WOLFF	Semi Submersible	Bangladesh	2015
Noble Corp	8756253	MAX	Semi Submersible	China	2017
Noble Corp	6608608	DISCOVERER	Drilling Ship	India	2016
Noble Corp	8756564	M1161	Jack-up	India	2018
Noble Corp	8752609	RIG L 786	Jack-up	India	2018
Noble Corp	8752192	NOBLE DRILLER	Semi Submersible	USA	2016
Noble Corp	8756291	NOBLE JIM THOMPSON	Semi Submersible	USA	2015
Noble Corp	7422362	PARAGON DPDS2	Drilling Ship	USA	2017
Noble Corp	5315474	PARAGON DPDS3	Drilling Ship	USA	2017
Noble Corp	8750247	PARAGON L1116	Jack-up	USA	2018
Norscot Drilling	7367457	PENTAGON 5000	Semi Submersible	India	2018
Norscot Drilling	8754061	POLYGON PRODUCER	Semi Submersible	India	2018
Northern Offshore	5203554	SEARCHER	Drilling Ship	India	2016
Opus Offshore	8755376	8ONGA MERCUR	Semi Submersible	Bangladesh	2018
Opus Offshore	8755613	SONGA VENUS	Semi Submersible	India	2018
Paragon Offshore	8752855	SLO 1	Accommodation Platform	Pakistan	2018
Paragon Offshore	7907178	DPDS4	Drilling Ship	India	2016

Paragon Offshore	7347433	PARAGON MSS2	Semi Submersible	Puerto Rico	2017
Paragon Offshore	8756239	PARAGON B301	Jack-up	USA	2018
Paragon Offshore	8751576	PARAGON L1113	Jack-up	USA	2018
Paragon Offshore	8754798	PARAGON L1114	Jack-up	USA	2018
Paragon Offshore	8755572	PARAGON L781	Jack-up	USA	2018
Paragon Offshore	8755663	PARAGON M821	Jack-up	USA	2018
PETROBRAS	8753653	PETRO X	Semi Submersible	India	2018
PETROBRAS	5284211	RAS X	FPSO	India	2018
PETROBRAS	8754023	BRAS X	Semi Submersible	Turkey	2017
PETROBRAS	8754085	BRAS XVI	Semi Submersible	Turkey	2017
PETROBRAS	8754097	BRAS XVII	Semi Submersible	Turkey	2017
PETROBRAS	8753988	PETROBRAS V	Jack-up	Turkey	2015
PETROBRAS	8754114	PETROBRAS XXIII	Semi Submersible	Turkey	2018
Petrofac Services	7219909	UNITY	FPSO	India	2017
Petroleo Constellation	8750089	ALASKAN	Semi Submersible	Turkey	2017
Petronas	7913476	ABU	FSO	India	2018
Pride International	8325248	NSC	Maintenance Platform	Turkey	2016
Prosafe SE	8755091	TORI	Semi Submersible	India	2018
Repsol Oil & Gas Canada	7347706	BUCHAN A	Semi Submersible	United Kingdom	2017
Rowan Companies	8750699	CECIL PROVINE	Jack-up	Unknown	2017
RV International DMCC	8750936	NUGGET	Jack-up	India	2018
SAIPEM	8753914	EGRO	Jack-up	India	2018
SAIPEM	8757790	TORO	Pipe Layer	India	2016
SAIPEM	8754956	RABEO	Semi Submersible	Turkey	2017
SAIPEM	8750352	RABEO 6	Semi Submersible	Turkey	2017
SAIPEM	8754968	SCARABEO 4	Semi Submersible	Turkey	2015
Sapura Energy	8645739	BERKAT	Drilling Ship	Bangladesh	2018
SBM Offshore	7360849	FPSO BRASIL	FPSO	China	2015
SBM Offshore	7714959	TAG	FSO	India	2018
SBM Offshore	7373092	FALCON	FPSO	India	2016
SBM Offshore	7360148	MARLIN	FPSO	India	2017
SBM Offshore	7391185	KUITO	FPSO	Turkey	2015
Seaport International Shipping	7420546	SIS SEEKER	Well-Stimulation Vessel	Pakistan	2018
SEREPT	8765620	IFRIKIA II	FSO	Turkey	2017
Seroja Investments	8021830	ACES	FSO	Pakistan	2016

Shelf Drilling	8756162	RIA	Jack-up	Bangladesh	2016
Shell-Royal Dutch Group	5330412	NIO	FSO	India	2015
Songa Offshore	8752271	SONGA TRYM	Semi Submersible	Turkey	2018
Subsea 7	8207836	KOMMANDOR 3000	Pipe Layer	Turkey	2018
Subsea 7	8111879	SEVEN CONDOR	Pipe Layer	Turkey	2018
Trada Maritime	7925730	LENTERA BANGSA	FSO	Pakistan	2016
Transocean	8764585	DEEPWATER EXPEDITION	Drilling Ship	China	2015
Transocean	7420510	DISCOVERER SEVEN SEAS	Drilling Ship	China	2015
Transocean	7233292	GSF EXPLORER	Drilling Ship	China	2015
Transocean	8754918	GSF RIG 140	Semi Submersible	China	2017
Transocean	8750223	M. G. HULME, JR	Semi Submersible	China	2016
Transocean	8755156	SEDCO 707	Semi Submersible	China	2015
Transocean	8753718	TRANSOCEAN LEGEND	Semi Submersible	China	2015
Transocean	8755431	TRANSOCEAN RATHER	Semi Submersible	China	2015
Transocean	8764846	CAJUN EXPRESS	Semi Submersible	Turkey	2018
Transocean	9203679	DEEPWATER DISCOVERY	Drilling Ship	Turkey	2018
Transocean	7112890	DEEPWATER NAVIGATOR	Drilling Ship	Turkey	2016
Transocean	9173630	DEEPWATER PATHFINDER	Drilling Ship	Turkey	2018
Transocean	8750091	GSF ALEUTIAN KEY	Semi Submersible	Turkey	2015
Transocean	8751320	GSF ARCTIC I	Semi Submersible	Turkey	2015
Transocean	8751332	GSF ARCTIC III	Semi Submersible	Turkey	2015
Transocean	8758067	GSF CELTIC SEA	Semi Submersible	Turkey	2015
Transocean	8752415	GSF GRAND BANKS	Semi Submersible	Turkey	2016
Transocean	8754891	GSF RIG 135	Semi Submersible	Turkey	2016
Transocean	8756318	J. W. MCLEAN	Semi Submersible	Turkey	2015
Transocean	8755118	SEDCO 702	Semi Submersible	Turkey	2016
Transocean	8755132	SEDCO 704	Semi Submersible	Turkey	2016
Transocean	8755182	SEDCO 710	Semi Submersible	Turkey	2015
Transocean	8764913	SEDCO ENERGY	Semi Submersible	Turkey	2018
Transocean	8764901	SEDCO EXPRESS	Semi Submersible	Turkey	2018
Transocean	8755247	SEDNETH 701	Semi Submersible	Turkey	2016
Transocean	8752582	TRANSOCEAN AMIRANTE	Semi Submersible	Turkey	2015
Transocean	8751021	TRANSOCEAN DRILLER	Semi Submersible	Turkey	2016
Transocean	8752025	TRANSOCEAN JOHN SHAW	Semi Submersible	Turkey	2016
Transocean	8757960	TRANSOCEAN MARIANAS	Semi Submersible	Turkey	2018

Transocean	8753706	TRANSOCEAN PROSPECT	Semi Submersible	Turkey	2017
Transocean	8754487	TRANSOCEAN SEARCHER	Semi Submersible	Turkey	2017
Transocean	8756320	TRANSOCEAN WINNER	Semi Submersible	Turkey	2016
Unknown	7389065	BA VI	FPSO	Bangladesh	2015
Unknown	8764353	CRYSTAL ORCA I	Drilling Ship	Bangladesh	2017
Unknown	8755601	ISMAYA	Pontoon	Bangladesh	2016
Unknown	7517882	OLO	FSO	Bangladesh	2015
Unknown	7907180	PEREGRINE I	Drilling Ship	Bangladesh	2015
Unknown	8756150	ADRIATIC I	Jack-up	India	2017
Unknown	8413863	SEILLEAN	FPSO	India	2015
Unknown	8753677	WORKER	Semi Submersible	India	2018
Unknown	7929683	ENERGY R	FSO	Pakistan	2015
Unknown	8751497	NSC 3	Jack-up	Pakistan	2017
Unknown	8752489	NSC 5	Jack-up	Pakistan	2016
Unknown	8753691	DEBORAH	Accommodation Platform	Turkey	2018
Unknown	8759176	HIB	Accommodation Platform	Turkey	2017
Unknown	8758847	TAY	Semi Submersible	Turkey	2017
Unknown	7418880	PARAGON DPDS1	Drilling Ship	USA	2017
Unknown	8754839	SEA DIAMOND	Jack-up	Unknown	2017
Ves Fair Marine	7349754	GIANT	Pipe Layer	Bangladesh	2018

Data sourced by NGO Shipbreaking Platform.
To consult the complete dataset please visit www.shipbreakingplatform.org.