Shades of Green

A stakeholder analysis of the ship recycling industry and its challenges

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Abstract

This paper aims to answer the question of how sustainable ship recycling (SSR) is perceived by industry stakeholders, and how it has been codified into regulation and implemented in the ship recycling industry. To answer this question, we utilize a case study methodology, using mixed method qualitative data collection methods to gather data from industry stakeholders. We then conduct a stakeholder analysis based on stakeholder groups identified by relevant literature, ranging from shipowners and shipbreakers, to national and international regulators, to financiers and NGOs, among others. We collect data from stakeholders on their views on the industry, the sustainable ship recycling concept, the industry's regulatory framework, and how the SSR principle has been implemented by shipowners and shipbreakers. This paper finds that stakeholders in the ship recycling industry perceive social and environmental sustainability to be of main importance in considering sustainable ship recycling. The main pieces of regulation in this industry, the Hong Kong Convention and the EU Ship Recycling Regulation mirror this perception in their core purpose and regulatory texts. Furthermore, we find that though stakeholders are concerned with the effectiveness of existing regulation, they are generally positive towards the regulations and optimistic about its potential to improve the industry. Finally, we find that among the stakeholders considered in this research, significant efforts have been made to implement sustainable ship recycling practices in the industry.

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1. Introduction

Ships are used to transport 80% of global trade by volume. As of early 2018, there were over 90,000 vessels in the world merchant fleet, with a combined tonnage of 1.92 billion deadweight tons (dwt) (UNCTAD, 2018). On average, they have an economic life of 20-30 years, after which the owner looks to dispose of it. The most common way to do this is generally ship recycling. Ship recycling is defined as "the process of dismantling a vessel, generally after its service period, for disposal, recycling, or recovery of its structural components" (John & Srivastava, 2018, p. 45). The term ship recycling is used interchangeably with shipbreaking, ship scrapping, and ship dismantling, with the terminology depending on the organization using it (Mishra, 2018).

When a ship is recycled, as much as 95% of materials and equipment on it can be recovered, making the industry highly sustainable in theory. End-of-life (EOL) ships are taken to a recycling facility, taken apart piece by piece, and most parts of the ship are reused (e.g. furniture, equipment) or recycled (e.g. scrap steel, which can be re-rolled and used for other purposes) (Rousmaniere & Raj, 2007; Sujauddin et al., 2014). Ships are primarily recycled in three locations: India, Bangladesh, and Pakistan. Of the 23 million gross tons (GT) sent for recycling in 2017, 17.5 million GT landed on the beaches in these three countries (UNCTAD, 2018).

The shipbreaking industry creates immense economic value in these countries. In Bangladesh, scrap steel from shipbreaking accounts for approximately 70% of domestic steel demand, and creates both direct and indirect employment opportunities for thousands of people (S. M. Rahman, Schelly, Mayer, & Norman, 2018). However, it is known as one of the dirtiest industries in the world, and it has long been associated with issues such as human rights violations in regards to wages (Frey, 2015; Kutub, Falgunee, Nawfee, & Rabby, 2017; Sahu, 2014), workplace safety (Devault, Beilvert, & Winterton, 2017; Hossain, Chowdhury, Jabbar, Saifullah, & Rahman, 2008; International Labour

Organization [ILO], 2004; Occupational Safety and Health Administration [OSHA], 2010), and environmental pollution (Demaria, 2010; Human Rights Council [HRC], 2009; Puthucherril, 2010).

These issues are widely associated with beaching, which is the shipbreaking method used in India, Pakistan, and Bangladesh. It consists of landing a ship on the beach during high tide, and taking it apart when the tide recedes (Lloyd's Register, 2011). Since these three countries account for over 80% of global ship recycling activity, efforts to regulate poor conditions in the industry have focused on the practice of beaching (UNCTAD, 2018). Three key pieces of international regulation govern the ship recycling industry: the 1989 Basel Convention, the 2009 Hong Kong Convention (HKC), and the 2013 EU Ship Recycling Regulation (EU-SRR). Out of these three, the Hong Kong Convention is awaiting ratification and is not currently in effect. However, regulation in the industry has been considered to be largely ineffective due to the lack of a single global regulatory instrument for ship recycling. This is discussed in detail in section 2.3.

The ship recycling industry is made up of a vast network of stakeholders all around the world, with different interests. Shipowners sell their ships to cash buyers to recover some of their investment, which then sell the ship to a ship recycling yard. The ship recycling yard owner has low profit margins and the market is extremely volatile, depending both on the supply of ships for scrapping and the price of scrap steel. They try to keep costs low by recycling in rudimentary conditions and using cheap, migrant labor. The mere action of having a ship leave a port on its final journey involves several countries: the port state (that the ship is sailing from), the recycling state (that the ship is sailing to), one or more flag states (depending on whether the ship is reflagged prior to recycling), as well as the countries that the shipowner and cash buyer operate from. And these are only the stakeholders that may be involved in a single transaction. There are also national and international regulators, NGOs, shipbreaking workers and a number of other groups affected by the industry.

These stakeholders all have different views and opinions on the industry. For some, like the shipbreakers, it is their livelihood. For others, like the NGOs, it is an unregulated and unsafe industry. There is no consensus in the industry regarding how ship recycling should be carried out, or how it should be regulated. With this research, we aim to map out the different industry stakeholders, and to understand their worldview and perception of sustainable ship recycling (SSR), the regulatory framework around it, as well as their role and stake in the industry overall. We have thus decided to carry out a stakeholder analysis of the ship recycling industry, and have developed a research question we aim to answer:

> *How is the concept of sustainable ship recycling perceived by different stakeholders, and how has it been codified into regulation, and implemented by the ship recycling industry?*

This question allows us to examine stakeholders in terms of (1) the definition of SSR, (2) regulation around SSR (primarily the Hong Kong Convention and EU Ship Recycling Regulation), and (3) implementation of SSR in the industry. Since this is a three part question, we have broken it down into three sub-questions to facilitate structure and ensure that we can answer the full question at the end of this paper. These are:

> *SQ 1: How do stakeholders in the ship recycling industry perceive the concept of sustainable ship recycling?*
>
> *SQ 2: How has the concept of sustainable ship recycling been codified into regulation in the Hong Kong Convention and the EU Ship Recycling Regulation?*
>
> *SQ 3: How has the industry implemented the concept of sustainable ship recycling?*

We use the terminology "ship recycling" in our research questions as this is what is used by the Hong Kong Convention and the EU Ship Recycling Regulation. However, we do not distinguish between ship recycling, ship scrapping, and shipbreaking, and the terms are used interchangeably throughout this paper and understood to refer to the same process.

1.1. Delimitations

The shipbreaking industry is global, and there is a broad range of stakeholders to consider. In order to ensure that we would be able to collect sufficient data from the relevant groups, we chose to limit our scope in two ways: firstly, by focusing on Danish shipowners (and related stakeholder groups), and secondly, by focusing on beaching yards.

As an EU member and a prominent ship owning nation, Denmark is a suitable area of study. Its shipowners are affected by both the Hong Kong Convention and EU Ship Recycling Regulation, and there are a number of large shipping companies in different segments to collect data from. From the shipbreaker side, it is important to consider that beaching yards carry out over 80% of global ship recycling, as discussed above, and they are source of the industry's key environmental and social issues. These delimitations are discussed in further detail in section 5.2.

1.2. Research purpose

The shipping industry is the backbone of global trade. As the world starts to move toward making more environmentally and socially conscious choices in terms of the food we consume, the clothes we wear, and how often we fly, we should consider every step of the supply chain and what needs to be improved. Ship recycling is an invisible activity in global trade. First, it is invisible to the consumer, because the way we think about buying sustainable products rarely extends to the mode of transportation. And even if it did, shipping is still the least environmentally harmful way to transport goods. Second, ship recycling takes place after the ship's useful life, making the process far removed from consumer consciousness.

Furthermore, as mentioned earlier, ship recycling is a sustainable process in theory. The issue doesn't lie in the activity of recycling ships, but in the way we do it. There is also an added element of a power imbalance between shipowners in the Global North and shipbreakers in the Global South.

All of these factors drew our attention to the issue of shipbreaking. Our aim in undertaking this research is to shed some light on this industry and its stakeholders, to provide insights into the groups and their perceptions, and to ensure that all relevant voices are heard. We want to understand different perspectives on sustainable ship recycling and the regulatory regime taking shape around the industry. We believe this can be useful to the general public, who may not be aware of ship recycling and the environmental and social issues within it. However, we believe that the groups that may benefit from this research the most are the ship recycling stakeholders themselves. By seeing things from the perspectives of other groups, we believe it is possible to bring nuance into the debate and highlight perspectives that may not be prioritized otherwise.

1.3. Overview of the paper

This paper will begin with an industry background section to delve into the ship recycling industry and contextualize the issue. Here, we will discuss shipbreaking methods, key markets, and discuss the regulatory efforts in the industry in further detail. Section 3 will then consist of a literature review on the topics of sustainable shipping and sustainable ship recycling, which help us identify the literature gap that this research fills, and to identify the stakeholders mentioned in the literature that we base our data collection on. Once we have contextualized the issue and identified the research gap, we lay out our theoretical framework in section 4. Here, we explore stakeholder analysis theory, the power/interest matrix, and the triple-bottom line, which will be used to analyze and categorize stakeholder views. In section 5, we explain our research design, sampling method, and provides an overview of data collection methods as well as data collected. We also delve into our data analysis method and potential biases and ethical considerations in our research. Finally, sections 6 and 7 consist of data analysis and discussion, where we analyze the data collected using the theories laid out in section 4, identify trends and patterns, and discuss the implications.

2. Industry context

This section will provide background information to the shipbreaking industry to contextualize the research that will be carried out. We will briefly describe the history and development of the shipbreaking industry, as well as outline some of the most common shipbreaking methods and risks associated with the activities. Then, we will look at some of the key markets where the majority of shipbreaking takes place, discuss and explain the key pieces of regulation in the industry, and conclude the chapter by mapping out the different stakeholders involved in all the different processes. This process will also assist us in limiting the scope of the research by evaluating the relevance of the different pieces of regulation, shipbreaking markets, and stakeholders.

2.1. Industry background

The shipbreaking industry was historically located primarily in Europe (Puthucherril, 2010). However, as Europe shifted from labor intensive to capital intensive industries, industries such as shipbreaking were displaced to countries with cheaper labor and lax environmental and labor regulation (Crang, Hughes, Gregson, Norris, & Ahamed, 2013; Puthucherril, 2010). Today, the key players in the industry are primarily located on the Indian subcontinent, where they hold over 80% of the global shipbreaking market (HRC, 2018).

Although the end of a ship's useful life is generally estimated to be about 30 years, this is highly dependent on the type of vessel, and the state of the shipping industry as a whole. If the industry is thriving, for example, shipowners will delay sending their ships for scrap if they believe they can continue to utilize them before they break down, and if they are unable to meet demand in any other way. On the other hand, when the shipping industry hits a slump, shipowners may be unable to cover the costs to maintain their excess capacity, and may send older, but still useful, ships to scrap (Frey, 2015; John & Srivastava, 2018). A clear example of this was the 2008 financial crisis, where recycling

volumes increased from just over eight million in 2008 to nearly twenty-five million in 2009 (Marine Environment Protection Committee, [MEPC] 2018) as shipowners scrapped their ships before their end-of-life due to concerns about an economic recession (John & Srivastava, 2018). Scrap metal prices may also affect the shipbreaking industry, as low scrap metal prices would force shipyard owners to pay less for a ship in order to remain profitable, which would in turn make it less attractive for shipowners to recycle their ships during these dips in the market (Frey, 2015; Puthucherril, 2010).

In 2017, 23 million gross tons (GT) were sent for recycling. 17.5 million GT ended up on the beaches on the Indian subcontinent (UNCTAD, 2018). An additional 1.2 million GT went to Turkey, which is the largest player in the market outside of India, Bangladesh and Pakistan. Aside from that, there are a number of countries with a smaller recycling capacity, which we will also briefly discuss. Additionally, although China has been a big recycling state in the past, they banned waste imports as of January 2019, thereby eliminating the import of ships for scrapping (Lin, 2018a). They are still able to recycle domestic ships, but are no longer an option for European shipowners, and are therefore not considered further in this paper. Below, we delve into the key shipbreaking markets.

Alang, India: Alang beach is the largest shipbreaking yard in the world, consisting of over 160 plots. In 2017, 239 ships with a combined gross tonnage (GT) of 5,980,514 were sent to Alang (NGO Shipbreaking Platform, 2018), making it the largest scrapping location by number of vessels, and second largest by GT. The intertidal zone and large mudflats make Alang well suited to the beaching method (John & Kumar, 2016), which is used in every plot in Alang. Additionally, nearby markets for furniture and other objects recovered from the ships as well as steel mills to process the scrap steel make the location a cluster for ship recycling activity (John & Kumar, 2016).

Chittagong, Bangladesh: Chittagong beach in Bangladesh is made up of approximately 100 plots occupying 4000m^2 (Rahman et al, 2018). In 2017, 197 vessels were sent to the beaches of Chittagong with a combined GT of 6,568,227 (NGO Shipbreaking Platform, 2018). The industry is of huge economic consequence to the national economy, as over 70% of the steel demand in Bangladesh is met by the shipbreaking yards. Additionally, over 50,000 workers are directly employed at the yards without considering indirect employment in associated industries and the area surrounding the yards (Saraf et al., 2010, in S. M. Rahman et al., 2018). However, Chittagong is also the ship recycling location with the worst reputation, with high accident rates and reports of child labor (International Law and Policy Institute, [ILPI] 2016; John & Srivastava, 2018).

Gadani, Pakistan: Gadani is the smallest of the three shipbreaking hubs in the Indian subcontinent, with 130 plots operated by approximately 40 companies (John & Srivastava, 2018). In 2017, it recycled 107 ships with a total of 4,070,498 GT (NGO Shipbreaking Platform, 2018). Although it recycled fewer ships than Turkey by number (see below), the gross tonnage was much larger, as it generally recycles much larger and older vessels (ILPI, 2016; NGO Shipbreaking Platform, 2018). This increases the risk to the workers, as the vessels tend to be in worse condition than those recycled at other locations (International Law and Policy Institute, [ILPI] 2016). Gadani is also reported to be the location with the highest level of mechanization (likely due to the larger size of vessels recycled there) (World Bank, 2010).

Aliaga, Turkey: Aliaga in Turkey recycled 133 ships adding up to 1,380,955 GT in 2017. Although the low tonnage (especially compared to Gadani, which recycled fewer ships with nearly four times the tonnage) indicates that the ships recycled there are generally smaller (NGO Shipbreaking Platform, 2018), it also shows that Aliaga is increasingly popular as a recycling location. Since there

is nearly no tide, they use a slipway approach, and waste on the beach is not swept away by a returning tide as it is in other locations (Lloyd's Register, 2011). With the inclusion of two Turkish yards on the European List and Turkey's ratification of the Hong Kong Convention (currently the only recycling nation to ratify it), Turkey is becoming a highly attractive destination for shipowners who wish to comply with the regulation and the number of ships recycled there is therefore expected to increase in future years ("Ship Recycling Facilities," 2019).

Others: There are shipbreaking facilities in a number of other countries. The International Ship Recycling Association (ISRA), which represents ship recycling facilities around the world with high environmental standards ("About Us," n.d.-a), boasts member yards from Spain, Denmark, Belgium, the Netherlands, and France ("Community," n.d.). One facility in the U.S. has also been approved to join the EU-SRR list ("Ship Recycling Facilities," 2019). These facilities often recycle ships with strict occupational health and safety procedures and environmental management systems (John & Srivastava, 2018). However, the costs are much higher (John & Srivastava, 2018) and concerns have been raised about the recycling capacity of these yards (Marprof Environmental Ltd, 2019).

2.2. The shipbreaking process

Shipbreaking can be done in a few different ways, though the beaching method is the most common, as it's used in the yards in the Indian subcontinent that carry out the majority of the world's shipbreaking activities (HRC, 2018). Other locations such as Turkey and China use other shipbreaking methods. A brief overview of these is presented in the table below, including locations where the methods are used. The purpose of this table is simply to contextualize the industry and illustrate the different options available for ship recycling, and we therefore will not spend time

analyzing each option. Additionally, working conditions and other matters not directly related to the breaking method itself are not considered.

Method	Description	Location
Beaching	The ship is grounded during high tide and dismantled piece by piece during the low tide. Primary cutting takes place on the intertidal zone, where environmental pollutants are washed away by the tide.	Alang, India Chittagong, Bangladesh Gadani, Pakistan
Slipway	Slipway is similar to beaching, but used in locations with no tide, thereby reducing environmental pollution risks. In some cases, a concrete slipway is present and pieces are lifted from the ship using a crane.	Aliaga, Turkey
Alongside	The ship is secured alongside a quay or special facility, and dismantled from the top down until only the double bottom is left, which is then taken apart until it can be lifted out. Easier to contain and clean spills.	China
Drydock	Safest method, but also most expensive. The ship is dismantled in a drydock similar to those used for shipbuilding. Since the process takes place entirely outside the water, environmental risks are very low.	Europe, USA

Table 1: Developed by authors based on Lloyd's Register (2011), NGO Shipbreaking Platform ("Glossary," n.d.), John & Srivastava (2018).

As mentioned above, the beaching method is the most common, and it is the one considered by this paper. This is therefore the shipbreaking process generally referred to throughout this paper unless stated otherwise.

The overall risks of the shipbreaking process can be broken down into human and environmental risks, where human risks are comprised of health and safety issues, and environmental risks are comprised of airborne and waterborne pollution. Puthucherril (2010) explains the primary risks associated with shipbreaking, which are outlined in table 2 below.

Risk	Potential damage
Cutting	Risk of injury or death during the process of cutting the steel plates from the ship into smaller pieces, falling from high places, being hit by a falling object, etc.
Asbestos	Used extensively in ships and found to have long-term detrimental health effects after exposed. Banned from newbuildings from 2011 under the SOLAS convention (Puthucherril, 2010).
PCBs	Consumed by marine life when released into the ocean, which is then consumed by humans, potentially leading to cancer.
TBTs	Contaminates marine life and can be a health hazard to humans when contaminated fish is consumed.
Bilge water	Builds up during shipbreaking process and is then released in the ocean, threatening marine life.
Ballast water	Used to stabilize the ship and released prior to beaching, may introduce new species and endanger local ecosystems (though this is a broad problem in the shipping industry as a whole)

Table 2: Risks of the shipbreaking process. Developed by authors based on Puthucherril (2010).

In terms of human risk, the majority of incidents that take place on a shipyard happen during the cutting process, and may be due to gas explosions, falls, or having equipment fall on the workers (Government of Gujarat, 2018; S. M. Rahman et al., 2018). Some ships may have chemicals on board to keep refrigerated areas cool, which can also be highly hazardous to workers (ILO, 2004). Some of these injuries could be prevented through the use of Personal Protective Equipment (PPE), but local authorities in Alang have found PPE and safety training to be lacking (Government of Gujarat, 2018).

Injuries, illness, and even death often go unreported at these yards, so it is difficult to fully understand the level of risk that the work carries (ILPI, 2016). Additionally, it is nearly impossible to measure long-term health effects as a result of exposure to substances like asbestos due to the fact that workers are generally migrants who return to their home states after some time at the yards (ILPI, 2016; Puthucherril, 2010; Rahman et al., 2018). Furthermore, there is a cultural aspect to be

considered when it comes to risk perception. Rahman et al. (2018) observed that working conditions are generally low in industrial areas where shipbreaking yards are located in India, Bangladesh and Pakistan. He then argued that this affects workers' attitudes toward risk and perception of the danger of the working conditions, since they compared it to other, potentially riskier, jobs (S. M. Rahman et al., 2018). Of course, this is not to imply that subpar working conditions are acceptable, but simply to note that the local environment is a key factor in how stakeholders perceive the industry and its key issues, which is the basic question that this paper aims to answer.

Similarly, when discussing environmental risk, Rahman et al. (2018) found that shipbreaking areas are highly-concentrated industrial areas where the shipbreaking industry is not the only polluter. When speaking to locals, he found that some believed the chemical plants and garment factories working with dyes and other pollutants to be the main source of the marine pollution in the area, rather than the shipbreaking activities (S. M. Rahman et al., 2018). This highlights two things: firstly, without considering local circumstances and concerns, our understanding of the shipbreaking industry and its problems is not complete. Secondly, the lack of causality between environmental pollution and individual industries and activities adds a layer of complexity to the issue.

2.3. Regulation

The shipping industry is notoriously difficult to regulate. As a global industry, it prefers international regulation that can be applied globally, and considers unilateral regulation to be burdensome as it leads to a competitive disadvantage for shipowners covered by the regulation. This encourages practices common to the industry such as flagging out, where owners may register their vessels in another country (and fly their flag) due to lower fees, more favorable requirements, or more lax regulatory enforcement (Stopford, 2009; van Leeuwen, 2015).

This is a huge problem for the shipping industry overall, since flag states are tasked with regulatory enforcement, which is impossible when the top three flag states, Panama, Marshall Islands, and Liberia, have over 40% of the global merchant fleet by dwt registered under their flags (UNCTAD, 2018). These flags are often referred to as flags of convenience (FOCs), and they tend to specialize in a specific shipping segment or activity. For example, 24% of global dry bulk carrier fleet flies the Panamanian flag, and 16% of the global container ship fleet is registered in Liberia (UNCTAD, 2018). In the same manner, some flags are especially popular for end-of-life journeys, as they may offer packages specifically for these voyages that make them more attractive than traditional FOCs. NGO Shipbreaking Platform points to St. Kitts and Nevis, Comoros, and Palau as key end-of-life flags ("Flags of Convenience," n.d.).

However, multilateral regulation as developed by the International Maritime Organization (IMO) is extremely time consuming and filled with complexities and delays. Additionally, it requires a certain level of consensus to enter into force, which means compromises are necessary in order to ensure that a convention is ratified (van Leeuwen, 2015). The Hong Kong Convention, for example, requires 15 countries making up 40% of the global maritime fleet by gross tonnage to be ratified (Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, [HKC] 2009, p. 9). This has generally led to frustration by a number of actors including the European Union, which has begun to act to fill the gap and implement more stringent legislation (van Leeuwen, 2015). This is the case for many issues, and it can also be seen in the shipbreaking sphere, where the EU has stepped in with the EU Ship Recycling Regulation in response to the delay of entry into force of the Hong Kong Convention. Both of these pieces of regulation are discussed in detail below.

In the ship recycling sphere, regulation has generally attempted to tackle the low standards found in the yards in India, Pakistan, and Bangladesh, which use the beaching method of shipbreaking. They have attempted to do this through preventing the export of hazardous wastes (the

Basel Convention), through setting a minimum standard for global shipbreaking activities (the Hong Kong Convention), or through ensuring a fast entry into force and increased standards for shipbreaking yards (the EU Ship Recycling Regulation). These three pieces of regulation govern the shipbreaking industry to different degrees and with different levels of success, and all three will be discussed in the coming sub-sections.

Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 by the United Nations Environmental Program (UNEP), and came into effect in 1992 ("Overview," n.d.). It was a response to increasing environmental awareness and greater environmental regulation in developed countries, which led companies to export hazardous wastes to developing economies, where environmental regulations were less developed, in order to cut costs ("History," n.d.). It was drafted to combat the "toxic trade" and to protect human health and the environment against hazardous wastes ("History," n.d.).

In 1995, the Basel Convention "Ban Amendment" proposed a total ban on transboundary movements of hazardous wastes from OECD to non-OECD countries ("Ban Amendment," n.d.). When considered in the context of ship recycling it would prohibit the export of a ship for recycling from an OECD country to a non-OECD country (such as India, Bangladesh, and Pakistan). The Amendment was proposed to remedy what many saw a key loophole: waste transport could be claimed to be for recycling to circumvent the regulation (Alam & Faruque, 2014). However, it has not been ratified by sufficient parties to come into effect. Furthermore, even if it were to come into force, the issue of regulatory avoidance due to reflagging would remain (HRC, 2009).

Although the Basel Convention text does not directly refer to the shipbreaking industry at any point, the Secretariat of the Basel Convention released a document titled "Technical Guidelines for

the Environmentally Sound Management of the Full and Partial Dismantling of Ships" (2003), acknowledging the lack of regulation in shipbreaking activities and the possible applicability of the Basel Convention to the industry. The guidelines state that a number of materials used in shipbuilding, including asbestos and PCBs (discussed in section 2.2.) among others, would be classified as hazardous wastes under the Basel Convention, and that since the release of these materials during the shipbreaking process would be inevitable, "the need for an Environmentally Sound Management of the ship-recycling industry is therefore apparent" (Secretariat of the Basel Convention, 2003, p. 22).

There has been extensive debate about whether the Basel Convention is well-suited to regulating the industry. Lloyd's Register (2011) argues that although the Basel Convention has determined that a ship may be a waste, what happens once this has been determined is unclear, as "shipowners do not go marching to the local port authority and declare that the ship is about to go on its final voyage" (p.17). This illustrates a key issue with shipbreaking regulation in general: only the shipowner can declare intent to scrap a ship, and if they choose not to do so until they are in international waters, there is little that regulators can do to interfere. While some agree that the applicability of the Basel Convention is limited (Chang, Wang, & Durak, 2010; Devault et al., 2017; Frey, 2015), others argue that it is the only ratified, international regulatory instrument and that it is instrumental in regulating shipbreaking activities (Alam & Faruque, 2014; Bhattacharjee, 2009; HRC, 2018). Additionally, the Basel Convention has been referred to by national courts in Turkey, India, and the Netherlands in ship recycling cases, and the Indian Supreme Court used the Basel Convention to develop its 2003 ship recycling directives (Bhattacharjee, 2009).

Since the Basel Convention entered into force in 1992, other instruments have been developed specifically for the ship recycling industry: primarily the 2009 Hong Kong Convention and the 2013 EU Ship Recycling Regulation, which are discussed below. Though it is important to acknowledge that the Basel Convention remains the only international regulatory instrument in force governing the

ship recycling industry, its implementation has faced a number of key challenges, and it has not been fully accepted by the shipping industry, which is key to ensuring its success when applied.

Hong Kong Convention

The Hong Kong Convention for Safe and Environmentally Sound Recycling of Ships (HKC) was adopted by the International Maritime Organization in 2009. Its aim is to ensure that ships being recycled "do not pose any unnecessary risks to human health, safety, and to the environment" ("Ship Recycling," n.d.), and to address they key issues in ship recycling, including hazardous materials as well as labor and environmental conditions at the ship recycling yards ("Ship Recycling," n.d.). It is a key piece of regulation for the industry, as it is the only internationally applicable instrument developed for the ship recycling industry (taking into consideration that the applicability of the Basel Convention has been contested as discussed previously, and that the EU-SRR is only applicable at a regional level). As such, it has been at the center of conversations on ship recycling for over a decade.

The Convention establishes the requirement of an Inventory of Hazardous Materials (IHM), which should list the location and concentration of hazardous materials as listed in the Convention, and which should be updated by every owner throughout the ship's operational life, concluding with a final survey prior to the ship being scrapped (HKC, 2009). Shipyards must also have a Ship Recycling Facility Plan including information on emergency preparedness plans, worker safety and training, reporting systems for incidents and occupational health and safety matters, among others (HKC, 2009). Additionally, a Ship Recycling Plan must be developed for each ship to be recycled at the facility, specifying the manner in which the ship will be recycled based on its IHM and individual characteristics (HKC, 2009).

The HKC must be ratified by at least 15 countries making up a minimum of 40% of the world merchant fleet by gross tonnage (GT) and 3% of the global annual ship recycling volume to come

into effect (HKC, 2009). As of April 2019, only ten nations have ratified it, meaning it has yet to come into effect. Although it has been ratified by big shipping nations such as Denmark and Japan, flag states such as Panama, and recycling states such as Turkey (International Maritime Organization, [IMO] 2019), the latest IMO calculations show that they only make up 23.16% of the world merchant fleet (IMO, 2019). However, the pace has picked up in 2019, with four states ratifying early this year and large players like India and China reported to be in the process of ratification (Adamopoulos, 2019). Once ratified, the Convention will take 24 months to come into effect (HKC, 2009).

Due to its importance to the industry, the HKC has become somewhat of an industry standard, and stakeholders have begun preparing for its eventual ratification. Large shipping companies such as Maersk have begun implementing the Convention internally (A.P. Møller Maersk, [Maersk] 2018). Additionally, classification societies have begun to offer services relating to HKC compliance, such as Statements of Compliance (SOCs) for ship recycling yards, and IHM assistance for shipowners. The Statements of Compliance, which certify that a facility is able to recycle ships in line with HKC requirements, are fully voluntary and not associated with any regulatory body, and their legitimacy has been questions by a number of stakeholders including NGOs and the United Nations Human Rights Council ("HKC Statements of Compliance," n.d.; Human Rights Council, 2018).

Additionally, the Hong Kong Convention itself has been criticized by stakeholders on a number of issues. NGOs have criticized it for failing to ban the beaching method, lacking guidelines on downstream waste management, and for putting responsibility for enforcement on flag states, which encourages shipowners to flag out their ships to circumvent the regulation ("Hong Kong Convention," n.d.). Matz-Lück refers to the Convention's regulatory approach as "heavily based upon bureaucratic procedure instead of substantive prohibitions, incentives for better practice, or specific targets" (2010, p. 102). It is generally agreed that the Hong Kong Convention falls short in some areas, a matter which is discussed in detail in the analysis section of this thesis. Other areas mentioned

include the lack of financial assistance for developing nations to upgrade their yards (Matz-Lück, 2010), and its reliance on flag and recycling states, "weak links" (Argüello Moncayo, 2016, p. 304), for enforcement when recycling states lack resources and already struggle to improve standards, and when re-flagging is such common practice before a vessel's final voyage (Argüello Moncayo, 2016). However, as Matz-Lück hints above, it seems that these were the measures that everyone could agree on in the bureaucratic process of developing a convention for the IMO.

EU Ship Recycling Regulation

The EU Ship Recycling Regulation (EU-SRR) was adopted in November 2013, and came into effect on 31 December 2018. It was developed with the aim of reducing the negative impacts of ship recycling (EU Ship Recycling Regulation, [EU-SRR] 2013). It generally follows the guidelines set out by the Hong Kong Convention with the goal of faster implementation while the ratification process continues to take place at the IMO (Directorate-General for Environment, [DG Environment] 2019). It sets requirements for the shipowner with the Inventory of Hazardous Materials, which is required for all EU-flagged ships being recycled from 2016, for all new EU-flagged ships from 2019, and for all EU-flagged ships and all ships calling at an EU port from 2021 (DG Environment, 2019). Furthermore, non-EU vessels calling at an EU port should have a statement of compliance from the relevant authorities of the flag state for that vessel, verifying the IHM (International Chamber of Shipping, [ICS] 2016). The requirements for the contents and hazardous materials to be included in the IHM are virtually the same in the Hong Kong Convention and EU Ship Recycling Regulation, though the EU adds one more substance (PFOS) (ICS, 2016).

However, the key component of the EU-SRR is the European List: a list of ship recycling facilities that fulfil the requirements set out by the EU-SRR and that have been approved for recycling of EU-flagged vessels (DG Environment, 2019). Recycling of vessels covered by the regulation can

thus only take place at facilities on the European List (DG Environment, 2019). The list is periodically updated to include new yards and remove non-compliant yards. Yards within the EU are nominated for inclusion on the list by their state, which is responsible for ensuring compliance, while yards outside of the EU must submit an application and go through an auditing and review process (DG Environment, 2019). Currently, only three non-EU yards are on the list: two facilities in Turkey and one in the US (DG Environment, 2019), and the process has been called unfair by some stakeholders as it is advantageous to EU yards that can be approved without an EU audit (Jorgensen, 2019).

A number of yards in Alang are currently in the auditing and review process to join the list, though the two yards audited by DNV-GL (the external auditors hired by the European Commission) have both failed the on-site inspections and are now in the process of making improvements based on the auditors' recommendations and submitting to a second inspection (Krigslund, 2019a). Argüello Moncayo also points out that the regulation effectively bans beaching by requiring that recycling facilities on the list "operate from built structures" (2016, p. 307), effectively banning the dismantling of a ship on an intertidal mudflat. Lloyd's Register, in response to preliminary statements from the EU regarding banning beaching, states that "prohibiting beaching outlaws up to 95% of present recycling and business capacity, with no known practical replacement" (2011, p. 19).

The list has been a key point of contention between the EU and other industry stakeholders. Some argue that the list lacks sufficient capacity in its current form to meet demand (Danish Shipping, 2018; Jorgensen, 2019; Marprof Environmental Ltd, 2019), though the EU refutes this claim and argues that the list has three times the required capacity for recycling (DG Environment, 2019). Similarly, though some believe that the list can be a great incentive for yards (particularly in South Asia) to upgrade their facilities in order to gain access to the European market (Danish Shipping, 2018; Jorgensen, 2019; Nightingale, 2018), they also argue that if the top yards in Alang (e.g. Shree Ram, which is one of the audited yards) are unable to gain access, this would discourage other players

from investing (Nightingale, 2018). It is worth noting that the EU, like the Hong Kong Convention, also fails to provide financial assistance for developing nations to upgrade their facilities and thus be able to gain inclusion on the list. Finally, it is key to consider the potential consequences of shutting out South Asian yards, which are highly dependent on the shipbreaking industry for employment and raw materials, from the list entirely (John & Srivastava, 2018; S. M. Rahman et al., 2018).

Although the SRR applies the requirement of an IHM to all ships calling at EU ports, the European List requirement is limited to EU-flagged vessels, which increases the risk of flagging out (Ormond, 2012). As discussed in the previous section, flagging out to an end-of-life flag before a vessel's final voyage is already common practice in the industry (Argüello Moncayo, 2016; "Flags of Convenience," n.d.), and some Greek shipowners have openly stated that they would consider flagging out to circumvent the EU regulation (Bockmann, 2019).

Others

The Basel Convention, EU Ship Recycling Regulation, and the Hong Kong Convention (once entered into force) are all legally binding for shipowners within the relevant jurisdictions. Some countries have also established their own local or national ship recycling guidelines, such as India. The Central Pollution Control Board (CPCB) has issued environmental guidelines for the industry, and the Gujarat Maritime Board (GMB), which rules over the shipyards in Alang, issued the Gujarat Maritime Board Ship Recycling Regulations in 2003 (Puthucherril, 2010). These guidelines, in turn, refer to relevant IMO and ILO conventions ratified by India, as well as a number of national acts legislating on labor and environmental matters that can be applied to the shipbreaking industry (Puthucherril, 2010). However, it does not acknowledge the relevance of the Basel Convention, which was the only legal instrument regulating the industry in 2003. Additionally, Puthucherril (2010) criticizes the language of the regulation, as it is very general and open to interpretation, and provides

a lot of power and discretion to the ship recycler to appoint its own safety officer, who would then be responsible for inspecting the yard in case of an accident (Puthucherril, 2010).

The Indian Supreme Court has also been involved in a number of cases regarding ship recycling, and have played a key role on the national stage. They have attempted to balance the economic benefits the industry brings with the negative externalities of hazardous waste imports and sub-standard conditions (Demaria, 2010; Puthucherril, 2010). Puthucherril (2010) criticizes the Supreme Court guidelines on the matter in the same way as other national regulation in India: the language is far too general and open to interpretation. Additionally, they fail to address worker safety and conditions at the most basic level, and do not consider basic aspects such as wages, living conditions, or training (Puthucherril, 2010). Demaria also criticizes the Supreme Court's decision to allow dismantling of the Blue Lady at Alang in 2007, arguing that the decision was based on the idea that "economic benefits can compensate for environmental degradation" (2010, p. 259). However, the country's ship recycling industry has not been receptive to these guidelines, as they view them as too stringent (Puthucherril, 2010). Overall, Puthucherril argues that national regulation has been inefficient in India and that global regulation is necessary for a global industry (2010).

The situation is worse in Bangladesh, where Puthucherril (2010) states that there is no legal framework. Alam and Faruque (2014) outline the release of guidelines by the Ministry of Industries in 2011 similar to those stipulated by international regulation, such as requiring facilities to submit a Ship Recycling Plan and Ship Recycling Facility Plan (Alam & Faruque, 2014). The Ship Breaking and Recycling Rules also allow for the creation of a new body that would be in charge of issuing all certificates necessary for a yard to operate, including permissions for beaching and cutting (Alam & Faruque, 2014). However, the rules have not been enacted and are therefore only voluntary guidelines until they are passed as law (Alam & Faruque, 2014).

There is limited information on national regulation in Pakistan and Turkey. The only reference we were able to find to national regulation in Pakistan was to a No Objection Certificate that must be issued by local authorities before a ship is allowed to be beached, which requires an "impact assessment" to be submitted (World Bank, 2010, p. 42). In Turkey, shipbreaking regulation from 2004 proposes guidelines for occupational health and safety and controlling pollution from shipbreaking activities, and requires that an inventory of hazardous and non-hazardous wastes is made before a ship can be scrapped (Neşer, Ünsalan, Tekoğul, & Stuer-Lauridsen, 2008).

There are also a number of non-legally binding guidelines developed by different organizations, such as the ILO *Safety and health in shipbreaking: Guidelines for Asian countries and Turkey* (ILO, 2004), and the International Chamber of Shipping guidelines for shipowners selling their ships for scrapping (2001, 2009, 2016). The ILO guidelines, though not legally binding, are the only official guidelines that focus entirely on workers' conditions and safety, and are referred to in both the Hong Kong Convention and the EU Ship Recycling Regulation. They call for official national policies on ship recycling that help transition the industry away from the informal economy to the formal economy, by (among others) acknowledging shipbreaking as a legitimate industry (ILO, 2004). They further outline the need for Occupational Health and Safety (OHS) management systems, for identification of hazardous substances on board ships (in a similar manner to the Inventory of Hazardous Materials required by current legal instruments), as well as better reporting of workplace accidents and illness, among others (ILO, 2004).

Finally, the International Chamber of Shipping, the largest shipowners' association in the world, has released a number of guidelines on ship recycling. In 2001, they released a best practice document for the industry outlining the need for a hazardous material inventory to be prepared and provided to the ship recycler, as well as the need to ensure that the ship is delivered to the yard in safe-for-entry and safe-for-hot-work conditions (International Chamber of Shipping, [ICS] 2001). It

also addressed issues such as circularity, suggesting that naval architects should consider e.g. using fewer composite materials that are difficult to recycle and limiting use of potentially hazardous materials (ICS, 2001). At the same time, the guidelines state that "there are major areas over which the majority of shipping companies have little or no directly influence, including, vitally, the standards applicable in the recycling yards" (ICS, 2001, p. 2), thereby releasing the industry from responsibility for these issues. After the passing of the Hong Kong Convention in 2009, the ICS released a new set of guidelines, this time focused on compliance with the regulation (ICS, 2009). A second edition was released in 2016 including guidance on the EU-SRR and expanding considerably upon the guidelines for developing an IHM as well as its previous guidelines on ensuring a recycling facility is "competent" (ICS, 2016, p. 12) when selling a ship for recycling.

2.4. Summary

In this section, we have provided an overview of the ship recycling industry, outlining current trends, key markets, methods, and risks. We also discuss the regulatory framework governing the industry, which helps us understand the purpose of different pieces of regulation, as well as their current status and key criticisms. Based on this information, we can limit the scope of our investigation in several ways: firstly, by focusing on beaching yards in the Indian subcontinent, as these are the ones that carry out the vast majority of ship recycling activities worldwide, and where poor environmental and social conditions are found. Secondly, by focusing on two pieces of regulation: the Hong Kong Convention and the EU Ship Recycling Regulation. Though the Basel Convention is discussed in the analysis and discussion sections of this paper, it has been in effect since 1992 and its success in regulating ship recycling has been limited. We therefore prefer to focus on the HKC and EU-SRR, which are at the center of industry debate today.

3. Literature review

Now that we have provided the necessary context for the study, we can move on to the literature review, which will examine previous academic literature on industry-relevant topics such as sustainable shipping, ship recycling, environmental analyses and working conditions, and circularity in ship design. We will review the literature and identify key themes and discourses. This is helpful in contextualizing the field within which our research is located, as well as helping us identify the literature gap that we can fill through our analysis. The section concludes with a table outlining relevant stakeholder groups in the industry and briefly explaining the role they play.

3.1. Sustainable shipping

This section aims to provide an overview of literature on sustainable shipping in general, in order to gain an understanding of the key issues and areas considered important within the industry, and to identify key concepts and terminology within the area of sustainability in shipping.

Literature on sustainable shipping has focused on what tend to be seen as the industry's key issues, namely CO_2 emissions, SOX and NOX emissions, and ballast water management (Andersson, Brynolf, Lindgren, & Wilewska-Bien, 2016; Parviainen, Lehikoinen, Kuikka, & Haapasaari, 2018; Poulsen, Ponte, & Lister, 2016). Ship recycling has not generally been given the same level of consideration in the mainstream sustainable shipping literature and has instead been discussed as a separate issue (Chang et al., 2010; Devault et al., 2017; Kanu Priya Jain, Pruyn, & Hopman, 2018). Furthermore, it is worth noting that sustainable shipping literature focuses heavily on environmental sustainability. Social issues such as seafarer health and safety are considered from a regulatory and governance perspective (Bauer, 2007; Bloor & Sampson, 2009; Bloor, Thomas, & Lane, 2000). Sampson considers seafarer welfare in the context of CSR initiatives, but this is the exception rather than the rule (2016). In the field of ship recycling, social matters are placed at the forefront and

discussed much more extensively (S. M. Rahman et al., 2018; Rousmaniere & Raj, 2007; Sahu, 2014; Schøyen, Burki, & Kurian, 2017).

However, sustainable shipping should consider the triple bottom line: economic, social, and environmental sustainability (Cheng et al., 2015 in Yuen, Wang, Wong, & Zhou, 2017). According to Yuen et al., sustainable shipping should meet present needs without compromising future ones (2017). Parviainen et al. provide a definition of socially responsible shipping company:

> [...] a company that actively incorporates social and environmental concerns in its business operations and that, in addition to the financial stakeholders, such as ship owners, shareholders, ports, customers, financers, insurers, and classification societies, also pays attention to the interests of the non-financial stakeholders, such as different environmental and societal stakeholder demands (2018, p. 52).

Environmental issues in the industry are often discussed as a result of regulation (Parviainen et al., 2018; van Leeuwen, 2015; Wan, el Makhloufi, Chen, & Tang, 2018), rather than as a proactive attempt to move beyond compliance. However, regulatory shortcomings in the shipping industry are also discussed at length (Froholdt, 2018; Lister, 2015; Poulsen et al., 2016; Wan et al., 2018; Wuisan, van Leeuwen, & van Koppen, 2012), showing that the industry's regulatory framework is heavily fragmented. Celik and Topku (2014) and Galley (2013) discuss the issue of flagging out as a form of regulatory avoidance. Lister (2015) and Froholdt (2018) specifically point to insufficient regulation as the reason CSR initiatives have arisen. Multi-stakeholder initiatives such as the Sustainable Shipping Initiative (SSI) and the Clean Shipping Project (CSP), that arise to fill the gap in regulation, have been discussed (Poulsen et al., 2016; Wuisan et al., 2012). The role of cargo owners and other stakeholders in putting pressure on shipowners to adopt sustainable shipping practices has also been discussed (Parviainen et al., 2018; Poulsen et al., 2016; Yuen et al., 2017). Sustainable shipping is also framed as owner-driven (Parviainen et al., 2018; Wuisan et al., 2012; Yuen et al., 2017), emphasizing the responsibility of the shipowners and the shipping industry to behave sustainably,

and promoting multi-stakeholder initiatives such as the SSI and CSP (mentioned above) as a way for shipowners to engage in CSR and stakeholder engagement (Parviainen et al., 2018).

Several articles discuss the motivation of shipping companies to engage in sustainability and CSR activities (Parviainen et al., 2018; Poulsen et al., 2016), and consider both the potential competitive advantage of having a 'green' brand image, and the reputational risk of not being seen as 'green'. Poulsen et al. (2016) further identifies differences between shipping segments in relation to CSR engagement, arguing that segments such as tankers would not stand to gain from having a 'green' brand image and would therefore not engage in CSR activities. Overall, a pattern emerges that sustainability efforts in the industry depend on external pressure from other stakeholders (Parviainen et al., 2018; Poulsen et al., 2016; Wuisan et al., 2012; Yuen et al., 2017).

3.2. Sustainable ship recycling

Ship recycling is generally recognized as one of the most dangerous industries in the world (Demaria, 2010; Puthucherril, 2010), with negative environmental and social impacts. Literature on ship recycling discusses environmental issues (Choi, Kelley, Murphy, & Thangamani, 2016; Du, Zhang, Zhou, Yuen, & Wong, 2018; John & Srivastava, 2018; Pasha, Hasnat, & Rahman, 2012) and social issues (Hossain et al., 2008; Sahu, 2014). It is generally agreed that if carried out in a safe and environmentally sound way, shipbreaking is by far the most sustainable way to dispose of an obsolete vessel, since the majority of the vessel would be recycled or reused (Devault et al., 2017; Rossi, 2010; Sujauddin et al., 2014). The benefits of shipbreaking are manifold, providing employment, reducing the need for steel production, and helping local communities flourish through associated industries (Demaria, 2010; Mishra, 2018; S. M. Rahman & Mayer, 2016).

A key field within the literature is location-based environmental analysis, which has been carried out for key shipbreaking locations: Alang (Demaria, 2010; Frey, 2015), Chittagong (Kutub et

al., 2017; Pasha et al., 2012; Sujauddin et al., 2014; Tokoro et al., 2016), and Aliaga (Neşer et al., 2008). These papers take material flows perspectives and environmental impact assessments. Some literature provides suggestions for environmental improvements through different methodologies such as cleaner production (Jain et al., 2018), material flow analysis (Jain, Pruyn, & Hopman, 2017) and environmental impact assessment through life cycle analysis (John & Srivastava, 2018). In terms of location analyses, there is little in terms of analysis of social conditions in the literature. Hossain et al. (2008) look at occupational health issues in Chittagong beach, while Kutub et al. (2017) consider both social and environmental aspects in their analysis of Chittagong. Sahu (2014) analyzes working conditions in Alang, and Rahman et al. (2018) examines local perspectives of the industry in Chittagong. Finally, there has also been some analysis of the steel industry in relation to ship recycling, from a material flows perspective (Rahman, Handler, & Mayer, 2016) and from a social perspective, evaluating the effect of social relationships on material flows (Rahman & Mayer, 2015).

The general discourse adopted by the literature is that although ship recycling is, in theory, a sustainable activity, there is an overwhelming number of downsides in the form of environmental pollution, occupational health and safety risks, and social issues relating to conditions of employment, among others. Rahman et al. (2018) and Cairns (2007) discuss alternative discourses of ship recycling. Rahman et al. (2018) argues that the dominant discourse is based on Western stakeholders and ideals that do not represent the workers and yard owners and the decisions they make. They further point to the fact that the dominant discourse affects policy making, implying that regulatory efforts fail to represent groups with different views. They acknowledge the negative externalities present in the ship recycling industry, but consider that the risk perception of the yard workers is entirely different from that of Western stakeholders, and that they view it as an acceptable risk compared to other employment options (Rahman et al., 2018). They further pose that local stakeholders such as the local community, yard owners, and workers view the ship recycling industry

primarily in a positive light. They view their working conditions as favorable, and generally consider environmental pollution in the area to be the result of other industries working with dyes and other hazardous chemicals (Rahman et al., 2018), proposing an entirely different interpretation of the industry. Cairns (2007) argue that the ship recycling industry is complex and cannot be understood based on "developed world notions of ethics, environmentalism, and good and bad" (p.266), and that we must take an impartial perspective to "engage with the truly problematic nature of this industry, but without imposing western notions of "good"" (Cairns, 2007, p.277).

Like in sustainable shipping, a significant issue discussed in ship recycling literature is that of industry regulation. The Hong Kong Convention is discussed at length (Bhattacharjee, 2009; Matz-Lück, 2010; Mishra, 2018), as is the EU Ship Recycling Regulation (Argüello Moncayo, 2016; Alcaide et al., 2017). Local implementation of global regulation is discussed by Alam and Faruque (2014) and Rahman and Mayer (2016) in Bangladesh, Puthucherril (2010) in India, and Mishra (2018) in India, Bangladesh, and Pakistan, and by Zhang (2016) in China. The regulation is also heavily criticized, with Argüello Moncayo (2016) arguing that both the Hong Kong Convention and the EU Ship Recycling Regulation "represent a step back in the regulation of ship recycling" (p.301) and Bhattacharjee (2009) refers to the Hong Kong Convention as "two steps back" from the Basel Convention (p.193). Matz-Lück (2010) states that although the HKC is a step forward, it provides only the minimum acceptable standards for the industry. Alcaidea et al. (2016) further discuss the risk that regulation such as the HKC and EU-SRR may increase the risk of shipowners flagging out to so-called end-of-life (EOL) flags such as Comoros and Tuvalu (Alcaidea, Piniella, & Rodríguez-Díaza, 2016), making regulatory implementation impossible.

Additionally, the concept of sustainability in the shipbreaking industry is contested by different stakeholders, and there is no consensus on its meaning. Demaria (2010) found that different social groups understood sustainability differently, with some groups emphasizing economic benefits

(and arguing that they outweighed social and economic losses), while other groups saw only the social and economic losses, without acknowledging the economic benefits of shipbreaking (Demaria, 2010).

Ship recycling literature covered so far discusses regulators, workers, shipyard owners and local communities as stakeholders. However, shipowners themselves and their responsibilities in this field are not sufficiently discussed. Devault et al. (2017) argue that shipowners should be responsible for ensuring that the intermediary buyers sell their ships to facilities that have "the experience and credentials necessary" (p.25744) to recycle the ship efficiently and safely, while Cairns (2007) argues that shipowners and governments from shipowning (rather than ship scrapping) nations should invest to upgrade the industry. Alcaidea et al. (2016) discuss ship owner responsibility in terms of the risk of flagging out, and Alcaide et al. (2017) argue that shipowners have, at the very minimum, a responsibility to comply with regulation. Schøyen, Burkin and Kurian (2017) points out that due to the lack of effective regulation and the risk of flagging out, the legal responsibility for ship recycling falls not on the shipowner, but on the recycling state.

Schøyen et al. (2017) focus on Norwegian shipowners and their views on both environmental and social conditions in the ship recycling industry, and find that it is best practice to avoid using the beaching method at all due to fear of public outcry and because they "want to convey an environmentally friendly image to customers" (Schøyen et al., 2017, p. 503). This ties into what was discussed in the sustainable shipping section above, where Poulsen et al. (2016) and Parviainen et al. (2018) both discuss the benefits of shipowners developing a CSR profile. They argue that it is the shipowners' responsibility to choose the method and location for recycling. They also discuss pressure on shipowners by external stakeholders through the Responsible Ship Recycling Standards (RSRS) adopted by some European shipping financiers (Schøyen et al., 2017).

We can see that despite the extensive body of literature discussing the ship recycling industry and the issues within it, apart from Schøyen et al. (2017) there has been very little focus on

stakeholders and stakeholder perspectives within the ship recycling industry. In particular, there is a lack of focus on shipowners and their responsibility to the industry. We believe that there is a need for a broader stakeholder analysis of the industry, in order to gain an understanding of the different perspectives of the shipbreaking industry by stakeholders with diverse roles and worldviews.

3.2.1. Design for ship recycling

The issue of designing ships for easier dismantling has been a matter of discussion for years. It is mentioned in the 2003 ship recycling technical guidelines from the Basel Convention (2003), which state that the most efficient way to control environmental hazards is to prevent them through "clean ship design practices" (p.23) which address issues such as minimizing waste and optimizing recycling (Secretariat of the Basel Convention, 2003). However, academic literature has only briefly dealt with the issue. Andersson et al. state that "the dismantling process is not currently considered in the ship design process, where the main focus is safety and reliability" (2016, p.246). Additionally, Jain et al. (2018) provide an overview of literature focusing on designing ships for recycling, and finds very few articles (Alkaner et al., 2006; McKenna et al., 2012; Sivaprasad & Nandakumar, 2013 in Jain et al., 2018). Of these, we were only able to access Sivaprasad and Nandakumar (2013). Jain et al. (2015, 2016, 2018) have all also dealt with the issue of design for recycling.

Sivaprasad and Nandakumar (2013) have likely made the greatest contribution to the literature in this field with their formulation of the design for ship recycling philosophy of engineering, defined by Sivaprasad (2010 in Sivaprasad & Nandakumar, 2013) as:

> […] a set of design and development activities spread over the entire lifecycle stages of a ship, incorporating ideas for design/selection of structural parts, equipment, material and knowledge base that will facilitate clean and safe partial or end of life recycling of ships (p.215).

On the point made by the Basel Convention (2003) that preventing hazardous waste should be the primary goal, Jain et al. (2018) agree, and argue that environmental management "must be seen from a product and process design point of view" (p.251). Aside from the limited literature focusing on design for recycling, Devault et al. (2017) touches upon it, and finds that some issues associated with ship recycling could be avoided by considering recycling during the design phase. They also suggest that public fleets from developed nations should "set a good example" (p.25767), by using designs that are adequate for recycling (Devault et al., 2017). Finally, John and Srivastava (2018) note that ship designers should think along the lines of the design-for-recycling methodology philosophy put forth by Sivaprasad and Nandakumar (2013).

We can thus see that recent literature is beginning to mention the issue of design in conjunction with other ship recycling matters, and we hope this means that the issue is gaining more traction in the literature. Additionally, the issue is expressly mentioned in the Hong Kong Convention (2009, p.3), though only briefly, and there are no industry guidelines or regulations regarding circular ship design (or design for ship recycling). We will further explore industry practitioners' perspectives on circular ship design in the analysis section of this thesis.

3.3. Industry stakeholders

Based on the information presented in the section 2, and the literature review in this section, we can identify a number of key stakeholder groups present in the industry. In this section, we present the primary stakeholders identified by literature related to ship recycling, along with their roles as well as the sources (both academic and industry) that refer to them as industry players. We do not speculate as to motives or level of influence, as this is discussed at length in the analysis conducted in section 6.

Stakeholder group	Role	Sources
Cash buyers	Cash buyers act as intermediaries, purchasing the ship from the owner and selling it to a yard for recycling at end-of-life.	Devault et al., 2017; Lloyd's Register, 2011; ICS, 2016.
Class societies	Classification societies are key players in the shipping industry, as they establish technical standards for ships. In ship recycling, they provide IHM services and issue HKC Statements of Compliance to ship recycling yards.	Lloyd's Register, 2011; HRC, 2018; Danish Shipping, 2018.
Consultancies	Green recycling consultancies are not mentioned in the literature, but they have taken on the role of helping shipowners prepare IHMs and recycle their ships in compliance with regulation.	"Grieg Green," n.d.; "Services," n.d.
The EU	The EU is responsible for the EU-SRR, as discussed in detail in section 2.3.	Lloyd's Register, 2011; HRC, 2018; ICS, 2016.
Financiers	Financiers (e.g. banks or pension funds) loan or invest money in newbuildings. Some financiers have joined the Responsible Ship Recycling Standards, requiring ships to carry an IHM to be financed and to recycle vessels in accordance to regulation.	Lloyd's Register, 2011; Devault et al., 2017; NGO Shipbreaking Platform, 2018; Nordea, 2017.
Flag states	Flag states are responsible for enforcement of most maritime regulation. Under the EU-SRR, they must verify ships' IHMs. Under HKC, they must survey ships to the Convention standards.	Devault et al., 2017; Lloyd's Register, 2011; DG Environment, 2019; Chang et al., 2010.
Human Rights Council	The UN Human Rights Council has generated three reports from Special Rapporteurs over the past decade, detailing the adverse effects on human rights of ship recycling activities.	HRC, 2009; 2010; 2018.
ILO	The International Labor Organization is a UN agency. The ILO guidelines on ship recycling are discussed in section 2.3.	HRC, 2009; Lloyd's Register, 2011; Rahman et al., 2018.
IMO	The International Maritime Organization is a UN agency. The IMO's Hong Kong Convention is discussed in section	Lloyd's Register, 2011; Bhattacharjee, 2009; ICS,

	2.3.	2016.
Local communities	Local communities are affected by the environmental pollution created by the yards, which affects air quality and local food sources (e.g. fish).	HRC, 2010; Sahu, 2014; Rahman et al., 2018.
Multi-stakeholder initiatives (MSIs)	MSIs like the Ship Recycling Transparency Initiative (SRTI) bring together shipowners, cargo owners, and financiers interested in how ship recycling affects their activities.	NGO Shipbreaking Platform, 2018; SRTI, 2019
NGOs/Civil society	NGOs such as the Shipbreaking Platform have been instrumental in bringing attention to the issue of substandard ship recycling, pushing for regulation, and pressuring stakeholders to improve conditions.	HRC, 2010; 2018; Lloyd's Register, 2011; Rahman et al., 2018; Bhattacharjee, 2009.
Port States	Port State inspections should include a verification of the IHM and Ready for Recycling Certificate under the HKC.	HRC, 2009; Devault et al., 2017; MEPC, 2012.
Recycling States	Local regulators are responsible for enforcing international regulation, and may have their own local regulation that applies to shipbreaking.	HRC, 2009; 2010; 2018; Sahu, 2014; Rahman et al., 2018; Bhattacharjee, 2009.
Secretariat of the Basel Convention	The Secretariat of the Basel Convention is administered by UNEP. The Basel Convention is discussed in section 2.3.	HRC, 2009, 2018; Lloyd's Register, 2011.
Shipbreakers	Shipbreakers are defined as the ship recycling yards and their management (workers are treated as a separate stakeholder category below).	HRC, 2009; 2010; Devault et al., 2017; Rahman et al., 2018.
Shipowners	Shipowners supply the ship for recycling. Alongside the shipbreakers, they make up the core of the industry.	Devault et al., 2017; Sahu, 2014; Schøyen et al., 2017; Lloyd's Register, 2011.
Steel mills	Scrap steel from ships is sold to re-rolling mills for processing and re-use.	HRC, 2018; Frey, 2015; Rahman et al., 2016.
Workers	Workers undertake the shipbreaking work, usually by hand. In South East Asia, shipbreaking workers are primarily migrant workers who work at the yards a few months a year to make money for their families.	HRC, 2010; Sahu, 2014; Rahman et al., 2018.

Table 3: Summary and description of ship recycling stakeholders. Developed by authors based on existing literature (all sources in table above).

Having established who the industry's stakeholders are and the role they play, we can move forward with setting up the theoretical framework and methodology used in the data collection process, in laying the groundwork for the data analysis conducted in section 6. The stakeholder table provided here will be used extensively in subsequent sections, as we will be evaluating the stakes of each group and mapping out the relationships between them.

3.4. Summary

This section has discussed literature on sustainable shipping, sustainable ship recycling, and design for ship recycling. Throughout this discussion, we have identified a significant gap in the literature: different stakeholder perspectives in the ship recycling industry. Though there is ample literature on the environmental and social effects of ship recycling, industry regulation, and different ways of dealing with the industry's problem, there is a lack of consideration for the various stakeholder groups and their interests. In particular, the role of shipowners and their responsibility to ensure safe and sound disposal of their vessels is largely overlooked by academic literature, though it is heavily discussed in relation to other environmental issues as seen in the discussion on sustainable shipping, and it is heavily discussed by industry in relation to ship recycling. We find it extremely important to consider and understand where interests lie in the industry, in order to ultimately find solutions that consider all relevant perspectives. We have therefore finished this section with an overview and description of all industry stakeholders to be considered, which will play a key role in our analysis in later sections.

4. Theoretical framework

The previous sections have focused on contextualizing the thesis, firstly by describing the ship recycling industry and the key issues and challenges within it in section 2, and then by reviewing literature written on the industry and identifying the literature gap this thesis fills in section 3. In this section, we will develop the theoretical framework that will use for analysis in section 6, which will help us answer the paper's primary research question: *How is the concept of sustainable ship recycling perceived by different stakeholders, and how has it been codified into regulation, and implemented by the ship recycling industry?*

We approach the ship recycling industry from a stakeholder perspective, and analyze the industry through the different actors involved. In section 3.3, we outlined the different stakeholder groups and their roles in the ship recycling industry. In this section, we present a framework for stakeholder analysis that allows us to ascribe value to stakeholders through the power/interest matrix, and understand key areas of interest through the triple-bottom line.

4.1. Stakeholder analysis

The stakeholder theory of the firm argues that companies must look at other entities affected by their activities beyond shareholders. Stakeholders can be defined as "those individuals or groups that depend on an organization to fulfil their own goals and on whom, in turn, the organization depends" (Johnson, Whittington, Scholes, Angwin, & Regnér, 2017, p. 134). In the management field, however, stakeholder theory is heavily firm-centric, identifying stakeholder groups affected by or with a stake in a single firm's activities (Aaltonen, 2011; Cummings & Doh, 2000; Johnson et al., 2017; Missonier & Loufrani-Fedida, 2014), and discussing how these stakeholders should be managed by the firm from a communications and stakeholder management perspective (Cornelissen, 2014; Johnson et al., 2017). This is not a suitable approach to the ship recycling industry, which

operates in a number of fields and at different levels; globally, nationally, in the corporate sphere and the regulatory sphere, through voluntary initiatives, etc. However, it is an industry where a stakeholder approach is crucial.

We have therefore turned to other fields to see how they use stakeholder analysis, and have come across the field of health policy (Brugha & Varvasovszky, 2000; Hyder et al., 2010; Schmeer, 1999), and waste management systems (Heidrich, Harvey, & Tollin, 2009). Literature in these fields does not emphasize one specific firm, but rather considers all stakeholders on an equal basis. Brugha and Varvasovszky (2000) articulate the aim of stakeholder analysis as "[to] generate knowledge about the relevant actors so as to understand their behavior, intentions, interrelations, agendas, interests, and the influence or resources they can bring to bear on the decision-making processes" (p.241). They emphasize the overall goal of developing knowledge of the industry and its players. Similarly, Schmeer (1999) defines stakeholder analysis as the process of "systematically gathering and analyzing qualitative information to determine whose interests should be taken into account when developing and/or implementing a policy or program" (p.4). Hyder et al. (2010) argue that taking several stakeholder perspectives into account can (1) help initiatives succeed, (2) lead to better understanding between groups with different perspectives, and (3) help in developing strategies for dealing with key, decision-making stakeholders.

In evaluating the appropriateness of a stakeholder analysis in this project, Schmeer (1999) states that a stakeholder analysis should focus on a specific issue in order to be successful. She then outlines basic criteria for evaluating whether a given issue would benefit from a stakeholder analysis: the issue should be specific and concrete (such as the Hong Kong Convention and EU Ship Recycling Regulation), controversial (so that there is some disagreement among stakeholders and therefore value in the research), as well as current and important (Schmeer, 1999). The research area investigated in this paper is a good fit for all of these criteria, with the EU Ship Recycling Regulation

coming into effect on the 1st of January 2019, the Hong Kong Convention still going through the ratification process, and the breadth of stakeholder groups involved in the industry (as discussed at the end of section 3) with a myriad of perspectives. Additionally, it is important to note that the ship recycling industry does not have a single center of power, and no single stakeholder has enough power to change the industry alone. It is therefore highly suitable to carry out a stakeholder analysis.

4.1.1. Ascribing value to stakeholders

In conducting this analysis, it is of course not enough to simply identify the key stakeholders. An important feature of stakeholder analysis is that of ascribing some sort of value to the stakeholders, by analyzing features regarding how they interact with the industry and how large a role they play. Schmeer (1999) analyzes stakeholders based on the resources they have access to and the power they have to wield it. Hyder et al. (2010) consider analyzing stakeholders based on involvement in the issue, interest, influence, position adopted on the issue, and the effect of the issue on the stakeholder. Brugha and Varvasovszky (2000) also point to a political dimension of stakeholder analysis, where actors are evaluated based on level of influence, interest, and capacity to act (Lindenberg, 1981 in Brugha & Varvasovszky, 2000). Generally, these features all touch upon the same basic tenets: power or influence, and level of interest in the issue.

These are also the same basic tenets measured by the power/interest matrix used in stakeholder analysis for management purposes. Stakeholder mapping, according to Johnson et al. (2017), identifies the power stakeholders have to influence the issue, and the interest they have in the matter. It does not consider the stakeholders' opinion of a given issue, and this is mapped out in separate analyses in section 6. The power/interest matrix as outlined by Johnson et al. (2017), seen in figure 1 below, is the framework we adopt in order to analyze the stakeholders identified in section 3.3. This matrix allows us, in a very simple manner, to evaluate the level of importance of a stakeholder or stakeholder group by determining whether they have an interest in an issue (regardless of what their

opinion on the issue is) and whether they have the power to take action. The matrix is applied and discussed in sections 6 and 7.

Figure 1: Power/interest matrix. Developed by authors based on Mendelow (1986, in Johnson et al., 2017)

The 2x2 matrix as outlined above provides four different options: first, low power and low interest, which suggests a stakeholder that is not relevant or important to investigate. Here, we highlight the changing nature of stakeholder perceptions and opinions, and emphasize that though a stakeholder may not be important at this time, if the situation changes they may well move to one of the other quadrants. Stating that a stakeholder is not relevant should therefore be interpreted to mean that a stakeholder is not currently relevant, though this may change in the future.

A stakeholder with low power but high interest does not have a lot of say in the issue, though it affects them directly. This may describe marginalized or underrepresented groups, and it is therefore a group that attention should certainly be paid to, even though that may not always be the case. On the other hand, a stakeholder with high power but low interest may choose to intervene at any time, but is simply not interested in the matter at hand. This could be e.g. a government that chooses to prioritize one issue over another.

Finally, there are stakeholders with both high power and high interest. These are the key players in the industry or stakeholder ecosystem being mapped out. They have the power to take action, and the interest in doing so.

Particularly in relation to the power dimension, Johnson et al. (2017) point to the fact that there is always an unequal distribution of power and suggest sources of power that can be used to make a judgement about the level of power a stakeholder holds. For example, control of strategic resources, involvement in implementation (e.g. a shipowner cannot implement a responsible recycling policy without a yard willing to follow it), possession of knowledge and skills (e.g. green ship recycling consultancies), and informal influence. They further point to visible power indicators such as status, representation in powerful positions, and symbols of power. Representation in powerful positions is particularly relevant in this case, when we consider involvement of stakeholders like for example shipyard workers in processes such as the drafting of the Hong Kong Convention.

4.1.2 Triple-bottom line

Of course, it is not sufficient to simply state whether a stakeholder is powerful and interested in a topic if we do not understand their opinions and perspectives, and what they may use their power for. In order to analyze the stakeholders' perceptions of the sustainable ship recycling concept, we use the triple-bottom line concept (Elkington, 2004). The triple-bottom line considers three sustainability dimensions: environmental, social, and economic. It was developed by Elkington in 1994 in order to incorporate the social and economic dimensions into the environmental agenda, using language that would specifically appeal to business stakeholders (Elkington, 2004).

As is now evident from our previous summary of the industry, ship recycling is an economic activity. Shipowners sell their ships for scrap to recover some of their investment, shipbreakers try to keep costs low to make a profit when they sell scrap metal and other materials and objects taken from the vessel during the dismantling process. The chain continues, with scrap metal buyers re-rolling steel into plates that can be used for new projects, and local vendors selling furniture and equipment from the vessel directly to consumers. The industry would not continue to exist without economic incentive.

Jennings (2004) further defines the three elements as environmental responsibility, social equity, and economic performance. These three aspects cover the main issues of the ship recycling industry, discussed at length in sections 2 and 3. Environmental responsibility (to prevent pollution and environmental damage as a result of shipbreaking activity), social equity (providing decent working and living conditions for ship recycling yard workers), and economic performance (the need by all economic stakeholders to still make a profit from the activities). We use these three elements as the basis for our data analysis when it comes to (1) key industry issues and (2) defining sustainable ship recycling, in order to understand stakeholder priorities and perspectives.

5. Methodology

Having outlined the scope of this investigation, reviewed existing literature on the topic, and developed a theoretical framework to guide our analysis, we can dive into our methodology and research design. In this section, we will outline and discuss our research design, including our philosophy of science, methodological considerations, methods for data collection and analysis, as well as ethical considerations and possible data biases.

5.1. Research design

With our research question as our point of departure, we developed a research design to help us investigate and answer this research question. In this section we will delve into our research paradigm, approach to theory development, methodological choices and our research strategy.

In explaining the methodology of this thesis, we find it important to first delve into and explicitly state the research paradigm and worldview that we adopt. We follow the philosophy of critical realism as the lens through which our analysis is conducted. Critical realism proposes a layered ontology or view of the world (Figure 2), which acknowledges a reality independent of our own experience and that the empirical, i.e. the events that occur and are observed, do not tell the full story (Mikkelsen, 2005; Saunders, Lewis, & Thornhill, 2016). This philosophy focuses on identifying the underlying structures that shape our experiences, i.e. the real (Bryman, 2001 in Saunders et al., 2016; Mikkelsen, 2005), with the goal of counteracting inequalities and injustices (Mikkelsen, 2005). The ship recycling industry is characterized by large inequalities between stakeholders and power imbalances, both of which are explored in this paper. For this reason, we find that critical realism is well-suited to explore our research questions.

We aim to investigate perspectives on the ship recycling industry through what critical realism defines as 'the empirical', i.e. events that are actually observed and experienced (Saunders et al.,

2016). This is not to imply that all of our data will rely on first-hand accounts and observations, but rather that our data collection will focus on the manifestations of 'the real' perceived and interpreted by different stakeholders (Saunders et al., 2016).
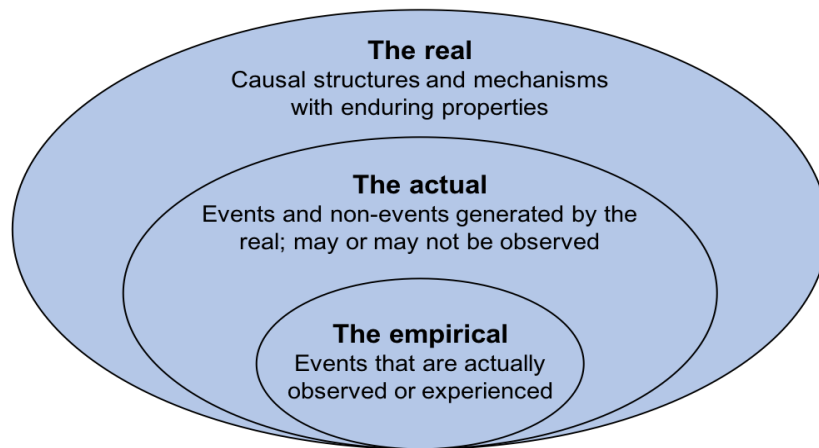
Figure 2: Stratified ontology of critical realism, developed from Saunders et al. (2016, adapted from Bhaskar, 1978).

In terms of our approach to theory development, we take a primarily deductive approach and develop a theoretical framework (presented in section 4) that we use to analyze our data (Saunders et al., 2016). Through our data collection we aim to explore the different perspectives held by stakeholder groups on sustainable ship recycling and industry regulation, and identify and map out the different discourses held by actors based on the power/interest matrix and triple-bottom line theories laid out in section 4.

In order to do this, we further adopt a multi-method qualitative study approach (Saunders et al., 2016), and collected data through semi-structured interviews as well as through numerous sources of secondary data, primarily industry reports that could be analyzed qualitatively. Our data collection and data analysis methods are further explained in sections 5.3 and 5.4.

We decided to take on a single case study research strategy that would allow us to study the shipbreaking industry and its various stakeholders in depth. Yin (in Blumberg, Cooper, & Schindler, 2008) defines a case study in the following way:

> an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clear evident; and in which multiple sources of evidence are used (p.375)

Considering that our research aims to investigate different stakeholder groups in the industry, their interactions, and their perspectives, context is of key importance to our analysis and understanding, which a case study strategy allows us to incorporate and explore fully as per Yin's definition above (Blumberg et al., 2008; Saunders et al., 2016).

This section has briefly explained the decisions made to develop our research design. The following sections will dive into the practical aspects, including our data collection and analysis methods, sampling, as well as ethical considerations and biases.

5.2. Sampling method

Since our research question requires that we investigate a breadth of stakeholders within the ship recycling industry, it was necessary to collect data from reliable and directly relevant sources. Additionally, since we aimed to reach representatives from as many different groups as possible, we determined that purposive sampling was the best way to do this within a reasonable time frame, as it allowed us to select the participants that would be the most relevant to answer our research questions (Saunders et al., 2016). Patton (2002, in Saunders et al., 2016) argues that non-probability sampling should find information-rich cases rather than statistically representative cases, which lends itself well to our case study research strategy. We found these information-rich cases through a preliminary stakeholder mapping as outlined in section 3.3, which is analyzed further in section 6.1.

We collected primary and secondary data from different stakeholder groups. For primary data collection, we used non-probability purposive sampling. We therefore only reached out to people working directly with ship recycling who already had a good understanding of the industry, such as CSR Manager, Head of Recycling, etc. We also asked interviewees if they were aware of other organizations, persons, or sources who could be relevant for our research, leveraging their knowledge of the industry and potentially providing insight into stakeholder groups that we were not aware of.

In determining our approach to data collection, it was necessary to limit the scope to simplify the research process. When reaching out to shipowners, for example, we decided to only reach out to Danish shipowners. Denmark was determined to be a suitable area for several reasons: firstly, as an EU member, it is affected by both the Hong Kong Convention and the EU Ship Recycling Regulation. Secondly, it is a prominent shipowning nation with a number of large shipping companies, making it relevant for the case study (HRC, 2018). Furthermore, Danish companies are required to report on their CSR activities (*Corporate Social Responsibility and Reporting in Denmark*, 2013), which provides ample secondary data. Finally, it allowed us to conduct interviews in person, and understanding the local language gave us access to local secondary sources. In line with this, we also considered Danish authorities and financiers.

When considering shipbreakers, we focus on ship recycling yards that use the beaching method, and are located in the Indian subcontinent. We do this for two reasons: firstly, it is by far the most common recycling method, used in the three biggest ship recycling nations as outlined in section 2. Secondly, because this is where the industry's issues with poor environmental and labor conditions originate from, and it is therefore the most relevant area of inquiry. Though we are keen on taking in the perspective from other ship recyclers, they are considered to be a separate stakeholder group and not the primary focus of this thesis.

During the outreach process we acknowledged two key issues: first, that some stakeholders would be difficult to reach, and possibly unwilling to cooperate. Second, that the time we could spend on data collection, as well as the scope of our research, was limited, and it was therefore necessary to prioritize some stakeholder groups over others. We therefore sought to supplement primary data with secondary data in the form of industry reports and other reliable secondary sources where possible. The data collection methods for both primary and secondary data are presented below, along with an overview of data collected in both groups.

5.3. Data collection method

In order to discuss the data collection methods necessary to carry out this investigation, it is important to restate our primary research question and explain the methods chosen in relation to how they will help us gain the information needed in our research.

How is the concept of sustainable ship recycling perceived by different stakeholders, and how has it been codified into regulation, and implemented by the ship recycling industry?

We collected data from a range of stakeholders to understand the different ways in which the sustainable ship recycling concept has been defined and perceived among stakeholders. Primary, qualitative data was collected through interviews to gather information about the stakeholders' definition and understanding of sustainable ship recycling, as well as their opinions of current industry regulation and, depending on the stakeholder, initiatives they have taken toward implementation.

The second part of our research question asks how the concept of sustainable ship recycling has been codified into regulation. In order to answer this, we obtained and analyzed the original regulation texts and any other guidelines released by the regulators (e.g. MEPC Guidelines for Safe and Environmentally Sound Ship Recycling, 2012) and supplemented the information obtained with

qualitative interviews to gain a better understanding of the process and stakeholders involved. The methods of data analysis are discussed in section 5.4.

Finally, we wanted to gain insight into the implementation of sustainable ship recycling in the industry. Like the second part of the question, this required both primary data and secondary data. Actors such as shipowners and shipbreakers were asked about how their activities have changed in relation to sustainable ship recycling and EU and IMO regulation. Then, we looked at secondary data such as companies' Responsible Ship Recycling Policies to see if and how these principles had been formalized internally. All of this is discussed in further detail in section 5.3.2.

5.3.1 Primary data

The primary data collected for this thesis consisted of qualitative interviews conducted with industry stakeholders. In order to answer the question of how the sustainable ship recycling concept is perceived by different stakeholders, it follows that we need an understanding of stakeholder groups, their opinions, and their overall worldview. We take the view that qualitative interviews are research instruments with the goal of knowledge collection, as outlined by Brinkmann and Kvale (2015). This interpretation seeks reports from the interview participants about their experiences that provide subjective meaning and knowledge about how they see the world (Brinkmann & Kvale, 2015; Mikkelsen, 2005). This fits into the critical realism philosophy, which views experienced events as the empirical, providing subjective meaning and knowledge about the real (Saunders et al., 2016).

In alignment with our research philosophy, we chose to carry out semi-structured interviews. Blumberg et al. (2008) define semi-structured interviews as interviews that "start with rather specific questions but allow the interviewee to follow his or her own thoughts later on" (p.385). They further state that the purpose is to gain an understanding of the interviewee's viewpoints regarding the areas being investigated (Blumberg et al., 2008). In order to carry out the interviews, we developed interview guides for different stakeholder groups as roadmaps (See Appendix I), and made changes

where relevant once an interview was confirmed. We found it necessary to maintain a structure (in the form of an interview guide) due to the fact that we wanted to explore a range of topics in a short period of time. Additionally, we wanted to draw comparisons between different groups and possibly different actors within a group. This made it beneficial to have the standard interview guides that could then be adjusted depending on the individual being interviewed and the organization they represented. In line with our understanding and interpretation of the interview guide, Blumberg et al. (2008) state that the two main functions of an interview guide are to guide the researcher's memory, and to increase comparability between interviews by ensuring that the same questions are asked in the same manner. Questions were generally not sent to interview participants ahead of time, though the interview request sent to them included an outline of the topics that the interview would cover (See Appendix II). Since our sampling method was purposive and we aimed to only interview participants working directly with ship recycling, preparing for the interview was not necessary. Additionally, giving the respondents time to prepare their answers would have made for more generic and thought out answers, as opposed to the more genuine nature of spontaneous answers.

However, we also wanted to enable interviewees to discuss and bring up issues that we may not have been aware of and may not have been included in our line of questioning. We therefore included some open-ended questions such as "What do you see as the main issues in the shipbreaking industry?" (See Appendix I). The interview guide was not developed to be followed to the letter, but rather as a guideline for the areas that should be discussed to enable us to (1) answer the research question, and (2) compare interview answers during analysis. However, if interviewees took a different direction in a question, follow-up questions were added or removed where relevant. Finally, it was important to consider the purpose of interviewing specific stakeholders when editing the interview guide. For example, our interview with Sveinung Oftedal at the Norwegian Environmental

Ministry did not follow the same pattern as the other interviews, as the purpose was mainly to provide background information about the drafting process of the Hong Kong Convention.

Interview requests for our primary data collection were sent out through email. We included a brief introduction to the topic, a direct request for an interview, and a statement that their interview could be anonymous and confidential if they wished. A one-pager with further information was included with each interview request, personalized to each person and including further details about topics that a potential interview would cover, a request to record the interview to ease the data analysis process, and re-stating that the interview could be anonymous and confidential if desired.

Once the interview began, we once again stated that the interview would be recorded, and asked if this would be okay. In cases where it was not, we wrote notes. In some cases, interviewees also asked to review any quotes that would be used, prior to submitting the thesis, in order to determine if anything should be anonymized. In other cases, interviewees may have mentioned during an interview that a specific comment or section should not be included or should not be attributed to them. In the interest of protecting the wishes of our interviewees, we have thus decided not to include full interview transcripts as Appendices for our thesis. However, quotes used in the analysis are attributed to the speaker and/or their respective organization, or anonymized where necessary.

Data was recorded and transcribed through Otter, a recording software that transcribes audio automatically. We checked for accuracy in all the transcripts, though sections that were considered irrelevant for analysis such as introductions were not checked. We conducted a total of 15 interviews in person, over Skype, and over the phone, spanning a total of seven countries. A summary is provided in the table below. One participant asked for their contributions not to be included in the analysis, and wished to remain anonymous. We also conducted an interview with a Danish shipowner that did not wish to be quoted directly and wanted to remain anonymous. The data collected from these two interviews is not used in the analysis, and they are therefore omitted from the table below.

Stakeholder group	Organization	Interview participant	Position	Date	Format
Shipbreakers' association	International Ship Recycling Association	Reinoud Pijpers	Director	8/4	Skype
Regulator	Danish Ministry of Environment and Food	Amalie Wang Norus	Head of Section	2/4	In person
Cash buyer	NKD Maritime Limited	Narinder Dheir	Director	8/4	Phone call
Shipowners' association	BIMCO	Aron Sørensen	Head of Maritime, Technology & Regulation	4/4	Phone call
Shipowners' association	Danish Shipping	Asbjørn Overgaard Christiansen	Acting Director, Security, Environment & Maritime Research	28/3	In person
NGO	Shipbreaking Platform	Ingvild Jenssen	Executive Director	27/3	Skype
Consultancy	Grieg Green	Magnus Hammerstad	Head of Recycling	26/3	Skype
Shipowner	DS Norden	Kristina Kunigenas	CSR & Compliance Manager	26/3	In person
Shipowner	DFDS	Poul Woodall	Director of Environment & Sustainability	5/4	In person
Multi-stakeholder initiative	Ship Recycling Transparency Initiative	Nicole Rencoret	Head of Communications Development	11/4	In person
Shipbreaker	Shree Ram Group	Jemish Donda	Operational Manager of Ship Recycling Yards	21/4	Call
Regulator	Norwegian Ministry of the Environment	Sveinung Oftedal	Norwegian Head of Delegation to the IMO	12/4	Call
Class society	ClassNK	Johnny Stamnesfet	General Manager, Principal Surveyor	12/4	In person

Table 4: Interview participants

We spoke to three Danish shipowners: DS Norden, a dry bulk carrier and product tanker, DFDS, a freight and passenger carrier operating in Europe. We had a third anonymous interview that was not used in the analysis, and collected secondary data from other Danish shipowners, which is discussed in the secondary data section below.

We also interviewed Danish Shipping, which represents Danish-flagged and Danish-owned ships, and BIMCO, the Baltic and International Maritime Council, which is the World's largest shipowners' association ("About Us," n.d.-b). Finally, we spoke to the Ship Recycling Transparency Initiative (SRTI), an industry initiative that works to improve transparency in ship recycling among shipowners, cargo-owners, and financiers.

In terms of shipbreakers, we interviewed the Shree Ram Group, which owns several ship recycling plots in Alang, and NKD Maritime, the cash buyer they work with. Shree Ram is one of Maersk's partner yards in Alang, and the sale of all Maersk vessels to Shree Ram have been carried out by Narinder Dheir at NKD Maritime. They also handled the transaction of an Evergas vessel to Shree Ram in 2018, which is discussed in section 6. An important note to make at this point is that NKD characterizes its relationship with Shree Ram as an "exclusive partnership" ("Background," n.d.), but DNV-GL states in its EU audit report of Shree Ram that Shree Ram fully owns NKD Maritime (DNV-GL, 2019). We also interviewed the International Ship Recycling Association (ISRA) in the Netherlands, which claims to represent the "strongest environmentally responsible yards in the world" ("About Us," n.d.-a). The yards it represents are all located in Europe, Turkey, China, and Hong Kong, and none use the beaching method.

In the group of regulatory stakeholders, we interviewed the Danish Ministry of Environment and Food, which handles ship recycling policy at the national level and sits in the European Commission working group on ship recycling, and Sveinung Oftedal at the Norwegian Ministry of the Environment, one of the original authors of the Hong Kong Convention. We also spoke to the

Founder of the NGO Shipbreaking Platform, which has been one of the most vocal critics of industry practices and has campaigned to end beaching, putting pressure on shipowners and regulators to take action.

Finally, we spoke to ClassNK, which issues HKC Statements of Compliance to yards, and Grieg Green, a green ship recycling consultancy based in Norway that provides IHM development services and assists shipowners in selling their ships to recycling yards. Grieg Green is fully owned by Grieg Star, a Norwegian, family-owned dry bulk carrier.

5.3.2. Secondary data

Although our research relied heavily on primary data, secondary data was used extensively in a number of cases. Firstly, to access and analyze regulatory texts. Secondly, to supplement primary data in cases where relevant secondary data was available, and thirdly, instead of primary data in cases where we were unable to reach certain stakeholders or where they did not agree to be interviewed. In considering whether the secondary data found was appropriate, we used the source evaluation factors outlined by Blumberg et al. (2008): purpose (why does the information exist?), scope (how old is it, how much is available, how was it collected?), authority (what are the credentials of the author or institution?), audience (who was it written for?), and format (where and in what format is it found?).

The shipbreaking industry as a whole lacks transparency and accountability, and with documented sub-standard facilities and conditions in some cases, we understood from the beginning that reaching some of these actors could prove to be difficult. It was therefore important to have an overview of the secondary data available and how we may be able to leverage it to fill any gaps in our primary data. We aimed to mainly use industry and governmental reports to ensure that they came from reliable sources and from a relevant time period, avoiding data published prior to the adoption of the Hong Kong Convention in 2009. In some cases, older texts are used where relevant, such as

the 2004 ILO guidelines on Safety and Health in Shipbreaking, which are referred to by a number of more recent texts including both the HKC and EU-SRR.

Two key pieces of secondary data collected for this project were the regulatory texts of the IMO's Hong Kong Convention and the EU Ship Recycling Regulation. These documents were pivotal to our research, as they were directly linked to our research question. We also used secondary data to supplement interviews through e.g. shipping companies' sustainability reports, as well as any other company documents dealing with ship recycling. It is important to note that these sources are inherently biased as they only reflect the perspectives and beliefs of the organizations they represent, but this is a strength for our research, where we seek to examine the worldview of the organizations we collect data from. Additionally, the absence of data can also be very telling, e.g. in cases where ship recycling is not mentioned at all in their reporting. We delve into this matter in the analysis section.

Although secondary data was widely available for some stakeholders such as shipowners, this was not the case for every stakeholder group. We struggled to find secondary data from organizations in India, whether they were ship recycling yards, workers' unions, or NGOs. Some had little to no presence on the internet, while those who did had outdated or irrelevant information. We were able to find some secondary data from the Ship Recyclers' Industry Association (SRIA) in the form of a member's newsletter from 2013 (Ship Recyclers' Industry Association, [SRIA] 2013). Here, they discussed their views on green ship recycling, the Hong Kong Convention, among other highly relevant topics. It should be noted that the overall quality of the source is low, and we were unable to find a working website for the SRIA to verify the information. However, it was the only source of its kind that we were able to find, and provides a contrasting perspective that was difficult to obtain through primary data. We therefore decide to use it, taking into consideration the disclaimer above.

We also briefly discuss a press article about the Alang Sosiya Ship Recycling and General Workers' Association (ASSRGWA).

Other secondary data sources used include news articles published in industry publications such as Lloyd's List, ShippingWatch, etc. The ship recycling industry is constantly changing. As an example, in the time we spent conducting our research for this thesis, four countries ratified the Hong Kong Convention. In some cases, these publications were much faster at reporting on and analyzing new developments in the industry. Additionally, as well-known industry publications, they could speak to stakeholders that we did not have access to, providing us with valuable secondary data. We must, however, consider their bias. Publications such as Lloyd's List are not impartial, and often publish opinion pieces from industry stakeholders. This can be an advantage where clearly disclosed, but may be more difficult to establish in other cases. Additionally, the purpose of these articles is primarily to keep shipping stakeholders informed of new policies and changes such as ratifications, and we can therefore not guarantee data quality standards. Reichman (1962, in Saunders et al., 2016) state that news publications may select key points and will not always include supporting data. However, as stated earlier, they are able to provide up-to-date news in a rapidly changing landscape, as well as to provide access to sources and information that would have been impossible to obtain otherwise. An overview of secondary data is provided below.

Stakeholder group	Organization	Type of source(s)
Regulators	IMO	- Hong Kong Convention text
	EU	- EU Ship Recycling Regulation text
		- Statement from Commissioner for the Environment
Shipowners	Maersk	- Sustainability report
		- Responsible Ship Recycling Policy
		- Press articles
	Evergas	- Website
		- Press article on ShippingWatch
	Ultranav	- 2018 CSR Report
	TORM	- 2009 CSR Report
		- 2015 Listing prospectus
	DS Norden	- 2018 CSR Report
		- Responsible Ship Recycling Policy
	DFDS	- 2018 CSR Report
	Monjasa	- Personal communication
		- Press article on ShippingWatch
	J. Lauritzen	- 2018 CSR Report
		- Responsible Ship Recycling Policy
Shipbreakers	Ship Recycling Industries Association (SRIA)	- Member newsletter
		- Press interview
Cash buyer	GMS	- Press interviews
Recycling state	Gujarat Pollution Control Board	- Column in SRIA member newsletter
Financier	Danske Bank	- Announcement (on Danske Bank website)
	Norwegian Government Pension Fund	Council on Ethics recommendation report
	Nordea	Responsible Ship Recycling Standards
Workers' union	IndustriALL	- Article (on IndustriALL website)
		- Shipbreaking Action Plan for 2019-2022
	ASSRGWA	- Press article

Table 5: Secondary data

5.4. Data analysis method

Now that we have discussed data collection methods for primary and secondary data, we can move on to discuss data analysis methods. The overall data analysis technique used was a thematic analysis, defined as "a technique used to analyze qualitative data that involves the search for themes, or patterns, occurring across a data set" (Saunders et al., 2016, p.729).

Overall, this is a generic approach to qualitative data analysis that allowed us the maximum level of freedom to determine categories and thematic areas according to our research question. Additionally, because we seek to answer three distinct questions within our main research question, different kinds of data, or even answers to different interview questions within one interview, are analyzed in the same manner but looking for different categories.

The first thing we did was conduct a stakeholder analysis using the stakeholders identified in section 3. This contextualized the stakeholders, both within the industry and in relation to one another. We visualized stakeholders in different ways, firstly by mapping them out to illustrate the key stakeholder categories, secondly by placing them into a Venn diagram using the three key categories and looking at where stakeholders overlap and who they interact with, and finally, by placing them into the power/interest matrix to evaluate their stake in the industry and identify any potential trends linking to the three research sub-questions.

To answer the first sub question (*how do stakeholders in the ship recycling industry perceive the concept of sustainable ship recycling?*), we looked at two topics: first, what stakeholders see as the main issues in the industry, which helped us understand their priorities, and second, what stakeholders consider to be sustainable ship recycling. These two topics were analyzed based on the triple-bottom line principles outlined in the theoretical framework, though allowing for the emergence of new themes. By doing this, we aim to see what the sustainable ship recycling concept entails, and what areas stakeholders are most concerned about.

The second sub-question relates to how sustainable ship recycling has been codified into regulation. In order to answer this question, we looked at three areas: (1) the regulatory text of the Hong Kong Convention and the EU Ship Recycling Regulation, (2) stakeholders' experiences in the drafting process for both regulations, and views on who was and was not included in that process, and (3) stakeholders' opinions on both pieces of regulation. This helps us understand what the purpose and key differences between the pieces of regulation are, what interests they represent , and how stakeholders feel their interests are represented by the regulation. Here, we refer back to the triple-bottom line and compare the areas prioritized by the regulation to those prioritized by stakeholders in the previous question.

Finally, to answer the third sub-question (*how has the sustainable ship recycling concept been implemented by stakeholders in the industry?*), we looked at how shipowners and shipbreakers have implemented sustainable ship recycling practices in their activities, and how other stakeholders view industry initiatives. This gave us three different views on implementation from stakeholders.

5.5. Ethical considerations and biases

We have attempted to discuss some ethical considerations (section 5.3.1.) and biases in data (section 5.3.2.) throughout this section where relevant. Here, we will discuss any other ethical issues and potential biases that have not been previously discussed.

Firstly, we want to emphasize the importance of allowing interviewees to be anonymous. We dealt with an industry that is generally difficult to access for outsiders, and where many stakeholders know each other and work closely together. It was therefore necessary to allow interviewees to be anonymous if they wished, in order to allow them to be more open and honest in their answers without fearing repercussions. Some interview participants also allowed us access to some of their contacts

on the condition of anonymity, and in those cases it was of high priority to protect their identities not only in the research but in our interactions with others.

Another potential bias to consider is that of the interview participants themselves. We interviewed participants not as individuals, but as representatives of the organizations and institutions that employ them, or that they are members of. We must therefore consider the individual perspectives and biases that these representatives may have, and whether they accurately represent the opinions of their employers. Given that we have chosen a critical realism perspective where we value the individual perspectives of our interviewees, this is not in itself a weakness, though overall we want to ensure that they represent their institutions as much as possible. In cases where this was difficult to ascertain, or where interviewees have asked to review their answers prior to submission, we have consulted with participants after the interview. This was done for two reasons: first, to give them the opportunity to anonymize any statements they did not want attributed to them, and second, to confirm our understanding of their responses and ask for clarifying information in cases where things were unclear.

One of the issues faced during the data collection process was non-response to interview requests. The shipbreaking industry, as previously discussed, faces a lot of criticisms from outside sources and generally there is a lack of available information and transparency from some stakeholder groups, as discussed in the secondary data section (5.3.2.). Additionally, it was challenging to find contact information for groups like workers and workers' unions who do not have a presence online, as they are often migrant workers who work in an informal capacity (ILPI, 2016). We recognize that the inability to get in contact with some stakeholder groups means that our research is biased toward Western stakeholders, as there is a lack of balance between stakeholder groups. One of the ways in which we tried to overcome this was by gathering data about these groups through secondary sources, as discussed in the secondary data section (5.3.2.), in which case we sought to validate the data by

establishing that it came from a reliable source, and by clearly stating that the information had been obtained from a secondary and not a primary source.

5.6. Summary

This section has discussed the research design developed to undertake this research and answer our main research question. Through the lens of critical realism and an inductive approach to theory development, we have developed a multi-method qualitative study and a case study research strategy, collecting primary data through semi-structured interviews and secondary data to supplement and in some cases, substitute primary data.

In collecting data we used a non-probability, purposive sampling method in order to ensure that all of the data collected came from qualified sources. We further evaluated secondary data sources to ensure their reliability, and in cases where this could not be fully established, to weigh the benefits versus the costs of using a certain source.

Finally, we discussed ethical considerations and potential biases in the data collection process and acknowledged the potential bias in our data as a result of non-responses in interview requests and lack of online presence of a number of stakeholder groups.

6. Analysis

This section will analyze data collected from the samples outlined in section 5.3 in order to answer our research question: *How is the concept of sustainable ship recycling perceived by different stakeholders, and how has it been codified into regulation, and implemented by the ship recycling industry?*

First, we will present our stakeholder analysis and power/interest matrix. This allows us to develop an understanding of the position each stakeholder group has in the industry, in terms of the power they hold to bring about change, and the interest they exhibit in doing so. We have divided the rest of the section according to the three sub-questions presented in the introduction:

SQ 1: How do stakeholders in the ship recycling industry perceive the concept of sustainable ship recycling?

SQ 2: How has the concept of SSR been codified into regulation in the HKC and the EU-SRR?

SQ 3: How has the industry implemented the concept of SSR?

This allows us to take a structured approach to answering all parts of our research question. Furthermore, comparing the results from the stakeholder analysis to the views discussed in the three sub-questions allows us to identify trends and patterns among stakeholder groups.

6.1. Stakeholder analysis

In the literature review presented in section 3, we compiled a table of ship recycling stakeholders mentioned in the literature, which was used to guide our data collection process and point us toward the stakeholder groups that were key to answering our research question. The table simply described the stakeholder groups and outlined their role in the industry.

Now that we have collected the necessary data and provided an overview in section 5.3., we can build upon the initial table to carry out a stakeholder analysis, which helps us develop an in-depth

understanding of the industry and the way stakeholders interact with, and relate to, one another. We do this in two ways: (1) by mapping out the stakeholders to develop a visual representation of the industry and of where stakeholders are placed in relation to each other, and (2) through a Venn diagram that illustrates where stakeholder groups overlap and helps us identify which stakeholders play central roles and which are more peripheral.
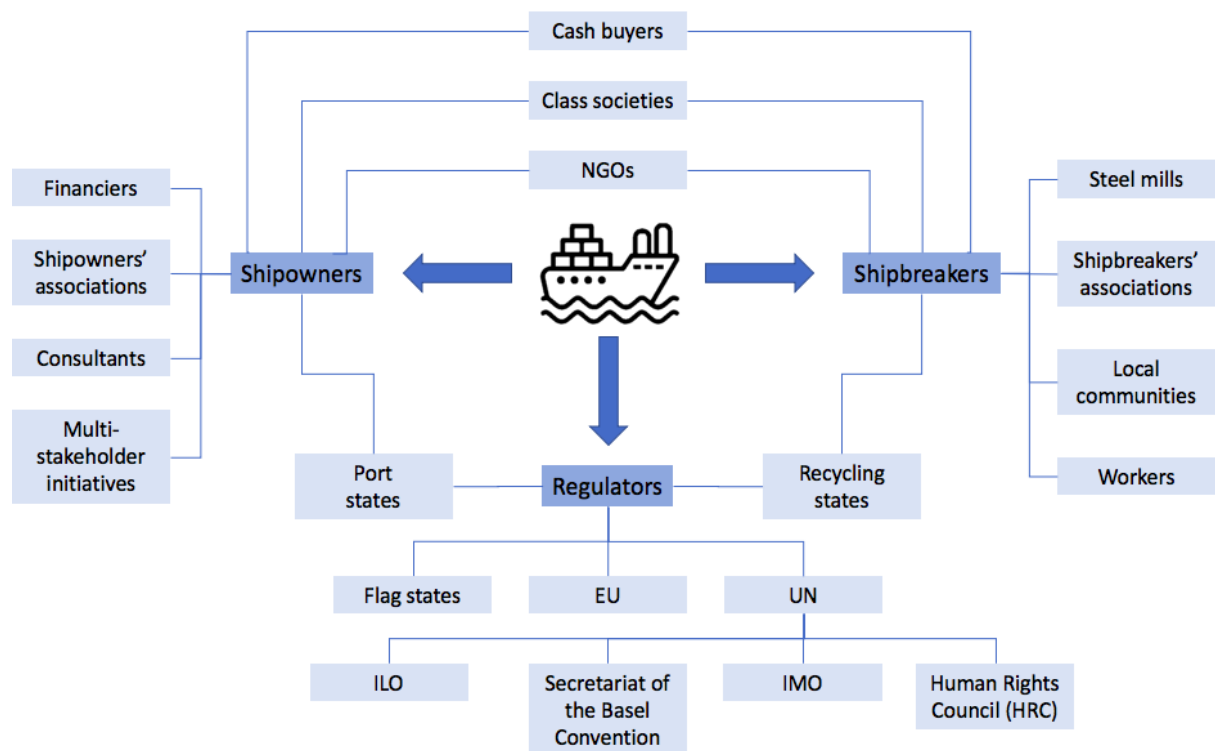
Figure 3: Stakeholder map of the ship recycling industry. Developed by authors.

In order to map shipbreaking stakeholders, we considered the role of each stakeholder as outlined in section 3.3. Three primary categories emerged: shipowners, shipbreakers, and regulators. All other stakeholder groups could either be nested under one of the three key groups, or acted as intermediaries of some sort and can be seen linking the groups (cash buyers, class societies, and NGOs). In the figure, the stakeholder groups shipowners and shipbreakers are stakeholders in and of themselves, but the third group (regulators) merely represents a category.

On the shipowner side, we see industry-driven initiatives such as the Ship Recycling Transparency Initiative (SRTI), financiers, consultancies, and shipowners' associations. As discussed in section 5.2., we focus on Danish shipowners. We therefore also limit other stakeholders in this category to stakeholders serving the Danish market when it comes to the data analysis. On the shipbreaker side, we see shipbreakers' associations, and workers as the most direct stakeholders. Steel mills that purchase scrap steel from shipyards and local communities are also directly affected by the shipyards' activities. When we refer to local communities, this could be local merchants who profit from selling equipment from the vessels, or who sell food to the workers, but it may also refer to fishermen who fish in the beaches near the shipyards and catch contaminated fish. As discussed in section 5.2., we focus on beaching yards in this category, and the stakeholders around them. However, we value the perspective of other shipbreakers, and therefore also consider the ISRA in the Netherlands which represents yards that do not use the beaching method.

While shipowners and shipbreakers are stakeholders in and of themselves, the third group (regulators) merely represents a category. Within it, we place international and supranational bodies (i.e. different UN bodies, and the European Union). In addition to these, we also consider flag states, port states, and recycling states to be relevant stakeholders on a national level.

Mapping out the industry in this way allows us to see how the different stakeholder groups are clustered together. This is useful in helping us identify trends between groups based on their views and different perspectives. However, it does not allow us to clearly see interactions and overlap between groups that may be involved in all three categories, such as NGOs. NGOs like the Shipbreaking Platform advocate for clean ship recycling, pressure regulators to impose rules on the industry and shipowners to recycle their ships more responsibly, while trying to protect workers and local communities. This makes them difficult to map out accurately. Figure 4 below shows a Venn diagram that includes the three primary categories and the stakeholders nested within them in the map

above. However, it presents an alternative view that visualizes overlaps between groups, and emphasizes the core group in the middle.
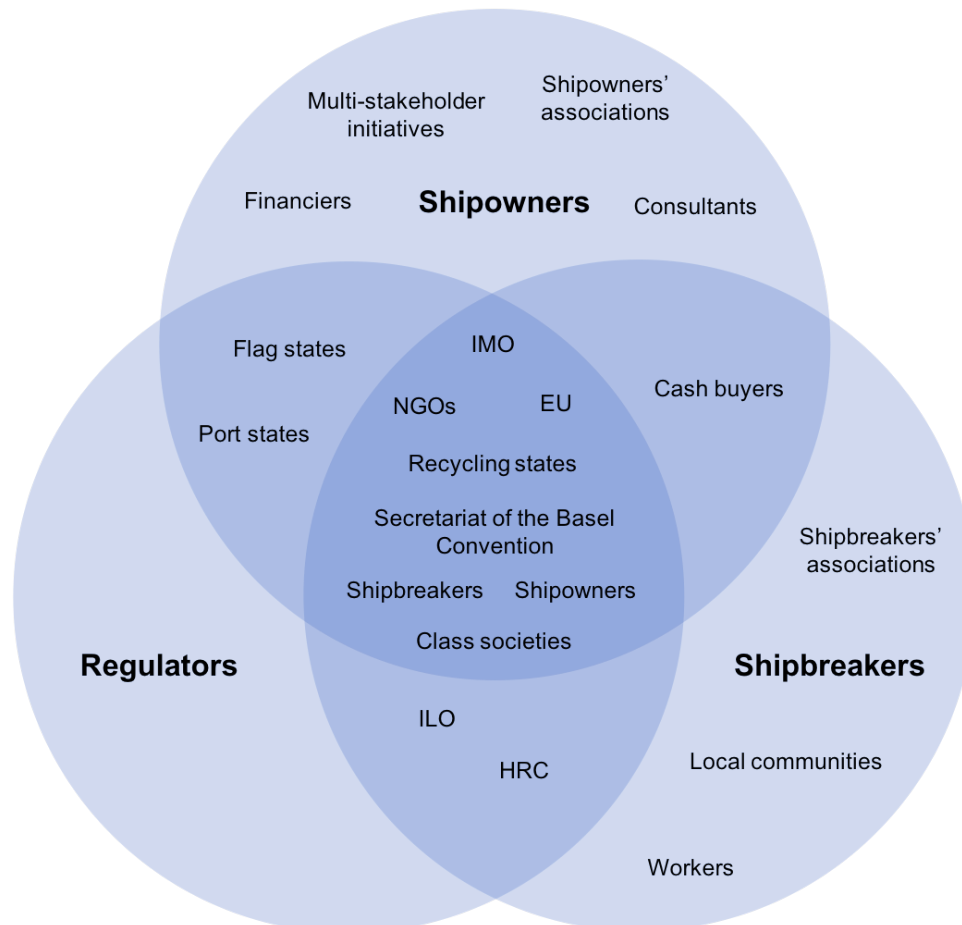
Figure 4: Venn diagram of stakeholder group relationships. Developed by authors.

We can see that while shipowners and shipbreakers both have stakeholder groups individual to them, such as workers and financiers, all regulators can be found in overlapping regions, and are thus part of more than one group. Though this may look strange when represented visually, it makes sense when we consider that regulation cannot exist without someone, or something, to regulate. Generally, we see that the core group in the middle consists of shipowners, shipbreakers, regulators, NGOs, and class societies. This makes sense when we consider that shipowners and shipbreakers are the two key stakeholders in the industry, without whom there would be no industry, while the EU,

IMO, and Secretariat of the Basel Convention are responsible for the three key pieces of regulation that govern the industry. Additionally, recycling states have their own national regulation that affects both shipowners and shipbreakers.

Other regulatory bodies such as the ILO and Human Rights Council focus primarily on improving conditions for the workers in the yards (particularly in their ship recycling activities) and are therefore not considered central. NGOs are placed centrally due to their ability to apply pressure to all three main stakeholder groups. Finally, class societies are placed in the center due to their interaction with all groups. They help both shipowners and shipbreakers comply with regulation by providing IHM services and issuing Statements of Compliance to ship recycling yards in accordance to the Hong Kong Convention. However, we discuss whether this translates to power and interest in the matrix below.

6.1.1. Power/interest matrix

Having visualized the stakeholders, we can apply the power/interest matrix presented in section 4.1.1. to ascribe value to the different stakeholder groups. In order to do this, we do not measure stakeholders' power or interest on a spectrum, but classify them as high or low according to the matrix. We may also use an arrow to denote whether a stakeholders' power or interest is increasing or decreasing, if relevant.

We define power as the ability to unilaterally bring about change in the industry, or on other powerful stakeholders (who are, in turn, able to unilaterally bring about change in the industry), and we measure interest in terms of public displays of interest in the industry, whether for or against change. We may also consider the purpose of the stakeholder, e.g. the category NGO encompasses organizations that focus on ship recycling, whereby interest is also extremely high. Another example may be ship recycling workers, who may not have a large online presence (and therefore a lack of "public displays of interest"), but whose livelihoods depend on the industry, and who would be

qualified as high interest. Of course, this analysis is based on the researchers' subjective value judgements of both criteria. We present the power/interest matrix below, followed by a discussion of the reasoning behind the placements.

Figure 5: Power/Interest matrix of shipbreaking stakeholders. Developed by authors.

On the power dimension, we see clear trends in terms of power if we define it as the ability to unilaterally bring about change in the industry, or on other powerful stakeholders (who are, in turn, able to unilaterally bring about change in the industry). The two key stakeholders that immediately come to mind are shipowners and shipbreakers, as the industry would not exist without either of these groups. Shipowners have both high interest and the power to decide where and whom to sell their vessels to. However, an interesting question comes up when we consider shipbreakers: their power is theoretically high, as they are theoretically able to unilaterally change the industry. However, in practice, their income and livelihood are fully dependent on shipowners to sell them vessels, and any changes they make would require support from other stakeholders to succeed. We therefore mark its power as low since they are not in a position to easily bring about change. However, it is clear that

their interest is high. Furthermore, we consider both shipowners' associations and shipbreakers' associations to represent the same interests and hold the same power as shipowners and shipbreakers so they are not included as separate groups in this matrix.

Another high power stakeholder group is regulators. This includes flag states, the EU and the different UN agencies (i.e. the IMO, ILO, HRC and Basel Convention Secretariat which is housed by UNEP). The EU was able to circumvent the slow IMO ratification process and develop its own regulation to change the industry. Though we can question the EU's power in terms of implementing the List and avoiding issues such as re-flagging, at least on the point of IHMs it is clear that it is able to bring about large-scale change to the industry. The same can be said about the UN and the IMO, since despite the fact that the HKC has not been ratified by sufficient countries it has still brought about change in practices in many places in the industry. In terms of interest, we believe theirs to be high as they are responsible for the two key pieces of regulation in the industry.

Financiers hold high power because they can exert control over shipowners. Their interest, traditionally low, is increasing as they become more aware of the problem and begin to assert their power and take action, pressuring shipowners to change their recycling practices. This increase in interest is symbolized by an arrow on the figure above, though they are still classed as low interest as current involvement is limited. Flag states are responsible for verifying ships' IHMs and hold the power of enforcing the law. Therefore, they hold considerable power, but their interest is questionable and varies greatly between states. We therefore consider their interest to be low. Similarly, recycling states hold high power but low interest. Local regulators have the power to enforce international regulation and may have their own regulation for ship recycling. However, interest is often low in the recycling states, in some cases because of the financial benefits the industry brings, or due to general corruption and lack of enforcement.

When considering stakeholders with high interest but low power, cash buyers are undoubtedly key players in the industry. By selling vessels to the highest paying yards, they perpetuate the industry's poor practices. However, their activities are forced to change as soon as regulation comes into effect, and their power is therefore relatively low. In fact, we can see that the largest cash buyers have started to promote green ship recycling services on their websites ("Green Recycling," n.d.; "Responsible Recycling," n.d.), adapting to the industry as it changes. Consultancies help shipowners prepare IHMs and recycle their ships according to regulation. They can also replace cash buyers as intermediaries. Therefore their interest is high and power low. Local communities are highly affected by the industry and therefore have high interest, but they hold little power. Multi-stakeholder initiatives in the industry have high interest since they are specifically focused on ship recycling and represent the interests of different players on this issue. As they draw more stakeholders in and become more commonplace in the industry, their power will increase, but they are currently in the early phases and thus considered low-power for now. NGOs are a high interest group and have brought much attention to the issues of the shipbreaking industry. However, they hold no considerable power and can only pressure other stakeholders, such as regulators and shipowners, to improve conditions. The workers have a high stake since their work depends on the industry. Unfortunately, their power is not high, which can be seen in the poor working conditions in many shipbreaking yards.

Finally, as with flag states, port states are responsible for inspections and verifications of the IHM and Ready for Recycling Certificate under the HKC. They hold power in that sense, though lower power than the flag states, and due to their low interest this power is not always exercised. Like with flag states, this varies significantly by state. Steel mills have an interest in the industry since their steel supply depends in large part on ship recycling, but since they do not have a high stake in comparison to other stakeholders we consider them low-interest players. Further, the price of scrap steel is dependent on external circumstances so they are not direct drivers of scrap vessel prices. We

therefore consider their power low. As discussed in section 3.3, class societies provide technical standards for ships, consult with shipowners to develop IHMs and issue Statements of Compliance with the HKC to yards. Although they are heavily involved in the industry, we do not mark them as high power stakeholders since they profit from helping the industry comply with regulation but do not drive change in the industry. We consider their interest to be low as well, since ship recycling is only part of the many projects they work with.

All in all, based on this matrix, we define key players in the industry to be regulators and shipowners. These are stakeholders with both high power and high interest and thereby the will and ability to affect change. The power/interest matrix helps us visualize the perceived power and interest of each stakeholder group. It allows us to group stakeholders together based on these two factors, so that we may identify power structures and perhaps look at those that are being left behind, who have high interest and may depend on the industry but do not have the power to make changes or advocate for themselves. This is the case for NGOs, shipbreakers, consultancies, workers, local communities, cash buyers and multi-stakeholder initiatives and it is the largest group in our matrix.

6.2. Perception of the sustainable ship recycling concept

The first sub-question we consider relates to the definition of sustainable ship recycling. We aim to answer the question: *How do stakeholders in the ship recycling industry perceive the concept of sustainable ship recycling?* In the analysis of this topic we thus focus on (1) what stakeholders perceive as the main issues in the ship recycling industry, and (2) how stakeholders define sustainable ship recycling. This is done by analyzing data from industry players discussing these two topics. By looking at what stakeholders see as the main issues in the industry, we can see where their priorities lie according to the triple-bottom line, which helps us understand how their focus differs in terms of sustainability (social, economic, and environmental) and sustainable ship recycling. Additionally, we

can identify categories that do not fit into the triple-bottom line but which are of importance to the stakeholders.

6.2.1. Stakeholder perceptions of the industry's main issues

In order to help us answer the question of how the concept of sustainable ship recycling is perceived by different stakeholders, we investigated what stakeholders saw as the main issues in the industry. The following table shows a summary of stakeholder responses or comments on this issue.

Stakeholder type	Stakeholder	Key points and triple bottom line considerations
Shipowners	DS Norden	Emphasizes social sustainability. Safety standards for shipbreaking workers need to improve, and the HKC needs to be ratified to improve standards.
	DFDS	Poor conditions and practices in most recycling yards and questionable standards of cash buyers. Emphasized social and environmental sustainability.
	Maersk	There is a lack of international regulation, excessive working hours, and substandard environmental and social conditions (Maersk, 2019). Covers social and environmental sustainability.
Shipowners' associations	BIMCO	HKC cannot enter into force without support from the big recycling states.
	Danish Shipping	Bad recycling practices are harmful to the environment. Shipowners that recycle irresponsibly are not held accountable. Global regulation is needed to ensure fair competition. Covers all aspects of the triple bottom line.
Regulators	Danish Ministry of Environment and Food	The industry cannot agree on basic facts, Statements of Compliance are not valid by law. Inadequate recycling has harmful effects on workers, the environment, and local communities. Emphasis on social and environmental sustainability.
	Norwegian Ministry of Environment	Global regulation needs to be enforced for the industry to improve. Yards in India and Bangladesh lack the capacity to invest in upgrading. Emphasizes economic sustainability.

	Gujarat Pollution Control Board (GPCB)	Occupational health and safety (OHS) concerns, environmental pollution affects local communities (SRIA, 2013). Emphasizes social and environmental sustainability.
Shipbreakers	Shree Ram	Economic focus: 'Green' yards cannot compete with low standard yards that are able to pay more. Shipowners need to take responsibility and give discounts to 'green' yards.
	SRIA	It is difficult for yards in India to remain competitive against other markets (e.g. Bangladesh) with national and international regulation constantly changing ("SRIA," n.d.). This emphasizes economic sustainability.
Cash buyers	NKD Maritime	Yards in the Indian subcontinent should be able to gain access to the EU List, which does not have sufficient capacity. Believe this does not happen because the EU is anti-beaching.
	GMS	Worker safety and environmental pollution are key issues, but yards need an incentive to improve. Emphasis on all aspects of the triple bottom line.
NGO	Shipbreaking Platform	The industry is reluctant to change because it's too easy to avoid being held accountable. Ships are sold to the highest bidder, which are the beaching yards. Emphasizes economic sustainability.
Consultancy	Grieg Green	Regulation is insufficient because it's not global, so shipowners can keep doing the things that earn them the most money. Cash buyers enable this behavior. Focus on economic sustainability.
MSI	SRTI	There is a need for practices to change through (1) transparency, and (2) ensuring that policy is implemented.
Class Society	Class NK	Emphasized economic sustainability by saying it's too expensive to recycle responsibly.
Financiers	Danske Bank	Discharge of hazardous wastes and social issues relating to working conditions ("Danske Bank supports responsible ship recycling," 2018). Emphasis on social and environmental sustainability.
	Norwegian Pension Fund	Highlights social and environmental sustainability: Beaching is unacceptable due to environmental damage and human rights violations (but only deals with Bangladesh). (Council on Ethics, 2017).

Table 6: Summary of stakeholders' opinions on main issues in the ship recycling industry. (Statements from other sources than primary interviews are cited specifically).

Clear trends emerge when we look at the key points in every stakeholder group. First and foremost, though most of the responses deal with at least one aspect of the triple bottom line, we identify a category that is mentioned by 11 out of 18 stakeholders: regulatory issues. Some stakeholders mentioned the issue of ratifying and implementing the Hong Kong Convention (DS Norden, BIMCO, the Norwegian Ministry of the Environment, SRTI). Others focused on the EU-SRR, with NKD Maritime mentioning the ship recycling capacity of the List and its reluctance to accept beaching yards, and Grieg Green stating that regulation must be global in order to be effective. In our interview with Danish Shipping, Christiansen did not refer to a specific piece of regulation, but argued that global regulation is necessary to "ensure that you don't have this unfair competitiveness", while Maersk points to an overall lack of international regulation.

Generally, when stakeholders discuss regulatory issues, they refer to inefficient regulation, or to a lack of regulation. In our interview, Amalie Wang Norus from the Danish Environment Ministry expressed concern with the way ship recycling yards are complying with the regulation by getting Statements of Compliance that are not legally valid. Finally, Jivrajbhai Patel from the SRIA views regulation as an issue due to the uncertainty it causes for the industry, arguing that high taxes in comparison to other ship recycling states hurt Alang's competitive position ("'SRIA honors its commitment of Green Recycling of each and every yard at Alang'" [SRIA] n.d.).

This points to another category: competition. Aside from the SRIA, it was also mentioned by Shree Ram and the GPCB. It is worth noting that these are all of the local stakeholders in Alang that we collected data from on this issue. While the SRIA and GPCB focused on the overall competitiveness of Alang against other shipbreaking states, Donda at Shree Ram emphasized that responsible yards cannot compete against yards that have low standards, who are able to pay more for vessels. He argues that shipowners must be willing to give discounted prices for responsible recycling to help yards like Shree Ram remain competitive. From the shipowner side, Christiansen at

Danish Shipping expressed concern (as mentioned above) that the existence of regional regulation leads to lower competitiveness for the shipowners that are affected by it.

With regards to the triple bottom line, the most commonly mentioned topic was environmental sustainability, which was referenced by nine stakeholders. Christiansen at Danish Shipping stated in our interview that "you have these bad situations with ship recycling in places where we've seen that it's not handled very well, and it's an environmental catastrophe". Overall, the environmental issues associated with ship recycling seem to be top-of-mind for many stakeholders.

Social sustainability was mentioned eight times. Notably, concerns about social issues were mentioned by all three shipowners, with Maersk specifically pointing to the challenge of excessive overtime (Maersk, 2019). The GPCB also mentions OHS concerns and the effect that social and environmental issues in the industry has on local communities (SRIA, 2013). This is also mentioned by the Danish Environment Ministry. Aside from these two comments, social concerns focused on working conditions. Overall, social and environmental matters tended to be mentioned together as key issues, which was particularly evident for the two financiers.

Finally, economic sustainability was mentioned seven times. Most arguments in this area focused on the cost of responsible recycling, as discussed by ClassNK, and that shipowners want to continue doing things in the way that earns them the most money, as mentioned by Grieg Green and the Shipbreaking Platform. Additionally, GMS, Shree Ram, and the Sveinung Oftedal all point to the need for incentives. Oftedal and GMS mention that financial incentives are needed for yards to improve, while Donda from Shree Ram argues that incentives from shipowners would help keep 'green' yards competitive.

We can see based on these responses that, while stakeholders acknowledge the social and environmental issues in the industry, their primary concern is the regulatory framework, and the uncertainty that surrounds it as a result of the delay in ratifying the Hong Kong Convention and the

competitive disadvantages created by national or regional regulation. This is also discussed in section 6.3., which deals with the industry's regulatory framework. Additionally, economic issues are a pressing concern for the shipbreaker group, where a priority seems to be to remain competitive.

6.2.2. Stakeholder definitions of sustainable ship recycling

In answering the question of how the concept of sustainable ship recycling is perceived by stakeholders, we must also consider how these stakeholders define sustainable ship recycling. The majority of data used here is primary, as it was difficult to obtain secondary data for such a specific issue. However, some relevant secondary data could be found for the European Commission and SRIA. In terms of understanding the different views and definitions, we also consider these answers in terms of the triple bottom line. This provided continuity between what stakeholders see as key issues and how they define sustainable ship recycling. Additionally, it could help us identify patterns based on the focus of each stakeholders' definition. The table below presents the key points from stakeholders' answers or statements on this issue.

Stakeholder type	Stakeholder	Key points
Shipowners	DS Norden	The definition needs to include the workers and the community around the facility. Housing for workers, medical facilities, etc. Emphasis on social sustainability.
	DFDS	It should consider workers' health and safety and environmental considerations. It should also incorporate recycling into the ship design. Emphasis on social and environmental sustainability.
Shipowners' associations	Danish Shipping	Sustainable ship recycling means (1) having an IHM, (2) recycling without harm to workers or environment, and (3) circular thinking, reusing parts for new ships. Emphasis on social and environmental sustainability.
Regulators	Danish Ministry of Environment and Food	Compliance with international regulation and EU regulation. A regulatory perspective.
	European Commission	Ship recycling should be carried out "in a way that is good for workers, the environment, and the economy." ("New EU regime for safer and greener ship recycling enters into force," [New EU regime] 2019). Considering the whole triple-bottom line.
Shipbreakers	ISRA	No damage to the environment and no accidents at the ship recycling yards. Emphasis on social and environmental sustainability.
	Shree Ram	Shipowners, recyclers and cash buyers need to work together and take responsibility for recycling. Sustainable ship recycling is following HKC regulation, MEPC guidelines and having an IHM. Regulatory considerations.
	SRIA	View "green ship recycling" as involving economic, environmental, and social issues, considering worker safety and hazardous waste management (SRIA, 2013).

Cash buyer	NKD Maritime	Recycle ecologically responsibly, avoid pollution to the ocean and pay fair wages to workers. Emphasis on the social and environmental side.
NGO	Shipbreaking Platform	Having full containment of all pollutants on the vessel, ensuring safe working conditions and having a high recycling rate for the materials. Consider circularity from the beginning of a ship's life, in the shipbuilding process. Emphasis on social and environmental sustainability.
Consultancy	Grieg Green	Follow guidelines, include IHM on vessels and on-site monitoring. It is not about the location, but about the facility, its management, and processes. Regulatory consideration.
MSI	SRTI	Consider the entire life cycle, cradle to grave. Mostly ecological emphasis.

Table 7: Summary of stakeholders' definitions of sustainable ship recycling. (Secondary data is referenced specifically).

As with the previous section, this data can be viewed from the perspective of the triple-bottom line. Our findings show that out of twelve responses, eight focused on social and environmental sustainability. NKD Maritime stated that it meant to avoid pollution and pay fair wages, while the NGO Shipbreaking Platform took a stronger stance and argued that it should consider full containment of all pollutants and a high recycling rate for materials. Both shipowners focused on workers' health and safety, with DS Norden stating that it should include housing and medical facilities for workers, and further considering the community at large.

Three out of twelve stakeholders mentioned regulation. Regulatory considerations in this case were mostly aimed at ensuring compliance with the HKC or EU-SRR. Norus at the Danish Ministry of Environment and Food said in our interview that a sustainable ship recycling yard "abides by the international standards which the European Union has made", and emphasized that "any facility which is on the European List is doing adequate and green [...] ship recycling". Jemish Donda at

Shree Ram stated that sustainable ship recycling is "to follow HKC regulation, to follow the MEPC guidelines", and that all vessels should carry an IHM. Similarly, Hammerstad at Grieg Green pointed to having an IHM as a key part of sustainable ship recycling, and to following guidelines. He also placed emphasis on oversight, stating that experts and experienced personnel should be present at the yard to inspect and monitor the process on the shipowners' behalf to mitigate risks connected to the recycling process. Additionally, he argued that it is not about the location of the yard, or the ship recycling method, but about the facility itself, the management, and the processes they have in place, and that at the end of the day it is up to the owner to make this decision.

Two stakeholders mentioned all three aspects of sustainability. The SRIA argued that "green ship recycling" requires understanding the interplay between the economic and environmental aspects of ship recycling, as well as considering worker safety (SRIA, 2013). Finally, the European Commission mentioned all workers, the environment, and the economy in their definition ("New EU regime," 2019). It is worth noting that, as it came from a written statement by EU Commissioner for Environment, Karmenu Vella, this was a prepared and pre-vetted definition.

An interesting finding is that, much like in the previous section, a new category emerges from the data: circularity. We found that many of the stakeholders emphasized that sustainability should be considered throughout the lifetime of a ship, all the way from the design phase. This was mentioned by DFDS, the Shipbreaking Platform, and SRTI. Furthermore, Asbjørn Christiansen at Danish Shipping also mentioned circularity, though more in the sense of reusing the steel recovered from scrapped ships to build new ones, closing the loop within the industry (rather than using the materials in other industries as is currently done). This is discussed further in section 7.

What these findings reveal is that, in defining sustainability in the context of the ship recycling industry, most stakeholders emphasize social- and environmental sustainability in their definition. Keeping in mind that these two aspects of the triple-bottom line are of most concern to most

stakeholders in the industry, we move on to the actual regulations to investigate how these elements are represented in the HKC and EU-SRR.

6.3. Codification of sustainable ship recycling into regulation

The second sub-question we aim to answer with this analysis relates to the codification of the sustainable ship recycling concept into regulation. In order to be able to analyze and draw conclusions based on this, we must first consider the areas and issues considered by the regulatory text.

In this regard, it is important to keep in mind that the Hong Kong Convention and the EU Ship Recycling Regulation are very similar pieces of regulation, and are nearly identical on many points, including the Inventory of Hazardous Materials and ship recycling plan (SRP) that must be developed for each ship based on its IHM. In fact, the EU refers to Hong Kong Convention guidelines numerous times throughout its text, and encourages compliance with other (non-binding) relevant ILO and IMO guidelines. However, the EU sets out a stricter control mechanism with the EU List, which prohibits EU-flagged vessels from being recycled at a yard that has not been approved, and sets out guidelines that ship recycling facilities must follow to be approved.

We answer the second sub-question by first reviewing the regulatory text for the Hong Kong Convention and the EU Ship Recycling Regulation and discussing similarities and differences between them, and looking at their focus areas. We then analyze stakeholder statements on the process of drafting these pieces of regulation. This gives us an understanding of both the regulatory text and the process. We then delve into stakeholder views on the Hong Kong Convention and the EU Ship Recycling Regulation, which helps us understand whether they believe their interests are represented by the regulation, and whether they believe that the regulation is sufficient or appropriate in regulating the industry.

6.3.1. Regulatory text

The first point to consider in the regulation is its stated purpose, i.e. what it hopes to accomplish. In its preambulatory clauses, the Hong Kong Convention states:

> The parties to this Convention [...] resolved to effectively address, in a legally-binding instrument, the environmental, occupational health and safety risks related to ship recycling, taking into account the particular characteristics of maritime transport and the need to secure the smooth withdrawal of ships that have reached the end of their operating lives (HKC, 2009, p.1).

The Convention thus takes into consideration environmental protection and workers' health and safety, but aims to consider them within the context of the shipping industry itself and the need to dispose of end-of-life vessels. The EU Ship Recycling Regulation addresses the matter in more concrete terms, stating:

> The purpose of this Regulation is to prevent, reduce, minimize and, to the extent practicable, eliminate accidents, injuries and other adverse effects on human health and the environment caused by ship recycling (EU Ship Recycling Regulation, [EU-SRR] 2013, p.4).

The language used by the Hong Kong Convention is less concrete, aiming to "address" (HKC, 2009, p.1), whereas the EU-SRR aims to "prevent, reduce, minimize and [...] eliminate" (EU-SRR, 2013, p.4). While the EU-SRR specifically points to accidents and injuries as "adverse effects" (EU-SRR, 2013, p.4), the HKC only talks about "occupational health and safety risks" (HKC, 2009, p.1). The EU-SRR further establishes that the Regulation is "aimed at facilitating early ratification of the Hong Kong Convention both within the Union and in third countries by applying proportionate controls to ships and ship recycling facilities on the basis of that Convention" (EU-SRR, 2013, p.2).

When it comes to defining ship recycling as an activity, the two pieces of regulation are nearly identical. The HKC defines ship recycling as:

> The activity of complete or partial dismantling of a ship at a Ship Recycling Facility in order to recover components and materials for reprocessing and re-use, whilst taking care of hazardous

and other materials, and includes associated operations such as storage and treatment of components and materials on site, but not their further processing or disposal in separate facilities (HKC, 2009, p.3).

The EU-SRR adopts the same definition, with two differences: "recover components and materials for reprocessing, for preparation for re-use or for re-use, whilst ensuring the management of hazardous and other materials" (EU-SRR, 2013, p.4). It includes preparation for re-use as a process, and replaces "taking care of" (HKC, 2009, p.3) with "ensuring the management of" (EU-SRR, 2013, p.4), which clarifies that the facility does not have to handle hazardous waste management itself.

On authorizing ship recycling facilities, both regulations set out a number of similar requirements. The key difference is that the EU sets out an audit and control mechanism in the form of the EU List and, as a result, the procedures for yards to gain access to the List, where the Hong Kong Convention depends on the relevant national authorities to approve the yard based on the guidelines set out in the Convention. Additionally, the EU-SRR states that recycling facilities must operate "from built structures" (EU-SRR, 2013, p.11), which has been interpreted to mean that facilities that use the beaching method would not be permitted to join the European List (Argüello Moncayo, 2016).

A final point where the EU fully differentiates itself from the Hong Kong Convention is, once again, related to the European List. Early on, it states that the purpose of the Regulation is:

> also to reduce disparities between operators in the Union, in OECD countries and in relevant third countries in terms of health and safety at the workplace and environmental standards [...]. The competitiveness of safe and environmentally sound recycling and treatment of ships in ship recycling facilities located in a Member State would thereby also be increased. The establishment of a European List of ship recycling facilities [...] would contribute to those objectives (EU-SRR, 2013, p.2).

Here, the regulation makes it clear that there is also an incentive to increase competitiveness of its own ship recycling facilities.

Finally, if we take a look at where the Hong Kong Convention differentiates itself from the EU-SRR, it encourages cooperation between States to meet the Convention requirements when it comes to training and technology. They also encourage Parties "to initiate joint research and development programmes" (HKC, 2009, p.7). The EU-SRR, on the other hand, only mentions cooperation in relation to facilitating "the prevention and detection of potential circumvention and breach of this Regulation" (EU-SRR, 2013, p.15). It therefore fails to encourage or even consider assistance for facilities to meet the requirements set out by the regulation. Aside from these points, the focus and wording of both pieces of regulation is very similar, and mentions of worker safety and the environment are similar throughout.

6.3.2. Stakeholder involvement in regulatory processes

In addition to studying the purpose, wording and differences between the two regulations, we also aimed to understand the process of drafting each piece of regulation, what stakeholder groups were involved, and in what ways. Involvement in the process gives power to the stakeholders and renders them more likely to have their interests represented by the regulation.

We therefore posed the question to interview participants who were familiar with the process, such as Ingvild Jenssen from the NGO Shipbreaking Platform, Amalie Wang Norus from the Danish Environment and Food Ministry, and Sveinung Oftedal of the Norwegian Ministry of the Environment, who had firsthand knowledge of the Hong Kong Convention and EU Ship Recycling Regulation drafting process.

In regards to the Hong Kong Convention, Sveinung Oftedal was one of the key players in writing the draft regulation, as proposed by Norway in 2005 (Puthucherril, 2010). In our interview,

he stated that from the very start of the process (when the issue was first brought up in 1999) the idea was to develop a new, global convention on ship recycling to deal with the industry's problems. However, he stated that while the process got started at the IMO, it was also addressed in other UN bodies through the Basel Convention and the ILO. Nikos Mikelis, who was head of the IMO's ship recycling committee when the Convention was developed, and is now non-executive director at cash buyer GMS, agrees. In an article on ShippingWatch, he states that "the regulations in [the] Hong Kong Convention already take into account a complex interplay with other international conventions by UN bodies such as the Basel Convention and ILO on issues of their competence" (Krigslund, 2018). This indicates that according to both Oftedal and Mikelis, the Hong Kong Convention was not meant to stand on its own, but to complement and work with instruments from other UN bodies.

Oftedal also spoke about participation in the process and discussed the various interests at play in developing a state policy to take to the IMO. He stated that "in a democratic state it is multiple interests involved in developing the policy of a state. What is the most important? Is it environment, business?" He pointed specifically to the large flag states and recycling states as initially being opposed to the Convention, though eventually changing their position. When discussing the negotiation process itself, Oftedal highlighted that there was industry support for regulation from the beginning, but that it needed to be "workable." He also stated that though the recycling states were involved, the industry and industry organizations in these states did not join the process, though their interests were represented in the forum (he does not specify by whom). Furthermore, labor organizations and NGOs were involved. Oftedal points particularly to the NGO Shipbreaking Platform's anti-beaching campaign and states that negotiations made it clear that no state wanted to ban any particular ship recycling method, and that if a beaching ban were to be included in the Convention it would not pass.

Danish Shipping talked about developing a consensus opinion from its members to bring to international discussions. Christiansen stated in our interview that they have a working group on ship recycling where members can ask questions and have discussions. Based on this as well as reports and trips to collect data, they draft their positions, which they bring to the IMO and EU. At the IMO, they participate in working groups and attend IMO discussions as part of the Danish delegation. Additionally, Christiansen mentioned that the overall Danish position at the IMO is presented by the Danish Maritime Authority, which gathers data from the different stakeholders. Overall, it is a collaborative process. At the EU level, he stated that they go through their European partners, indicating that they have a less direct say in these processes.

When asked who had been left out of the IMO regulatory process, Ingvild Jenssen from the NGO Shipbreaking Platform pointed to the recycling industry in Europe and North America, stating that they have not been considered to be key players in the industry. She argued that ship recycling yards in Southeast Asia were represented by their governments and by different industry stakeholders, including cash buyers and the shipping industry itself, "that wants to continue using them".

Jenssen also spoke about the industry after the Hong Kong Convention in 2009, when everyone "was kind of holding their breath" and eventually realized that it would take a long time to ratify. She states that when the EU started working on its own regulation, countries like Greece, Malta and Cyprus wanted it to essentially be identical to the Hong Kong Convention, "introducing also language that the only reason the EU was working on this was to ensure that the Hong Kong Convention would enter into force", while other countries wanted it to tackle some of the weaknesses in the HKC and make it stronger, such as the issue of downstream waste management, third party certification, and elaborating upon labor rights. She said that in the end, these issues were included, and considers the EU-SRR to be a success.

Based on the experiences shared by these stakeholders, we can see from two of the key authors of the Hong Kong Convention that the Convention was never meant to stand alone, but worked based on the interaction with other guidelines and pieces of regulation such as the Basel Convention and ILO guidelines. Additionally, the process of drafting the HKC was generally viewed as collaborative, with participation from labor organizations, NGOs, and industry support. Though the ship recycling industry was not present, both Jenssen and Oftedal agree that their views were well represented by other stakeholders, though Jenssen argues that ship recyclers outside of South Asia have not been included in the process. Pijpers from ISRA also argued that individual countries have significant power in the IMO, as they are the ones bringing their countries' views forward, while Oftedal illustrated the complexity of developing these opinions and deciding whether to prioritize the environment, or business interests.

There is less information on the EU-SRR process, though Ingvild Jenssen pointed to some of the conflict in establishing the purpose of the regulation after the Hong Kong Convention, and whether it would simply be a way to implement the HKC early, which some countries wanted, or whether it would improve upon the Convention and deal with some of its weaknesses. However, we do not have clear information on which stakeholders were or were not involved in this process.

6.3.3. Views on the Hong Kong Convention

By exploring stakeholder views on the Hong Kong Convention, we sought to understand different opinions of the Convention, how stakeholder interests were represented by the regulation, and how stakeholders view the regulation playing out in the industry. The following table shows a simplified overview of stakeholders' views on the Hong Kong Convention.

Positive	Negative
- BIMCO	- Shipbreaking Platform
- Danish Shipping	- SRIA
- Shipowners	
- ISRA	
- Shree Ram	
- NKD Maritime	
- Danish Ministry of Environment and Food	
- Grieg Green	
- GMS	
- IndustriALL	

Table 8: Summary of stakeholders' views on the Hong Kong Convention

The table above shows that the majority of stakeholders view the Hong Kong Convention positively. Of course, the table simplifies the answers significantly by classifying them as positive or negative, and the majority of stakeholders stated both benefits and flaws. Nonetheless, in all cases stakeholders showed an overall positive or negative opinion on the Convention. All in all, shipowners and shipowners' associations were positive toward the regulation, with BIMCO calling it "a big step forward" and arguing that it sets up "a minimum set of regulation, because [...] you don't go for the highest denominator, when it comes to international deals, there will be countries going above it, and there will be countries just following it". Danish Shipping also discussed the importance of ratifying it and having a single global regulation to follow. A desk review of the CSR reports and ship recycling policies of eight Danish shipowners also showed that all but one discuss compliance with the Hong Kong Convention and generally support the regulation (see section 6.4.1.).

The view that BIMCO shares of the HKC as setting minimum acceptable standards for the industry is mentioned by two other stakeholders: Reinoud Pijpers at ISRA and Amalie Wang Norus

at the Danish Environment Ministry. However, Pijpers is also critical of the control mechanisms of the Hong Kong Convention, arguing that it gives too much power to individual states.

When we look at beaching stakeholders and cash buyers, the attitude toward the HKC is generally very positive. Narinder Dheir at NKD Maritime called the Convention a "big step forward" since many yards were obtaining Statements of Compliance and adhering to the regulation (we should also note here that the role and value of these Statements of Compliance is challenged by stakeholders such as the Shipbreaking Platform and the Danish Ministry of Environment and Food). Another cash buyer, GMS, also supports the Convention and encourages shipyard owners to follow it to "mitigate the environmental impact of beaching" (Lin, 2018b). On the workers' side, the workers' union IndustriALL is highly supportive, and engages in lobbying governments to ratify the Convention and accelerate its entry into force (IndustriALL Union, 2018). They argue that it would bring "investment, health and safety training, and more importantly a social dialogue where workers' voices can be heard" ("Bangladesh and India must accelerate ratification of Hong Kong Convention," 2018).

Hammerstad at Grieg Green argued that the HKC is a good convention in many ways. However, there is too much room for interpretation, so the effectiveness of the regulation depends on the facility defining and implementing it. This is one of the issues brought up by Jenssen at the Shipbreaking Platform as well, who is generally very critical of the regulation. She also brings up the lack of requirements for downstream waste management, which she argues makes the regulation weaker than the Basel Convention, the fact that it does not consider labor rights, and the lack of third party certification, which is also discussed by ISRA above.

Additionally, both Shipbreaking Platform and ISRA comment that a weak or corrupt regime has too much power under the Hong Kong Convention, with Jenssen stating "we know that for example in Bangladesh and in India the local authorities have specified that facilities that are

operating as they currently are operating, I mean, they are authorized by often corrupt local authorities [...] so we don't see that the Hong Kong Convention would change anything."

The Shipbreaking Platform, though critical of the HKC, is generally a critical organization whose aim is to push the industry and try to maintain the most responsible practices possible (NGO Shipbreaking Platform, n.d.). Therefore, it is perhaps to be expected that they would be critical in this case, where there are clear weaknesses and social and environmental practices that need fixing in much of the industry.

Finally, the SRIA expressed a negative opinion of foreign regulatory intervention in general, with the President of the SRIA stating that "implementation of HKC 2009 brings unnecessary foreign interventions. We have requested the Government not to ratify HKC-2009" ("SRIA," n.d.) and arguing that national regulation is sufficient to regulate the industry. He further refers to "foreign interference and unilateral conventions such as HKC-2009" ("SRIA," n.d.). In an SRIA newsletter, this view is discussed further, arguing that the Hong Kong Convention functions against the interest of the country, is biased as it does not place obligations on shipowners or shipbuilders, and that domestic regulation is already in place (SRIA, 2013). Though we may point out that this is not factually correct as the Hong Kong Convention sets out the requirement for shipowners such as the Inventory of Hazardous Materials. The important thing in this case is not whether the opinion is based on fact or not, but the stakeholders' opinions of the regulation, in which case we can see that the SRIA does not feel its views are represented by the HKC, and believes that a disproportionate burden is placed on the shipbreakers as opposed to other groups (such as shipowners and shipbuilders).

Overall, we can see that the majority of stakeholders view the Hong Kong Convention in a positive light. However, they are not blind to the weaknesses of the Convention, with several stakeholders agreeing that these are the minimum requirements that IMO members could agree on. Where we see a disconnect is primarily when we look at shipbreaking stakeholders: while Shree Ram,

IndustriALL, and the cash buyers are all very supportive of the Hong Kong Convention, the SRIA, which represents shipbreakers in Alang, views it as unilateral, and an unnecessary foreign intervention in a domestic industry. This leads us to consider what the stake of the SRIA is in the industry: to represent ship recycling yard owners and their interests nationally and internationally. We can thus see how an organization like the SRIA would be opposed to adding a further layer of regulation, when they already feel their industry is disadvantaged by existing national rules.

6.3.4. Views on the EU Ship Recycling Regulation

Similarly to the Hong Kong Convention, we also hoped that studying stakeholders' views on the EU Ship Recycling Regulation would help us understand how their interests are represented by the regulation, different opinions of the EU-SRR, and how stakeholders see the regulation playing out in the industry. The following table shows stakeholder views based on whether they are positive or negative, which we then elaborate upon by discussing some of the main reasons for and against.

Positive	Negative
- DFDS	- Norwegian Ministry of the Environment
- DS Norden	- Shree Ram
- Maersk	- NKD Maritime
- BIMCO	- Shipbreaking Platform
- Danish Shipping	
- Danish Ministry of Environment and Food	
- ISRA	
- Grieg Green	
- Members of RSRS	
- European Union	

Table 9: Summary of stakeholders' views on the EU-SRR.

When comparing views on the EU-SRR to views on the HKC, we can see that opinions are much more divided on this topic. Additionally, they are more nuanced. When we look at BIMCO, for example, they are positive about the EU regulation itself, but are extremely critical of the European List. They criticize that EU yards are not audited before being added to the list, and argue that there should be a clear path for non-EU yards to get on the List to ensure that the regulation is not simply "an act to protect the EU ship recycling market" (Jorgensen, 2019). Finally, they argue that audits should "reward improvements to health, safety and environmental protection" in Southeast Asian yards (Jorgensen, 2019).

Similarly, Christiansen at Danish Shipping argued that they support and plan to comply with the regulation, and he was hopeful about the List being able to improve the standards in the beaching yards by approving the yards that have invested in their facilities. In their 2018 sustainability report, Maersk further states:

> The incentive to get on the EU List is currently encouraging the transformation of Alang seen in the many yards investing in change. We believe the EU can be a real driver for sustaining investment and upgrading in the whole area by including Indian yards that comply with EU regulations in the EU List (Maersk, 2019, p.25).

However, Maersk does not discuss plans to comply with the regulation (Maersk, 2018; 2019). Furthermore, Christiansen cautions that "if none of them are getting on the list, then it will of course completely dissolve again. So we need to have that incentive." Additionally, he spoke about the need for global regulation to avoid a competitive disadvantage for European shipowners.

Oftedal makes a similar argument, stating:

> The EU regulation is useless, there's no meaning. Because the whole problem on a global issue is that you need to have a solution which can ensure that there are no loopholes [...] And the only way to achieve the aim of a framework is to have it global. And then of course, to have it in force.

He also views the EU regulation as detrimental to the ratification of the Hong Kong Convention. BIMCO also points to this issue, stating that very few European states have ratified the Hong Kong Convention and suggesting it may be a matter of "why ratify when you have a regulation already?".

On the shipbreaker side, Jemish Donda from Shree Ram argued that it is very difficult for Indian yards to comply with the regulation, because they need a discount to recycle according to regulation and still make a profit, "and [at the] end of the day we are businessmen." Dheir from NKD Maritime also argued that the standards set by the regulation need to "be in line with what those countries [in the Indian subcontinent] can actually physically do", and that putting Western standards on these countries is not practical, though he agreed that the EU-SRR is "responsible".

Jenssen from Shipbreaking Platform was positive about the EU-SRR, stating that it takes on some of the weaknesses of the Hong Kong Convention in terms of downstream waste management and independent auditing. However, she is concerned about the capacity for implementation when so many shipowners flag out before end of life, specifically pointing to Maersk and stating that they "flagged out their Danish vessels to the registry of Hong Kong to be able to avoid being held accountable under the EU Ship Recycling Regulation". Thus, despite the progress that it represents in comparison to the Hong Kong Convention, the EU-SRR still faces the same challenges in terms of implementation.

Two stakeholders with very positive views of the EU-SRR were Norus at the Danish Ministry of Environment and Food and Pijpers at the ISRA. Norus believes that the European List contains yards that "have a very high quality and a very high level of environmental protection, which we haven't had before." She mentioned that she is in contact with Danish ship recycling yards, which are "very keen to push forward the new European Union law of course, because they hope they'll make their work easier and better." The ISRA, which represents some of these Danish ship recycling yards,

finds the regulation to be more strict than the HKC and with clear requirements so that stakeholders know exactly what they need to do. Like Shipbreaking Platform, Pijpers also praised the third party certification, and argued that the role of individual states is much smaller in the EU-SRR than the Hong Kong Convention, which prevents political involvement.

Finally, though we cannot make a clear judgment on the opinion of the SRIA in regards to the EU-SRR because there are no public statements on the matter, they speak strongly against foreign intervention in relation to the Hong Kong Convention in the previous section, and we can therefore assume that they would have a similar opinion of the EU Regulation.

We see that stakeholders are hopeful about the EU Ship Recycling Regulation and the potential it has to incentivize yards to improve. However, there are significant concerns about the List, both from a capacity standpoint and from the standpoint of restricting access to yards in the Indian subcontinent. Additionally, a few stakeholders mention that flagging out remains a concern.

In regards to the overall effectiveness of regulation, stakeholders agree that regulation is positively affecting the industry, despite only recently coming into force or still being in the process of ratification. NKD Maritime and Shree Ram both find that in the past five to ten years there have been huge improvements in India among shipbreaking yards, with Donda predicting that within five years, all yards in Alang will comply with the Hong Kong Convention. BIMCO and Danish Shipping were both very positive about the potential of the Hong Kong Convention and the effects it has already had in pushing for change. Though stakeholders are aware of and acknowledge the shortcomings of the regulation, as well as the risk of flagging out to avoid it, they are optimistic that regulation can and already is improving conditions in the industry.

6.4. Implementation of sustainable ship recycling by stakeholders

The final part of the research question relates to how the industry has implemented sustainable ship recycling. Here, one of the key areas we wanted to look at was how shipowners have begun dealing with the issue of sustainable ship recycling, which is considered in 6.4.1. We also discuss other stakeholder views on industry initiatives and their value in promoting sustainable ship recycling.

6.4.1. Shipowners' implementation of sustainable ship recycling

When it comes to implementation of sustainable ship recycling in the industry, the primary stakeholder group that we should look at is shipowners. Shipowners, as discussed in the power/interest matrix above, are key industry players with both high power and high interest. We wanted to gather data from a number of Danish shipowners through CSR reports, ship recycling policies, and any other publicly available documents where ship recycling was discussed, with the aim of exploring how different shipowners dealt with the issue of ship recycling publicly, what was discussed, what policies were in place, etc. A summary of findings can be found in table 10 below.

Of the eight shipowners whose CSR reports, policies, and other documents we reviewed, seven discussed the issue of ship recycling. Among these, five discussed it in their 2018 reports and one (Evergas) mentioned it on their website but did not publish a CSR report. TORM referred to ship recycling most recently in 2009 through their CSR report, and very briefly in a 2015 listing prospectus. Monjasa only published a CSR policy and their Head of Compliance stated in an email that they do not have a ship recycling policy (Personal communication, 28 March 2019). Additionally, four shipowners have responsible ship recycling policies in place, with three shipowners developing their own (Maersk, DS Norden and J. Lauritzen), and one (DFDS) adopting the ICS 2009 Guidelines on Transitional Measures for Shipowners Selling Ships for Recycling (ICS, 2009), guidelines referred to a number of times throughout this paper. Poul Woodall from DFDS mentioned their responsible

ship recycling policy during his interview, and forwarded the document once we stated that we could not find it on their website.

Three shipowners mention that they sell their ships long before end-of-life and have a young fleet (DS Norden, 2018; J. Lauritzen, 2016; TORM, 2010). This is supported by the Danish Shipping policy paper on ship recycling, which states that vessels in Denmark are often sold at age 10-15 years (Danish Shipping, 2018). J. Lauritzen stipulates in their policy on responsible ship recycling (drafted in 2016 but reviewed in 2018) that due diligence should be conducted prior to selling a vessel to ensure that the buyer "has no intention of recycling the vessel against our standards" (J. Lauritzen, 2016). DS Norden also outlines guidelines for selling vessels and redelivering chartered vessels near end-of-life in their responsible ship recycling policy (DS Norden, 2018).

In terms of policy compliance, the majority of shipowners reviewed acknowledged the IMO Hong Kong Convention and aimed to comply with it (the only exception here was Monjasa, which does not discuss ship recycling at all). Additionally, four shipowners referred specifically to complying with the EU-SRR. DS Norden stated they would comply with it for EU flagged vessels (DS Norden, 2018), while DFDS and J. Lauritzen both stated they were in the process of preparing IHMs for their vessels, in line with both regulations (DFDS, 2019; J. Lauritzen, 2019). TORM (2010) and Ultranav (2019) both refer to preparing Green Passports for their vessels, which is outdated terminology used to refer to the IHM. Maersk, as discussed in the previous section, refers to the potential of the EU List, but does not discuss plans for complying with the regulation (Maersk, 2019). Finally, both DS Norden (2018) and TORM (2015) refer to complying with the Basel Convention, Maersk (2019) refers to compliance with ILO Conventions, and Ultranav (2019) generally refers to complying with "other applicable regulations" (p.10). TORM (2015) in the context of a listing prospectus, focuses on the financial costs of complying with the regulation and the potential liability of failing to comply.

Some shipowners further align with voluntary initiatives and standards. Maersk (2019) and DS Norden (2019) both discuss their status as founding members of the Ship Recycling Transparency Initiative. Maersk further committed itself to following the UN Guiding Principles on Business and Human Rights in their ship recycling activities, as well as their own ship recycling standards (Maersk, 2019). They are also the only shipowner to embed ship recycling into their sustainability strategy, where one of the key pillars is to "lead change in the ship recycling industry" with the goal of "[driving] transformation and transparency in global ship recycling practices towards a level playing field based on the highest international standards" (Maersk, 2019, p.7). DS Norden (2018) also commits to following OECD standards and UN Global Compact guidelines for business conduct, with the latter also being recognized by J. Lauritzen (2016). Evergas ("Care for Today & Tomorrow", n.d.) also state that yards are audited according to their own HSSEQ (Health, Safety, Security, Environment & Quality) standards.

Finally, four shipowners sold ships for recycling in 2018: Maersk, Monjasa, Evergas (Krigslund, 2019b), and Ultranav (Ultranav, 2019). Ultranav mentions in their CSR report that two vessels were recycled in 2018, both in accordance to HKC standards after an audit of the recycling facilities (Ultranav, 2019). Monjasa sent a vessel to Alang in 2018 (Krigslund, 2019b) which was sold through GMS to Hariyana Ship Demolition in Alang, and which reflagged from Liberia to Comoros prior to recycling (Krigslund, 2019b).The yard has a Hong Kong Convention SOC, and according to the article, Monjasa stated that the sale contract stipulated the ship be recycled in an environmentally-friendly way (translated from "miljøvenlig vis", Krigslund, 2019b). Evergas sent one ship to Shree Ram in 2018 (Krigslund, 2019b), and were highlighted by Jemish Donda from Shree Ram in his interview. Evergas stated that they audited the yard through Lloyd's List prior to sending the vessel, and that a representative of Evergas with authority to stop work was present throughout the process (Krigslund, 2019b). Similarly, Maersk stated that the recycling process

complied with Hong Kong Convention standards, and that a Maersk representative was on site throughout the process with the authority to stop work. The ship reflagged from Singapore to Tuvalu prior to beaching (Krigslund, 2019b).

	Official mention	Compliance	Additional standards	RSRP	Recycled in 2018
DFDS	✓	✓	✓	✓	✗
Evergas	✓	✓	✓	N/A (not available)	✓
Lauritzen	✓	✓	✓	✓	✗
Maersk	✓	✓	✓	✓	✓
Monjasa	✗	-	-	✗	✓
Norden	✓	✓	✓	✓	✗
TORM	✓ (2009, 2015)	✓ (mention economic risk)	✗	N/A	N/A
Ultranav	✓	✓	✗	N/A	✓

Table 10: Summary of Danish shipping company engagement in ship recycling. Developed by authors based on data presented above.

Overall, Danish shipowners have begun implementing sustainable ship recycling through regulatory compliance, discussing their efforts to comply with ship recycling regulation such as the Hong Kong Convention and the EU Ship Recycling Regulation and, in some cases, the Basel Convention. Additionally, some shipowners have begun implementing additional standards such as the UN Global Compact guidelines for business conduct, or developing their own ship recycling policies that go beyond regulatory compliance. The table above provides an overview of the measures

that shipowners have taken in regards to implementing sustainable ship recycling, or even just in discussing ship recycling in relation to their own activities.

An important consideration to make here is that, as discussed previously, a large number of Danish shipowners (discussed in this section) do not engage in recycling activities and maintain a young fleet. This challenges the assumed relevance of this activity to shipowners, though we can see that ship recycling is considered and taken seriously by nearly all of the shipowners reviewed above, as well as by the shipowners' associations interviewed in relation to this thesis. Furthermore, shipowners such as Maersk and DS Norden have also joined multi-stakeholder initiatives to further bring attention to issues in the ship recycling industry, and Maersk has engaged in capacity-building activities and close collaboration with yards in Alang, which is discussed in the following sub-section.

6.4.2. Stakeholders' opinion on industry initiatives

After discussing Danish shipowners' engagement with sustainable ship recycling and implementation of the concept, we also wanted to look at how other stakeholders view industry initiatives such as the SRTI, as mentioned above. There was a divide between stakeholders on this point, with some arguing that shipowners are incentivizing yards to improve through these initiatives, and others stating that efforts to improve Alang in particular are questionable due to the issue of the intertidal zone.

An anonymous stakeholder was positive about industry initiatives, and argued that shipowners were the only group working toward incentivizing yards to improve but that these efforts were not being acknowledged by pressure groups such as environmental NGOs. Christiansen from Danish Shipping also had a positive view of the initiatives, though he expressed concern about maintaining the standards when the shipowners engaging in these initiatives were not present. He thus argued that regulation was needed to make long-term improvements.

This opinion was supported by ISRA, who stated that regulation should be sufficient and questioned efforts to improve yards in Alang due to the issue of the intertidal zone. Similarly, Shipbreaking Platform points to the intertidal zone as the primary problem when it comes to raising the standard of beaching yards.

On the issue of transparency initiatives (i.e. the SRTI), the Shipbreaking Platform referred to them as "just another way for a company to justify wanting to use beaching facilities" and argue that transparency should come from regulators, through e.g. the on-site evaluation reports from DNV-GL for the European Commission. ClassNK, on the other hand, finds that initiatives trying to increase transparency will lead to increased demand for Statements of Compliance for shipyards, as interest in more transparency and more responsible recycling increased. Kunigenas at DS Norden also discussed their role in the SRTI, arguing that it is not about compliance but rather about transparency, about wanting to improve on your own policies, and having a place to openly discuss the issue of ship recycling. She also argues that it brings awareness of the issue to senior management and throughout the company.

6.4.3. Shree Ram's implementation of sustainable ship recycling

Now that we've discussed the shipowners' side, we can also take a look at the shipbreakers through the experience of Shree Ram. Donda discussed the extensive measures they have taken to increase the standards in their yards:

> Since 2015, let me tell you, we started with the impermeable floor, that is concrete floor in the front yard. Then we implemented the drainage system - proper drainage system for the oily blocks, oily machineries and rain water treatment. Then we had the final cutting, which is our backyard, where the third cutting takes place. Even that is impermeable. And we invested in heavy lift cranes. Then we upgraded our standards by giving trainings from third party [sic] to all our workers and our 50 supervisors.

He also emphasizes that all of this effort and investment has been in the hopes of getting on the EU List, and that "we will not give up and we will chase EU. Whatever they tell us, we will try to comply and we'll be in contact with them and giving them a clarification." Finally, he points to the fact that it is important for Shree Ram to be at the forefront of sustainable ship recycling, since they have been pioneers on sustainable ship recycling in Alang since 2006.

Moreover, he discussed how abiding by EU standards has changed the way they do business, stating that the time to recycle a vessel is twice a long (a full year) when it is done according to EU-SRR standards versus what a "black" yard would do, and arguing that this is why they need discounts from shipowners in order to remain competitive. He also states that they currently only work with shipowners that want to recycle to these standards, and that are willing to provide a discount.

Finally, though he believes there are advantages to only recycling vessels responsibly, he is concerned that "if there are no vessels from good owners then we might need to buy vessels from [other] owners who are not willing to recycling their vessel as per the standards [...] But still we'll have to recycle those vessels without any discounts as per the standards which Shree Ram follows". He emphasizes that change and improvements must come from the owners, and that ship recycling is a service which is provided to the owners.

Of course, the case of Shree Ram cannot be applied to other yards in the area, as Shree Ram is viewed by the industry as being at the vanguard in Alang. However, it gives us a good indication of the efforts made on the ground to comply with regulation, and of the challenges that come with wanting to be responsible. Additionally, Donda argued that he has seen significant progress in Alang in the last ten years, with ship recyclers becoming much more aware of issues and trying to meet the standards set by the Hong Kong Convention. He states that within five years, he believes all yards in Alang will be HKC compliant.

7. Discussion

We have now analyzed our data in section 6 in order to answer our three sub-questions. To answer the first sub-question, we looked at the main issues in the ship recycling industry and how stakeholders define sustainable ship recycling. For the second sub-question regarding regulation, we analyzed the text of the HKC and EU-SRR and discussed stakeholders' involvement in the process, and finally analyzed their views on each piece of regulation. Finally, to answer the third sub-question, we looked at how shipowners and shipbreakers have implemented sustainable ship recycling into their activities, and discussed stakeholder views on other industry initiatives.

Though we compared the trends identified throughout section 6 to the power/interest matrix presented in section 6.1., we were not able to identify any significant patterns between stakeholders' views on different issues and the results of the power/interest matrix. This could have been due to the fact that despite being at the same level of power and/or interest, stakeholders across the industry have highly diverse views on issues, and are generally difficult to group together. Additionally, no stakeholder denied the industry's key issues with environmental pollution and poor working conditions, and all were open about the industry's shortcomings and challenges. Where stakeholders' views diverged was in regards to (1) the issues they prioritized, (2) their belief of how these issues should be fixed, and (3) who should be responsible for changing the industry. We discuss these issues further in the four sections below, where we will answer the three sub-questions posed at the beginning of this thesis.

7.1. How do stakeholders in the ship recycling industry perceive the concept of sustainable ship recycling?

Our analysis of sub-question one revealed concern for all three aspects of the triple bottom line (social, environmental, and economic sustainability) in the industry as well as serious concerns

about the effectiveness of regulation. When we consider stakeholder views on the main issues in the ship recycling industry, and what sustainable ship recycling entails, there is significant consideration among stakeholders for social and environmental sustainability, as they discuss working conditions, access to medical facilities, environmental pollution and the effects the recycling process has on local communities, among others. However, there is less consideration for economic sustainability, and the stakeholders who focus on this aspect are those who work in or with beaching yards in Southeast Asia, such as the SRIA and Shree Ram, who discuss the need to remain competitive against other shipbreaking locations and for financial incentives to improve the yards.

While a number of stakeholders focus on the need for incentives to improve the industry, as mentioned above, others take a different view of economic issues in the industry, pointing to shipowners' economic concerns and behavior as an impediment to progress in the industry. Shipbreaking Platform, Grieg Green, and ClassNK all point to the cost of responsible ship recycling as a challenge. Shipbreaking Platform argues that it is far too easy for shipowners to avoid regulation and continue behaving in the way that makes them the most money, while Grieg Green agrees, and points to a lack of global regulation as the reason.

Other stakeholders are primarily concerned with poor social and environmental conditions, though they do not agree on whether the solution should be to improve the beaching yards, or to move away from beaching completely. Ingvild Jenssen from Shipbreaking Platform does not believe that beaching yards can be improved, while Anil Sharma from GMS believes that beaching can be done sustainably, and that the industry is already more sustainable than it gets credit for, since nearly everything on the ships is resold or recycled, and recycling happens locally in supporting industries. Similarly, some stakeholders seem focused on discouraging shipowners from using beaching yards rather than on improving conditions in these yards. This is seen with financiers, and it is also a key criticism of the EU Ship Recycling Regulation, which does not have any mechanism to provide

assistance to countries or yards that want to comply with the regulation. An anonymous stakeholder points out that shipowners are the only group working on capacity building, and on providing an incentive for yards to improve.

Additionally, it seems that regulation is the main concern for most stakeholders. Within this area, there are a number of different opinions which are discussed below in relation to sub-question 2. However, it is an important consideration when looking at different views on the industry.

We can thus answer our first sub-question by stating that stakeholders perceive the concept of sustainable ship recycling in terms of social and environmental sustainability, while economic sustainability is emphasized mainly by stakeholders in the shipbreaker group. However, the majority of stakeholders agree in their concerns regarding the regulatory framework. The delay in ratifying the Hong Kong Convention and the competitive disadvantage created by the national and regional regulation have led to an uncertain regulatory framework that presents a challenge to stakeholders.

7.2. How has the concept of sustainable ship recycling been codified into regulation in the Hong Kong Convention and the EU Ship Recycling Regulation?

To answer the second sub-question, we first analyzed the regulatory texts of the Hong Kong Convention and the EU Ship Recycling Regulation and found that they are very similar, which is to be expected as the EU-SRR was developed using the HKC as a guide. The purpose of both pieces of regulation shows a focus on "adverse effects on human health and the environment caused by ship recycling" (EU-SRR, 2013, p.1), which is in line with the stakeholders' primary concerns in the industry, and in the way they view sustainable ship recycling as discussed above. Though the EU-SRR uses more concrete language, we found the two pieces of regulation to be similar in their focus, and to therefore represent the same stakeholders. Here, we found two key differences: first, the existence of the List, which gives EU yards a competitive boost against beaching yards that are able

to pay more for vessels. Secondly, while the HKC encourages Member States to engage in partnerships to improve conditions in their ship recycling industries, the EU-SRR does no such thing, and generally fails to consider the importance of the beaching yards to their local economies.

When we looked into different stakeholders' experiences with the regulatory process, we found that the HKC was not intended to stand alone, but to work based on its interactions with other agencies' guidelines, and that the drafting process of the HKC was viewed as collaborative, and considered to have involved nearly all stakeholders' interests. Regarding the EU-SRR, there was less information available about that process, so we could not draw conclusions as to stakeholder involvement in that process.

Finally, in regards to the two pieces of regulation, we found that most stakeholders view the Hong Kong Convention positively, though they are aware of its flaws. Opinions on the EU Ship Recycling Regulation were also primarily positive, though there was significant criticism of the European List in regards to capacity and access to yards in the Indian subcontinent. Overall, we found that stakeholders are positive about existing regulation and its effects on the industry, though there is still significant concern about the problem of flagging out.

We have now discussed the two key pieces of regulation in the ship recycling industry, in terms of the text, the regulatory process, and stakeholder views on each piece of regulation. Sub-question one showed that regulation is a key concern of most stakeholders, but sub-question two shows that overall perceptions of the regulation is positive, and that stakeholders are generally hopeful about the potential of regulation to transform the industry. Additionally, stakeholders place the most emphasis on social and environmental sustainability when defining sustainable ship recycling, which is consistent with the purpose of both pieces of regulation. However, neither regulation truly considers the economic sustainability and competitiveness that shipbreakers are concerned about.

7.3. How has the industry implemented the concept of sustainable ship recycling?

In order to answer sub-question three, we reviewed the CSR and sustainability reports for eight Danish shipowners to investigate how and to what extent they had incorporated sustainable ship recycling into their activities. Aside from this, we also wanted to speak to industry experts who might be aware of trends among shipowners and who might be able to shed some light on how different shipowners view sustainable ship recycling. Aron Sørensen from BIMCO stated that shipowners generally take these issues seriously, and recognized that recycling should be done responsibly. He argued that shipowners differ in their approach to sustainability not necessarily due to the shipping segment they are in, but rather the company's profile, which links back to the discussion of sustainable shipping and CSR in section 2. However, he acknowledged that some BIMCO members needed the money from the sale of a scrap vessel to purchase a new one, and in that case they would "want to get the most out of it".

Among the Danish shipowners, we found that the majority officially mentions ship recycling and discuss actions in that field, indicating that it is an issue of note to most shipowners. Additionally, some shipowners had their own responsible ship recycling policies, as well as guidelines for recycling based on compliance with regulation and, in some cases, voluntary initiatives and standards. We found that overall, Danish shipowners are concerned with and give importance to sustainability in ship recycling, and to regulatory compliance, as all but one of the shipowners reviewed mentioned compliance with the Hong Kong Convention, and half of the shipowners mentioned compliance with the EU Ship Recycling Regulation.

We also found that a large number of Danish shipowners keep young fleets and therefore do not engage in recycling activities. However, of the three Danish shipowners that sent vessels to Alang in 2018, we found that two (Evergas and Maersk) applied responsible ship recycling standards and had staff on site throughout the recycling process to ensure that the standards were kept. Furthermore,

the Evergas vessel was recycled at Shree Ram, which also detailed its efforts and investment to improve facilities to comply with EU regulation. This gives us an indication that shipowners are willing to put these policies and discussions into practice.

On the shipbreaker side, we also looked at Shree Ram's implementation of sustainable ship recycling, where they emphasized their commitment to gaining access to the European List, and detailed all of the improvements to their facilities, from impermeable floors, to third-party trainings for yard workers and managers. Additionally, both Jemish Donda from Shree Ram and Narinder Dheir from NKD Maritime were optimistic about the possibility of Shree Ram gaining access to the EU List.

To answer sub-question three, we find that shipowners have generally taken seriously the task of implementing sustainable ship recycling principles, engaging with the issue even if they do not see the immediate need to recycle ships, as they keep a young fleet. We also found that in two out of three cases where ships were beached in 2018, this was done with consideration for responsible ship recycling principles, after vetting the yard and ensuring that standards were met through having personnel on the ground throughout the process. On the yard side, we can also see that Shree Ram has put considerable effort into improving conditions, though this is of course the case of one yard and cannot be generalized to the rest of the industry.

7.4. Further topics of discussion

During our interviews, a number of topics came up that were not directly related to our research question, but that we consider important to bring to the surface since these topics deal with the core of the industry's problems as well as viable solutions.

The first topic is the question of where responsibility should be allocated, that is to say where does responsibility for ethical behavior lie in this industry. According to our power/interest matrix,

developed in section 6, the two key players in the industry are regulators and shipowners. These are stakeholders with both high power and high interest, who have both the ability to bring about change in the industry, and the interest to do so. It can therefore be argued that responsibility to improve the industry lies with these stakeholders. They should ensure sustainability and ethical standards in the ship recycling process. Jemish Donda at Shree Ram argued in our interview that sustainable ship recycling has to start with shipowners taking responsibility and that it requires shipowners, recyclers and cash buyers to work together. However, IndustriALL emphasizes the role that large shipbreaking nations like India and Bangladesh play to "achieving a sustainable future in the shipbreaking industry" ("Bangladesh and India must accelerate ratification of Hong Kong Convention," n.d.). This is similar to points made by DFDS, BIMCO, and Grieg Green, all of whom point out that support from the recycling states is needed for the Hong Kong Convention to enter into force.

Some respondents also had suggestions for how to solve issues in the industry. Donda suggested that shipowners should grant discounts to recycling yards with responsible ship recycling standards. According to Donda, having to compete with low standard yards that can pay more for vessels is difficult and shipowners are not stepping up to show responsibility in this area. He suggested that if shipowners were to give yards discounts on vessels that were recycled responsibly and according to HKC regulation, that would give yards the incentive to improve. On a similar note, Ingvild Jenssen at the Shipbreaking Platform and Poul Woodall at DFDS both suggested a refund scheme, where shipowners would pay into a fund either upon delivery of the ship or during the ship's operational life, and the money would be returned to the last owner if they recycle the ship at an approved facility.

Another common topic discussed by stakeholders was the idea of circularity in the shipbuilding process. Woodall and Jenssen both mentioned the need for a cradle-to-cradle mentality in shipbuilding, arguing that recycling should be "built in" at the design phase. This is echoed by

Nicole Rencoret at the SRTI, who argued that the whole process of shipbuilding and operation should be about prolonging the life of the vessel, and recycling as much as possible at the end-of-life stage. Christiansen at Danish Shipping also suggests using materials recovered from scrap ships for new vessels, rather than in different industries as is currently done today. This would be a way to close the material loop in the shipping industry, though it is worth noting the dependence that e.g. Bangladesh has on scrap steel from the ship recycling industry. Finally, the SRIA believes that rather than placing so many obligations on shipbreakers, the Hong Kong Convention could also place more obligations on shipbuilders, indicating a belief that ships could be built for better recycling.

8. Conclusion

This thesis aimed to fill a gap in the literature with regards to taking a stakeholder perspective in the ship recycling industry. Though much literature exists discussing the social and environmental hazards associated with ship recycling, and particularly the practice of beaching used in Southeast Asia, we were unable to find literature that considered different industry players and their perspectives on (1) what sustainable ship recycling is, (2) the emerging regulatory framework in the industry, and (3) the implementation of sustainable ship recycling in their activities.

Through primary and secondary data collection, we aimed to answer the overall research question: *How is the concept of sustainable ship recycling perceived by different stakeholders, and how has it been codified into regulation, and implemented by the ship recycling industry?*

In order to do this in the most effective way, we broke the research question down into three sub-questions, which helped structure our data collection and analysis process. In the discussion in section 7 we then connected the dots, and provided answers to these three sub-questions.

In regards to sub-question one, which looked at how different stakeholders define sustainable ship recycling, we found that the main emphasis in stakeholders perception of sustainable ship recycling is on social and environmental sustainability. Economic sustainability was mainly emphasized by shipbreakers. We also found that most stakeholders are concerned with regulation, the delay in ratifying the HKC and a competitive disadvantage created by regulation, leading to an uncertain regulatory framework.

Sub-question two looked at the regulatory framework emerging in the industry, and evaluated both the regulation itself and the regulatory process, as well as how different stakeholders viewed the two key pieces of regulation, the Hong Kong Convention and the EU Ship Recycling Regulation. We found that though the previous question showed concern with regulation, overall stakeholders do perceive regulation positively. In our findings they believed existing regulation to have good potential

to positively transform the industry. In the previous question we confirmed that stakeholders are most concerned with social and environmental sustainability in the industry, which is consistent with the purpose of both the HKC and the EU-SRR. However, neither regulation truly considers the economic sustainability and competitiveness that shipbreakers are concerned about.

Finally, sub-question three examined implementation of sustainable ship recycling among stakeholders. This was mainly relevant to shipowners and shipbreakers, and through the discussion, we found that among the shipowners considered in the research, sustainable ship recycling is a topic that has been taken seriously and implemented in most cases. Danish shipowners engage seriously with the issue, whether they recycle ships or not. Those that had recycled, did so with sustainability principles in mind and took care to ensure standards were met. In the case of Shree Ram, which was the shipyard we could find information on, they had put considerable effort into improving conditions.

Having now answered the three components of our primary research question, we can bring it all together and provide a final answer. We find that the concept of sustainable ship recycling is perceived by stakeholders to include social and environmental sustainability, which has likewise been codified into regulation by the EU-SRR and the HKC. Furthermore, according to our analysis and based on our stakeholders, sustainable ship recycling seems to have been implemented by shipowners and shipbreakers alike.

Through our research, we have provided an overview and mapped out the stakeholders in the ship recycling industry in a comprehensive way. We hope that this paper has emphasized the need for stakeholder consideration and inclusion, particularly when dealing with regulating an industry that was referred to by an interviewee as "a bit of a cowboy industry." With so many players spread out all around the globe, and so little transparency and communication between them, it is not surprising that they have different views and perspectives of the industry, even when they agree on its basic issues. Additionally, there is a lack of clarity among stakeholders about what rules and

processes they need to follow when recycling a ship, due to the number of guidelines and regulations issued by different agencies at national, international and supranational levels, which provides opportunities for new stakeholders to step in and fill those knowledge gaps, as we have seen with e.g. the green ship recycling consultancies.

8.1 Recommendations for further research

We should note that due to the case study methodology adopted by this paper, as well as the delimitations outlined in the introduction, our findings cannot be generalized for the entire industry. However, the findings from this paper do give us an indication of stakeholder priorities and concerns that should be explored in further research.

One of the issues discussed several times throughout this paper was the difficulty we had in gaining access to stakeholders on the shipbreaking side, such as yard owners, local regulators, and workers. Though we were able to find some secondary data to fill this gap, the inability to clarify or confirm knowledge with the stakeholders themselves led to lower data quality in this regard. One example is in regards to opinions of the Hong Kong Convention, where the Shipbreaking Platform argued it lacked consideration of labor rights, while IndustriALL argued the Convention would be extremely beneficial to shipbreaking workers. Here, further discussion and clarification would have been helpful in gaining a better understanding of these stakeholders, and how or if they saw workers being represented by the regulation. Therefore, further research should aim to collect primary data from these stakeholder groups whose voices are rarely heard firsthand, but who are often affected the most by changes in the industry.

Additionally, we identified several issues of interest that were discussed in section 7, and that should be considered in future research. The first of these was responsibility, where the matter of who should be responsible for improving the industry and behaving ethically was discussed. This is a key

issue in the industry, establishing responsibility and accountability, as well as clear guidelines for appropriate action and behavior. While some stakeholders argue it should be regulators who set these rules, others believe shipowners must be the ones to drive change from the market side, while at the same time, some feel that cash buyers enable poor conditions in the industry by continuing to sell to subpar yards for the most money. This is an important topic to be explored in future research.

Another topic that was mentioned by several stakeholders but has not been dealt with by literature is that of circularity in ship design, and building for recycling. Further discussion and research into the potential of this area could help tackle some of the environmental and safety hazards associated with ship recycling, and increase the industry's efficiency moving forward. Finally, we discuss some of the stakeholders' proposed solutions, such as discounts for responsible shipyards and financial incentive schemes for shipowners. We believe that further research in these areas can bring us closer to developing viable solutions to the industry's problems, though we emphasize the need for future research to consider all industry stakeholders and their perspectives and concerns.

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Appendices

Appendix I: General interview guide

General:
1. Can you tell us a bit about your role and your background?
2. Can you tell us a bit more about your organization and how it relates to ship recycling? // the role you play in the industry?
    a. Who do you represent // advocate for? How?

SSR Definition:
3. What do you see as the main issues in the ship recycling industry? Why?
4. How would you define sustainable ship recycling? // What does sustainable ship recycling look like?
5. How does your organization work with the topic sustainable ship recycling?
    a. How big of a priority is it compared to other sustainability/CSR/compliance activities?

Expert opinion:
6. Have you noticed increased demand for sustainable ship recycling from shipowners?
7. Where does the push for ship recycling come from?
8. Do you see a difference in attitudes (toward SSR) depending on the segment or country shipping companies work in?

Regulation:
9. What is your opinion on the Hong Kong Convention?
10. What is your opinion on the EU Ship Recycling Regulation?
11. Was your organization involved in the drafting of these two pieces of regulation?
    a. What did the process look like? Who is represented?
    b. How does your organization get involved in regulatory discussions?
12. Do you think existing regulation is effective in controlling and improving the industry? Why/why not? // Is current regulation enough to solve the industry's problems?
    a. Does it reflect the needs of all stakeholders? // Do you believe your interests are represented?

Implementation:
13. What do you think about industry initiatives like the Ship Recycling Transparency Initiative (SRTI), or Maersk's current work with capacity building in Alang?
14. Can you walk us through the steps you've taken to actually implement these pieces of regulation?
    a. Have you faced challenges in terms of implementation?

Appendix II: Interview request template

Elizabeth Petit
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DK-2300 København S, Denmark
+45 60550112
elpe15ac@student.cbs.dk

Attn: Contact person (if there is one)
Organization name
Address

Date

Dear [name],

We are reaching out to you with an interview request in relation to our master's thesis. We are two students at Copenhagen Business School researching the shipbreaking industry, and input from [organization] would be extremely valuable to our research.

Our project focuses on the concept of sustainable ship recycling and what it means to the different stakeholder groups involved in the industry. We want to use the interview data to identify stakeholder clusters with similar perceptions, and to gain a better understanding of the value chain. We will also investigate the appropriateness of regulation (i.e. the Hong Kong Convention and EU Ship Recycling Regulation) and other steps toward sustainable ship recycling in addressing the industry's key problems from different stakeholder perspectives.

Our interview will primarily focus on your role in the shipbreaking industry, as well as the way sustainable ship recycling is defined and understood in your organization. Additionally, we would like to understand how it compares to other priorities, as well as your view of industry regulation like the Hong Kong Convention and EU Ship Recycling Regulation.

We estimate that the interview will take approximately 45 minutes. We would ask your permission to record the interview, to facilitate the data collection for us. As mentioned in the email, the interview could be conducted at your convenience in person, by phone, or by Skype. Confidentiality and anonymity can be arranged if preferred, and we can provide a briefing summarizing our findings after the project is finished.

We thank you in advance for considering this, and we look forward to hearing from you.

Kind regards,
Elizabeth Petit and Thordis Alda Thordardottir