Marine Transportation Research Brief

SASB’s Industry Brief provides evidence for the material sustainability issues in the Marine Transportation industry. The brief opens with a summary of the industry, including relevant legislative and regulatory trends and sustainability risks and opportunities. Following this, evidence for each material sustainability issue (in the categories of Environment, Social Capital, Human Capital, Business Model and Innovation, and Leadership and Governance) is presented. SASB’s Industry Brief can be used to understand the data underlying SASB Sustainability Accounting Standards. For accounting metrics and disclosure guidance, please see SASB’s Sustainability Accounting Standards. For information about the legal basis for SASB and SASB’s standards development process, please see the Conceptual Framework.

SASB identifies the minimum set of sustainability issues likely to be material for companies within a given industry. However, the final determination of materiality is the onus of the company.

Related Documents

- Marine Transportation Sustainability Accounting Standards
- Industry Working Group Participants
- SASB Conceptual Framework

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INTRODUCTION

Ships have played a vital role in exploration and trade and are the oldest means of long distance travel. They are one of the cornerstones of a modern globalized economy. Trade has evolved to a point where no country is self-sustaining, and the shipping industry enables cost-effective carriage of bulk and containerized goods. Ships transport everything from grains and fuel to automobiles. In fact, more than 90 percent of international trade is carried via ships. As one of the most efficient modes of transportation, shipping will continue to drive economic activity, and the size of the industry is expected to grow with the world economy.

Much like other modes of transportation, modern ships rely on fossil fuels. Despite its efficiency, shipping generates significant emissions and can have an impact on marine life. By its nature, shipping is one of the most international industries. As such, it faces inherent risks of operating in countries with high-levels of corruption. Operating on the high seas also brings safety concerns, and accidents can be costly in terms of the environment, human life, and property.

Management (or mismanagement) of material sustainability issues, therefore, has the potential to affect company valuation through impacts on profits, assets, liabilities, and cost of capital.

Investors would obtain a more holistic and comparable view of performance with Marine Transportation companies reporting metrics on the material sustainability risks and opportunities that could affect value in the near- and long-term in their regulatory filings. This would include both positive and negative externalities, and the non-financial forms of capital that the industry relies on for value creation.

Specifically, performance on the following sustainability issues will drive competitiveness within the Marine Transportation industry:

- Global regulation limiting greenhouse gases and air pollutants, which is driving adoption of more fuel-efficient, cleaner-burning engines and fuel;
- Safety regulations that address ecological impacts from marine operations, which can lead to costly remediation and penalties;
- Corruption at ports where facilitation payments are seen as a necessary aspect of shipping, an important business ethics issue;
- Strong accident and safety protocols, which are paramount in reducing costly environmental pollution, human casualties, and cargo damage. Employee safety is a growing concern, as companies worldwide are increasingly held accountable for workers’ health and safety.

INDUSTRY SUMMARY

The Marine Transportation industry consists of companies that provide deep-sea, coastal, and riverway freight shipping services. Key activities include transportation of containerized and bulk freight, including consumer goods and a wide range of
The vast majority of global-shipping freight is carried by companies based outside of the U.S. Due to the international scope of the industry, companies operate in many countries with diverse legal and regulatory frameworks.

In 2013, roughly 9.6 billion tons of cargo were shipped via sea. The primary vessel categories are tankers, dry bulk, and containers. Tankers transport chemicals, oil, and refined petroleum products. Dry bulk represents the largest subsector by tonnage (approximately 53 percent of the market), as it includes high-volume commodities such as coal and iron ore. The container segment moves most consumer goods and represents the highest value.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.} Intermodal freight—where containers are used to shift goods between different modes of transport—has been a key facilitator of international trade growth. The model, which uses standardized containers, leads to faster loading times, point-to-point distribution, and greater fuel efficiency. Port infrastructure loads containers directly onto vessels and ground transportation, including trucks and trains.

Globally, publicly traded marine shipping companies generate about $270 billion in revenue, with U.S.-listed companies generating $117 billion.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.} The overall level of market concentration is low.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.} Denmark-based Maersk Lines is an industry leader, with only 7.5 percent of the global deep-sea, coastal and inland water transportation market; other firms have formed alliances to achieve better economies of scale and compete with Maersk.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.}

Profit margins, which correlate strongly with freight rates and fuel prices, tend to be volatile and low. For companies traded on U.S. exchanges, as well as those primarily traded over-the-counter (OTC), median net income margin was 2.4 percent for the fiscal year 2013.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.} The industry is also extremely capital intensive, making the barrier to entry high. For example, in 2011 Maersk ordered 20 new “Triple E Class” ships, which are the largest in history and cost $190 million each. The container segment suffers from insufficient financing, with new ships financed nearly 100 percent by debt. Companies struggle to service debt when freight rates fall or fuel prices rise substantially.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.}

Services are typically conducted under contracts that last between one and five years, with some options for renewal. Term contracts feature either set or daily rates for the transport of cargo from origin to destination. Unlike spot contracts, time charters, or term contracts with a daily rate, insulate companies from risks associated with weather and navigational delays and temporary market declines. Meanwhile, spot contracts have a rate that is determined at the time of shipment. Since these are based on market rates, they are subject to market volatility.\footnote{Industry composition is based on the mapping of the Sustainable Industry Classification System (SICS™) to the Bloomberg Industry Classification System (BICS). A list of representative companies appears in Appendix I.} Customers of Marine Transportation companies include logistics and freight forwarding companies, as well as producers of coal, metal ore, steels, automobiles, consumer goods, etc. Major ports depend on the type of good. For tankers, most of the shipping originates from the Arabian Gulf and goes to U.S. Gulf, China, Japan, Singapore, and Europe. Much of the growth in dry bulk shipping is driven by demand from China and other emerging
economies. China and the U.S. are the top importers and exporters of containerized cargo.

Industry revenues are closely correlated with industrial output and demand for consumer goods. Individual company performance is largely driven by tonnage, container rates, and fuel prices. (The fuel, called “bunker” in the industry, is a heavy form of diesel.) Fuel is the industry’s largest cost component, accounting for 20 to 30 percent of revenue, while labor represents nearly 20 percent. In some parts of the world, notably Asia, shipping conferences set nonbinding guidelines for container rates. Such conferences were banned in Europe, after the industry’s exemption to competition rules was eliminated.

During the 2007-2009 recession, revenues declined sharply as demand for consumer products and commodities plunged. The Ports of Long Beach and Los Angeles, which are the two busiest U.S. container ports, reported 30 to 40 percent declines in container volumes. Shipping rates cratered; the Baltic Dry Index, which measures average spot-shipping rates for a wide range of commodities and ship sizes, plunged 94 percent between May and December 2008. The dramatic rate drop came after a long period of rising prices during which there was an undersupply of vessels and high commodity demand in developing nations.

In 2006, the industry began a two-year ordering spree of new, large vessels as the surge in East Asian demand showed no signs of abating. By the time the recession began in late 2007, new vessels were being delivered into a market that had no use for them. The resulting oversupply exacerbated the collapse in rates caused by economic conditions. While shipping volumes have recovered substantially since the recession, rates remain low due to a continued oversupply of ships. Over the next few years, the industry expects steady, slow global growth, in part due to low expected growth in global GDP.

LEGISLATIVE AND REGULATORY TRENDS IN THE MARINE TRANSPORTATION INDUSTRY

The following section provides a brief summary of key regulations and legislative efforts related to this industry.

In the U.S., the Marine Transportation industry is subject to regulatory oversight at the federal, state, and local levels. The industry is subject to environmental regulations on issues including air emissions, waste management, and water discharge, including the Clean Air Act and the Clean Water Act, which prevent unpermitted discharge of pollutants in U.S. coastal and inland waterways and ports. Pollution at ports is of particular concern due to the proximity to human populations. Under the Jones Act of 1920, waterborne trade between U.S. ports must be carried out by vessels flying U.S. flags, manned and owned primarily by U.S. citizens, and built in the U.S.
Marine transport between the U.S. and foreign nations is subject to the Shipping Act of 1984 under the Federal Maritime Commission, the Oil Pollution Act of 1990, the Comprehensive Environmental Response Compensation & Liability Act of 1980, the Rivers and Harbors Act of 1899, and the Invasive Species Act. Additionally, a number of international regulatory bodies maintain jurisdiction over international waters. The International Maritime Organization (IMO), a United Nations agency of 170 member states, is responsible for environmental pollution prevention and the safety and security of worldwide shipping. A product of the IMO, the International Convention for the Prevention of Pollution from Ships (MARPOL) lays out rules for prevention of operational and accidental discharges of oil, waste, and other pollutants. The U.S. Act to Prevent Pollution from Ships requires the U.S. to enforce MARPOL’s guidelines. Similarly, the Safety of Life at Sea Convention (SOLAS) details security requirements for ports, shipping companies, and governments to tackle issues such as piracy and crew safety. The International Management Code for the Safe Operation of Ships and for Pollution Prevention is an international standard under SOLAS that ensures safety of life at sea and sets rules for environmental protection. Ships can be registered under flags of a state different from the owner’s country of domicile. Because of this, ships must comply with not only international regulations and regulations of the ports where they operate, but also those of their flag states.

Emissions of greenhouse gases (GHGs), including carbon dioxide (CO₂) and nitrous oxide (N₂O), are of particular concern to regulators and the industry, given high levels of emissions. In general, environmental protection regulations are becoming more stringent, placing the Marine Transportation industry at risk of higher compliance costs in domestic and international markets. For example, MARPOL Annex VI included progressive reduction in emissions of sulfur oxides, nitrogen oxides, and particulate matter.

Industry initiatives like the Clean Cargo Working Group enable shippers and their customers to measure, evaluate, and report on the environmental impacts of shipping. The World Shipping Council is another association of container shipping companies that assists members to address various industry issues including environment, security, and safety. Its members represent about 90 percent of global liner vessels.

U.S.-based shipping companies must adhere to the Foreign Corrupt Practices Act (FCPA) of 1977, which makes it unlawful to pay foreign government officials to assist in obtaining or retaining business. Companies must also comply with the U.K. Bribery Act of 2010 and other applicable anti-corruption statutes. These laws are relevant to the shipping industry because of its exposure to multiple national jurisdictions with facilitation payment and corruption regulations. Companies are proactive about addressing bribery concerns. The Maritime Anti-Corruption Network (MACN) is an industry association that promotes good corporate practice for reducing corruption in the industry.
Industry drivers and recent regulations suggest that traditional value drivers will continue to impact financial performance. However, intangible assets such as social, human, and environmental capitals, company leadership and governance, and the company’s ability to innovate to address these issues are likely to increasingly contribute to financial and business value.

Broad industry trends and characteristics are driving the importance of sustainability performance in the Marine Transportation industry:

- **Environmental externalities and regulatory response**: The industry’s operations create environmental externalities, including GHG emissions and impacts on biodiversity. Global regulations are focusing on addressing these externalities as environmental concerns increase, creating risks for industry players and incentivizing them to mitigate these impacts.

- **Safety management to maintain license to operate**: Accidents in the Marine Transportation industry can lead to high social and environmental costs by affecting lives, the environment, property, and goods. At the same time, such events put the efficiency of marine operations at risk, with potentially significant costs for companies. Rising marine traffic and climate change contribute to more hazardous conditions at sea and at ports, heightening the importance of accident prevention and response.

As described above, the regulatory and legislative environment surrounding the Marine Transportation industry emphasizes the importance of sustainability management and performance. Specifically, recent trends suggest a regulatory emphasis on environmental protection and crew safety, which will serve to align the interests of society with those of investors.

The following section provides a brief description of each sustainability issue that is likely to have material implications for companies in the Marine Transportation industry. This includes an explanation of how the issue could impact valuation and evidence of actual financial impact. Further information on the nature of the value impact, based on SASB’s research and analysis, is provided in Appendix IIA and IIB. Appendix IIA also provides a summary of the evidence of investor interest in the issues. This is based on a systematic analysis of companies’ 10-K and 20-F filings, shareholder resolutions, and other public documents. It is also based on the results of consultation with experts participating in an industry-working group convened by SASB.

A summary of the recommended disclosure framework and accounting metrics appears in Appendix III. The complete SASB standards for the industry, including technical protocols, can be downloaded from www.sasb.org. Finally, Appendix IV provides an analysis of the quality of current...
disclosure on these issues in SEC filings by the leading companies in the industry.

ENVIRONMENT

The environmental dimension of sustainability includes corporate impacts on the environment. This could be through the use of natural resources as inputs to the factors of production (e.g., water, minerals, ecosystems, and biodiversity) or environmental externalities and harmful releases in the environment, such as air and water pollution, waste disposal, and GHG emissions.

The Marine Transportation industry faces risk related to environmental factors. One of the industry's greatest sustainability challenges comes from the regulation of GHG and other air pollutants from shipping operations. These regulations can affect fuel costs by requiring use of cleaner-burning, more expensive fuel, and may require extensive capital investments to upgrade equipment. Other environmental externalities include ecological impacts as they pertain to waste disposal, accidental releases, introduction of invasive species, and impact on marine wildlife.

Environmental Footprint of Fuel Use

Marine Transportation companies generate emissions mainly from the combustion of diesel in ship engines. The industry's reliance on heavy bunker fuel is of material concern due to intensifying GHG regulations and rising fuel costs. Recent environmental regulations are driving adoption of more fuel-efficient engines and use of cleaner burning fuels. Furthermore, fuel constitutes a major expense for industry players, providing a further incentive for fuel efficiency.

Greenhouse gases and air pollutants including carbon dioxide (CO₂), nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM) are the main environmental externalities of fuel use for marine shipping companies. On a relative basis, the industry is the most fuel efficient of the major transportation modes in terms of fuel use per ton shipped. However, due to the size of the industry, its contribution to the global GHG inventory is still significant. Additionally, ship engines and port infrastructure can emit several types of air pollutants regulated under the Clean Air Act, including hazardous air pollutants, criteria air pollutants, and volatile organic compounds. These pollutants tend to have more localized environmental and health impacts, and are thus a concern at port cities. HAPs such as benzene are known human carcinogens, NOx and VOCs contribute to the formation of ground level ozone, and PM are associated with health effects such as premature mortality for adults and infants, heart attacks, asthma, and lost work days.

Emissions are directly related to the total fuel consumed, the type of fuel, and other factors such as engine type. Improving fleet fuel efficiency through purchase of new ships or retrofits can improve performance in this area. Regulatory compliance costs, both in terms of capital
investment and operating costs, can be significant. Proper management of this issue may result in fuel cost savings, and can contribute to lowering regulatory risks and penalties.

Additionally, use of fuels that generate fewer emissions could also affect performance. The use of biofuels is also limited, in part due to a lack of a universal standard for biodiesel. However, regulations on emissions reductions could result in the inclusion of biofuels into the common fuel distribution system. Biofuels may seem attractive in terms of emission intensity, however they have wider social and environmental implications (for example, production ethanol from corn not only competes with food resources but is also extremely water intensive during crop production phase.) Some operators are piloting the use of solar energy to provide part of the electricity needs on board. Company performance in this area can be analyzed internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Gross global Scope 1 emissions;
- Discussion of strategies to reduce emissions, and performance against those targets;
- Energy consumed, percentage from heavy fuel oil and percentage from renewables;
- Emissions of NOx, SOx, and PM; and
- Energy Efficiency Design Index for new ships.

Evidence

Marine Transportation is one of the most fuel-efficient modes of transport. However, the industry’s contribution to GHGs and air pollution is notable. As a result, regulatory efforts have focused on mitigating environmental externalities, with direct impacts on company value. Shipping generates about three percent of global GHG emissions, doubling in absolute terms between 1990 and 2007. The industry also contributes five to eight percent of SOx emissions, and 15 percent of NOx emissions.

The industry’s share of global emissions is projected to increase. If shipping needs continue to grow without significant improvements in vessel fuel efficiency, research conducted in 2013 projects that Marine Transportation will produce six percent of global GHG emissions by 2020 and 15 percent by 2050. This is in line with other estimates. A 2009 IMO study concluded that in the absence of new policies, mid-range estimates for 2050 CO2 emissions from international shipping would be two to three times 2007 levels.

There are several regulations driving emissions reduction in the shipping industry. In June 2013, the European Commission proposed mandating “monitoring, reporting and verification of CO2 emissions from large ships using EU ports.” In 1997, IMO introduced a MARPOL annex called Regulations for the Prevention of Air Pollution from Ships (Annex VI), the aim of which was to reduce airborne emissions including NOx, SOx, PMs, and VOCs. Annex VI contains a program that applies increasingly stringent emission standards and fuel sulfur limits to ships that operate in Emission Control Areas. An amendment to the annex aimed at reducing GHG emissions went into effect January 1, 2013. It includes a set of efficiency indexes, including the Energy Efficiency Design Index, which details minimum energy-efficiency requirements for
ships built after 2013. The non-prescriptive measure requires progressive efficiency gains of 10 to 30 percent between the years 2013 and 2030 in terms of CO₂ per capacity-mile. The EPA and U.S. Coast Guard agreed to jointly enforce MARPOL guidelines in U.S. territorial waters through the designation of Emission Control Areas (ECAs). Both U.S. flagged vessels and non-U.S. flagged vessels may be liable for a civil penalty of up to $25,000 for each day of violation.

Current U.S. regulations surrounding GHG emissions and fuel standards are driving an increase in capital investment in the marine shipping industry, including switching to cleaner fuels. Other emissions reduction investments are concentrated on new or upgraded diesel engines for existing and new vessels, engine retrofits, and retrofitting with an after-treatment device. The suite of regulations includes implementation of Clean Air Act standards, MARPOL Annex VI, and designation of U.S. coasts as ECAs. The EPA estimates that the annual cost of its emissions reduction programs for ships operating in U.S. waters will hit $1.85 billion in 2020, and rise to $3.11 billion by 2030. Furthermore, the agency expects that regulations will increase the cost of shipping a trans-Pacific container by roughly $18, or approximately three percent of current operating costs. These additional costs are likely to be passed on to consumers through higher freight rates, although companies may still have to bear part of the costs. While the exact financial impacts cannot yet be determined, it is evident that the EPA regulation is of material concern to ship owners.

In SEC filings, disclosure on existing and emerging EPA regulations is prevalent among the top companies in the industry, indicating concern among market players about the potential impacts. For example, in its fiscal year (FY) 2013 annual SEC filing, Matson raises concern that air emissions regulations “may require costly vessel modifications, the use of higher-priced fuel and changes in operating practices that may not be recoverable through increased payments from customers.”

Globally, estimated environmental regulation costs to the industry are considerable: The Chairman of the International Chamber of Shipping stated in June 2013 that the IMO’s low-sulfur emissions requirements could cost the global shipping industry up to $550 billion between 2015 and 2025. These costs would cover capital upgrades to comply with 0.5 and 0.1 percent sulfur content fuel requirements. The lower sulfur content reduces the amount of PM and SOx emitted during combustion.

Some companies are turning to renewable energy in order to reduce their carbon emissions. Nippon Yusen, the largest Japanese shipping company, has installed solar panels on board a cargo carrier. While the project generates only 0.2 percent of the ship’s total energy, it can supply 6.5 percent of electricity used and reduce emissions by up to two percent. There are plans to install larger solar systems that could contribute up to two percent of a ship’s total energy needs. Researchers at the University of Tokyo are working on a wind power system that can provide supplemental energy to smaller cargo ships. These ships are in the 3,000 to 10,000 ton range,
and account for one fifth of cargo ships or 10,000 vessels.\textsuperscript{46}

In addition to mitigating regulatory risks and compliance costs, fuel efficiency efforts can also help reduce operating costs and shipping rates for customers. Fuel outlays are a significant cost to shipping companies and represent approximately 20 to 30 percent of total costs, so small improvements in fuel efficiency can lead to significant cost savings.\textsuperscript{47} However, since much of the fuel cost is passed onto customers in the form of fuel surcharges, incentives are low for ship owners to do costly upgrades since much of the fuel savings would be passed on to customers.\textsuperscript{48} Nevertheless, lower overall rates for shipping, fueled by lower fuel costs, could enable Marine Transportation companies to expand market share by offering competitive prices. In an industry with inherently low margins, high and variable fuel prices can have a material impact on profitability, providing incentives to lower fuel use.

**Value Impact**
Management of fuel use can provide operational efficiency and affect cost structure of companies in the industry. Shipping companies already face direct impacts from emission regulations, mainly through compliance costs and capital expenditure. As the push to reduce the carbon intensity of the industry continues, companies are forced to make capital expenditures to upgrade, retrofit, and modernize their fleets, as well as investments in emerging fuel management technology. Moreover, companies that regularly violate emissions standards can face increased extraordinary expenses due to fines. At the same time, capital expenditures for fuel efficiency could potentially reduce relative fuel expenses in the medium term. By cultivating its position as the most energy-efficient mode of transportation for goods, the Marine Transportation industry could benefit from increased public and governmental scrutiny around the issue of climate change, improving its brand value and share of the overall goods transportation market.

The magnitude of these impacts can be estimated using companies’ Global Scope 1 emissions, in absolute terms and relative to their peers. Additional factors for consideration include regions of operations and mitigation efforts, reflected in concrete emissions reduction targets. As international and national efforts continue to advance GHG regulations, including in the Marine Transportation industry, the probability and magnitude of these impacts are likely to increase in the near- to medium-term.

Management of energy efficiency and energy-mix (including renewables) is key to the profitability and risk profile of Marine Transportation companies. While the cost of energy consumption is already captured in financial results, overall energy consumption levels enable analysis of exposure to possible future increases in energy price, a result of internalizing the environmental and social externalities of energy consumption. Furthermore, since part of fuel costs are passed on to customers in the form of fuel surcharges, companies that are able to offer lower rates as a result of fuel savings may be more competitive in the market. Reliance on specific types of energy also creates operational
risks, which impact long-term profitability and, ultimately, the risk-profile of the company. Lastly, use of renewable energy indicates a firm’s ability to mitigate its carbon footprint and its exposure to energy cost increases driven by sustainability impact.

Ecological Impacts

Marine Transportation operations and waste disposal can create substantial environmental externalities such as water pollution and impacts on marine life. Seagoing vessels routinely discharge ballast water, bilge water, and untreated sewage. Ballast water is seawater pumped into special compartments in a ship’s hull to maintain stability after cargo is offloaded. When the ship takes on new cargo, the ballast water is discharged, often into an entirely different body of water than its origin, carrying with it invasive species. Bilge water accumulates along the bottom of the ship’s hull (the bilge), and can contain oil and other chemicals that leak from engines, equipment, and cargo.

Compliance with ballast water regulations can be costly. Illegal dumping of bilge water and other unregulated discharges have been prosecuted with hefty fines. Operating in areas with protected conservation status, like Emission Control Areas and Particularly Sensitive Sea Areas, can increase the risk of ecological impact and violation of more stringent environmental regulations.

Company performance in this area can be analyzed internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Percentage of time ships spend in areas of protected conservation status;
- Percentage of fleet with ballast water (1) exchange and (2) treatment; and
- Number and aggregate volume of spills and releases into the environment.

Evidence

Improper handling of ballast water and illegal disposal of bilge water and other wastes not only creates significant externalities, but also can create regulatory risks for companies, including restricting their activities in certain ports. According to the IMO, the spread of invasive species from ballast water is one of the world’s greatest ecological and economic threats. For example, the introduction of the invasive Zebra Mussel into the U.S. Great Lakes has decimated native species, clogged power plant water intake pipes, and fouled boat propellers. U.S. Congressional researchers estimated that zebra mussels cost the Great Lakes’ power plants roughly $3.1 billion between 1993 and 1999, due to clogged water intake pipes extending into the lakes. Furthermore, native species in the lakes are suffering, as the mussel has no natural enemies.49

In response to scientific concerns and negative economic impacts from invasive species, the International Convention for the Control and Management of Ships’ Ballast Water and Sediments (“Ballast Water Convention”) was adopted by the IMO in 2004. To go into effect, the convention must be sanctioned by at least 30 countries representing 35 percent or more of global shipping tonnage.

Once ratified, the convention will require expensive
equipment upgrades and training for ship crew. As of July 2014, 40 states representing 30.25 percent of world shipping tonnage have ratified the accord, and the remaining required signatures are expected soon.30

Regulations to limit introduction of invasive species are driving the implementation of preventative measures by shipping companies, including the exchange of ballast water far offshore and use of treatment systems. Once ratified, the IMO’s Ballast Water Convention will likely require most ships to install ballast water treatment systems, which cost between $500,000 and $4 million.51 Similarly, the U.S. Coast Guard published final ballast water rules in March 2012, establishing discharge standards. In their Form 10-Ks, top companies report the estimated cost of compliance. Hornbeck Offshore, a U.S.-based transporter, estimates the systems will cost the company approximately $250,000.52 Teekay Corp., a shipper headquartered in Bermuda, reports that the installation of ballast water treatment systems is estimated to cost the company between $2 and $3 million per vessel.53 Marshall Islands-based company Seaspan estimates the cost of such systems to be between $500,000 and $900,000 per vessel, depending on the size of the vessel.54

In addition to ballast water, unregulated disposal of wastes and other restricted substances can result in significant fines. Eagle Bulk Shipping cites liability under CERCLA in its FY2013 Form 10-K as “the greater of $300 per gross ton or $5.0 million for vessels carrying a hazardous substance as cargo or residue and the greater of $300 per gross ton or $500,000 for any other vessel.”55 In its FY2013 SEC filings, Kirby Corporation disclosed its involvement in clean up and restoration activities under CERCLA with respect to Superfund sites in Texas and Oregon. In Texas, Kirby Corp. is a Potentially Responsible Party (PRP) at the Gulfco Marine Maintenance facility, which was used for tank barge cleaning, sand blasting, and repair of vessels. At the Gulfco site, more than $6 million has been incurred for cleanup and EPA oversight costs to date. In Oregon, the company is one of 250 PRPs under CERCLA with respect to the Portland Harbor Superfund site.56

There have now been dozens of prosecutions for illegally discharging bilge water and other wastes, so-called ‘magic pipe’ cases, with fines in excess of a million dollars. ‘Magic pipe’ refers to instances where equipment is installed to bypass waste-handling systems like oily water separators to allow unregulated dumping in open water. Fines for noncompliance are prolific and steep, and penalties can sometimes include restrictions on accessing certain ports for a period of time. Over the last decade, the U.S. Coast Guard and the U.S. Department of Justice’s Environment and Natural Resources Division imposed criminal penalties of more than $200 million through the Vessel Pollution Program. The program led to criminal prosecutions of cruise ships, container ships, tank vessels, and bulk cargo vessels for illegal discharge of pollutants into the oceans, coastal waters, and inland waterways.57

Most recently, in July 2014, the operator of a ship was fined $500,000 for discharging 34 metric tons of oily bilge waste and waste sludge. The ship has been banned from calling on all U.S. ports for three
years. In 2013, Diana Shipping, a NYSE-listed global shipper, was convicted on charges related to unregulated discharge of waste oil and oil-contaminated wastewater. According to its FY2013 Form 20-F, the company was fined $1.1 million for “violating several U.S. statutes and regulations in failing to properly handle waste oils, maintain required records and for obstruction of justice.”

Also in 2013, two marine transportation companies, one based in Germany and the other in Cyprus, were sentenced to pay $10.4 million in criminal fines and coastal environment restoration funds. In 2012, two German companies were fined $1.2 million and barred from U.S. ports and waters for five years. The companies had allegedly dumped oily bilge water off the coasts of Alaska and Texas through ancillary hoses, bypassing discharge bilge water filtration systems required by law. Similarly, the Taiwanese shipping giant Evergreen International S.A. pleaded guilty to routinely ignoring U.S. and international laws prohibiting the disposal of untreated oil in U.S. waters for more than three years. In 2005, the company was ordered to pay $25 million in fines.

Shipping routes are an important factor in determining the ecological impacts of a ship’s operations. Melting arctic ice is opening up new routes for shipping vessels, which come with opportunities and challenges. Insurers are concerned about underwriting new routes where the risks from pollution are unknown. Operating in ecologically sensitive and protected areas also increases risk of ecological damage.

Value Impact
Reducing the risk of negative impacts on biodiversity and ecosystems through proper management of ballast, bilge, and waste water requires shipping companies to incur additional operating expenses and capital expenditure. Additionally, increasing regulations, particularly around ballast water, expose companies to one-time fines and extraordinary expenses. In more extreme situations, companies may be barred from operating in certain ports or routes, directly impacting market share and revenue growth. The percentage of ship duration in marine protected areas provides a sense of the exposure of shipping companies to the risk of ecological impacts, while the percentage of a company’s fleet with ballast water exchange and treatment indicates proactive risk management. These forward-looking metrics can be complemented by an understanding of past performance in mitigating ecological impacts, through the number and aggregate volume of spills and releases into the environment.

HUMAN CAPITAL

Human capital addresses the management of a company’s human resources (employees and individual contractors) as a key asset to delivering long-term value. It includes factors that affect the productivity of employees, such as employee engagement, diversity, and incentives and compensation, as well as the attraction and retention of employees in highly competitive or constrained markets for specific talent, skills, or education. It also addresses the management of labor relations in industries that rely on economies.
of scale and compete on the price of products and services. Lastly, it includes the management of the health and safety of employees and the ability to create a safety culture for companies that operate in dangerous working environments.

The Marine Transportation industry relies on many trained workers to manage complex ship and port logistics operations. Labor costs are a substantial outlay for companies in the industry. The management of employee health and safety is particularly important, and is discussed under the broader issue of “Accidents & Safety Management.”

BUSINESS MODEL AND INNOVATION

This dimension of sustainability is concerned with the impact of environmental and social factors on innovation and business models. It addresses the integration of environmental and social factors in the value creation process of companies, including resource efficiency and other innovations in the production process. It also includes product innovation and efficiency and responsibility in the design, use-phase, and disposal of products. It includes management of environmental and social impacts on tangible and financial assets—either a company’s own or those it manages as the fiduciary for others.

Innovation can help the Marine Transportation industry prevent and respond to accidents, and mitigate the industry’s environmental impacts. These aspects of innovation are discussed under the topics of “Environmental Footprint of Fuel Use” and “Accidents & Safety Management.”

LEADERSHIP AND GOVERNANCE

As applied to sustainability, governance involves the management of issues that are inherent to the business model or common practice in the industry and are in potential conflict with the interests of broader stakeholder groups (government, community, customers, and employees). They therefore create a potential liability, or worse, a limitation or removal of license to operate. This includes regulatory compliance, lobbying, and political contributions. It also includes risk management, safety management, supply chain and resource management, conflict of interest, anti-competitive behavior, and corruption and bribery.

Due to the international nature of the Marine Transportation industry, many companies find themselves operating in countries where corruption is widespread. Maintaining business ethics under such circumstances can be challenging and can create risks for companies. Furthermore, accident management is a crucial aspect of governance, given the tremendous environmental and human impacts ship accidents can have.

Business Ethics

Collusive facilitation payments at ports, considered standard business practice in some countries, are
often necessary to obtain permits, cargo clearance, and port berths. However, anti-bribery laws, including the U.S. FCPA and the U.K.’s 2010 Bribery Act, place pressure on operators to alter this practice. Shipping companies report that bribery is widespread in the industry, and while evidence of legal action is sparse, the cost of doing business is greatly affected. Bribery and corruption at ports add to the cost of business. In addition, the broader economic and social costs of corruption are significant. As the U.K. Bribery Act comes into full effect and enforcement of the FCPA continues, bribery allegations could create significant legal costs for companies.

Industry leaders are joining associations like the MACN to signal their commitment to anti-corruption principles and adherence to international anti-bribery regulations. The MACN aims to develop country-specific programs to tackle corruption challenges, including collaboration with local agencies to target the root cause of corruption. Companies that are able to develop standardized documentation and anti-bribery contractual terms that employees and third party affiliates agree with may be able to reduce risk.

Company performance in this area can be analyzed internally and externally though the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Number of calls at ports with high risk of corruption; and
- Legal and regulatory fines associated with bribery or corruption.

Evidence

Operating internationally, shipping companies have agents in many countries working under various anti-bribery and anti-corruption laws and customs. This exposure increases the risk of liability from the actions of affiliated agents who may make facilitation payments to government officials or others to conduct business in a country on a company’s behalf. Shipping companies may be able reduce risk by monitoring employee and affiliate actions, performing due diligence in the contracting process, and through ongoing training.

Bribery can be an expensive addition to business transactions: a 2008 Harvard University study found that bribes can raise the cost of shipping a standard 20-foot container by 14 percent. These costs are generally passed on to consumers, which may reduce demand for shipping, or cause consumers to shift demand to operators offering cheaper rates. Furthermore, facilitation payments can squeeze profit margins to the extent that they cannot be recouped fully through higher rates.

The Organization of Economic Cooperation and Development (OECD)’s 1997 Convention on Combating Bribery of Foreign Public Officials in International Business Transactions established jurisdiction and monetary penalties for bribery of foreign officials by OECD-based companies. The Convention targets the supply side of bribery. The UK’s 2010 Bribery Act expanded upon the OECD Convention by introducing strict liability in instances of bribery: Companies and individuals can be penalized even if they are not directly guilty or if they have no knowledge of a crime. One of the
strictest anti-bribery laws in existence, it may serve as a model for other countries. The U.S. FCPA maintains similar standards. Penalties for violating FCPA can be high - as much as $2 million in criminal fines for corporations and $250,000 for individuals. This trend toward severe regulation threatens current industry practices.

Some industry players disclose the risk of FCPA violations in their annual SEC filings. For example, Genco Shipping & Trading reports that they “charter [their] vessels into some jurisdictions that international corruption monitoring groups have identified as having high levels of corruption,” adding that this “create[s] the risk of unauthorized payments or offers of payments by one of our employees or agents that could be in violation of the FCPA or other applicable anti-corruption laws.” Gulfmark Offshore goes further: “We have an ongoing program of proactive procedures to promote compliance with the FCPA and other similar anti-bribery and anti-corruption laws, but we may be held liable for actions taken by our strategic or local partners or agents even though these partners or agents may not themselves be subjected to the FCPA or other similar laws.”

Additionally, industry-wide initiatives, like the Maritime Anti-Corruption Network, aim to reduce corruption by promoting good corporate practices that adopt governance principles, sharing best practices, and creating awareness of current and future challenges.

Value Impact
Bribes can put downward pressure on profit margins if cost cannot fully be passed on to consumers. In addition, violations of anti-corruption laws could result in substantial fines, sanctions, and civil and criminal penalties, creating extraordinary expenses and contingent liabilities. Regulatory actions could also curtail operations in certain jurisdictions, and actual or alleged violations could damage a company’s reputation and ability to do business, with impact on revenue and long-term growth prospects. Companies with a record of facilitation payments or non-compliance with regulations could also face higher costs of capital due to a higher risk premium. The number of calls at ports with high risk of corruption indicate shipping companies’ exposure to the risk of corruption, while legal and regulatory fines associated with bribery or corruption characterize past performance as a proxy for how well companies manage this issue and provide an understanding of the probability and magnitude of incidents.

Accidents & Safety Management
Notorious incidents such as the 1989 Exxon Valdez spill, the second-largest U.S. oil spill, underscore accident management as a complex and crucial aspect of Marine Transportation. Incidents such as these can have wide-ranging repercussions for a company’s employees, the environment, and valuable property, as well as financial impacts on companies themselves.
Marine Transportation workers face dangers including hazardous weather and exposure to large machinery and heavy cargo. The greatest health and safety risks stem from unloading and loading cargo at ports. Ships must be loaded and unloaded quickly and on schedule, increasing injury risk, fatigue, and stress.

The health and well-being of workers in the industry is linked inextricably to the safety performance of the company, as a healthy crew is necessary for safe voyages. It can also affect the probability and magnitude of accidents or leaks. The reliance of the global marketplace on the shipping industry means that voyages need to be made within precise timeframes. Therefore, safety and efficiency are closely related, and safety performance is an indication of efficiency.

Costs of accidents on human safety, the environment, and property can be astronomical when involving large vessels. International conventions dictate that flag states are the primary authorities in charge of implementing marine safety legislations. Additionally, “port state control” gives countries the right to inspect any vessel coming to their ports in accordance with IMO conventions. The IMO defines a deficiency as the violation of, or deviation from, international convention measures that should be rectified. Sometimes a deficiency can lead to a detention of the ship until it is rectified. In addition, more than 90 percent of the world’s cargo carrying tonnage is covered by a classification system set by the members of the International Association of Classification Societies, which is dedicated to “safe ships and clean seas.” The condition of each ship, including conditions of the hull and equipment, is evaluated on an annual basis and a class is assigned from “first or highest class” down.

In order to reduce the risk of accidents and comply with international regulations, companies must implement extensive safety measures, including employee training programs, periodic dry-docking maintenance periods, and annual class renewal surveys conducted by classification societies (nongovernmental organizations who establish technical and operational standards for ships). As mentioned earlier, flag and port states have jurisdiction to enforce international conventions on safety.

Company performance in this area can therefore be analyzed internally and externally through the following direct or indirect performance metrics (see Appendix III for metrics with their full detail):

- Number of serious marine incidents;
- Lost time injury rate;
- Number of Conditions of Class or Recommendations; and
- Number of port state control deficiencies and detentions.

Evidence

Although the IMO compiles data on ship casualties, industry-level information is not easily available due to the international nature of shipping. The International Shipping Federation estimates that the indirect costs of maritime accidents are a factor of three compared to the direct costs in terms of casualties, fatalities, and property damage. Indirect costs include, among other things, lost work hours,
environmental remediation costs, and increases in insurance premiums.  

Casualty rates have been on the decline on average; however, there are still losses of life and ships, which can have material financial implications for companies. The International Association of Dry Cargo Shipowners, Intercargo, reported a decline in casualties from an average of 74 lives and 135 ships lost per year in the 1990s to 26 lives and 5.9 ships lost per year in the following decade. In 2011, however, 38 lives were lost on 13 vessels. In 2012, there were 14 deaths in accidents without loss of dry bulk vessels. 

A 2012 report by the International Trade Federation was one of the first analyses of health and safety conditions at international shipping terminals. It found that fatalities are very infrequent, but that injuries and persistent health conditions such as back pain and high stress are far more common. Evidence from OSHA supports this: In 2012, the average number of nonfatal occupational injuries per 100 full-time marine cargo handlers was 5.8, the highest among major transportation industries.

Ship officers are responsible for the safe maneuvering of vessels and cargo. Lapses in judgment have contributed to ship grounding and sinking as well as releases of hazardous cargo. Negative media attention and massive cleanup costs can severely damage a company’s finances.

According to the IMO public database, of the 105 “very serious” incidents in 2013, 72 involved cargo ships. “Very serious” incidents are those that involve total loss of the ship, loss of life, or severe pollution. In 2011, the cargo ship Rena ran aground off the north coast of New Zealand, spilling 350 tons of fuel oil and more than one thousand containers into the sea. Some contained hazardous materials. The ship was owned by Costamare, a Greek shipping company publicly traded in the U.S. Costamare was ordered to pay $32 million for environmental remediation of the spilled oil, and the ship’s ongoing salvage has cost $300 million thus far. The ship’s captain and navigation officers were sentenced to seven months in jail for “operating the vessel in a dangerous manner.”

The notorious 2002 sinking of the Prestige oil tanker off the coast of Spain generated a lot of negative publicity and billions of dollars in cleanup costs. In 2012, the Spanish government filed claims against the ship’s insurers for €4.33 billion, while France claimed €86 million in damages. The countries are seeking a 12-year prison sentence for the vessel’s captain. Establishing ownership of the vessel in this case was difficult because of flag state provisions. Companies are allowed to register a ship under the flag of a country entirely unassociated with the company’s operations or presence, and as a result they can gain tax or regulatory advantages. While this practice is not illegal, it is controversial. Spanish, French, and Portuguese authorities had difficulty determining which entity to sue since the
ship was registered in the Bahamas, controlled by a Greek company, and owned by an entity in Liberia.86

The importance of the issue is highlighted in Eagle Bulk Shipping’s FY2013 Form 10-K. The company states that “most insurance underwriters make it a condition for insurance coverage that a vessel be certified as ‘in class’ by a classification society which is a member of the International Association of Classification Societies.”87 Maintaining vessels “in class” is therefore important for shipping companies to gain adequate and affordable insurance coverage. Furthermore, as mentioned earlier, discovery of port state control deficiencies can lead to detentions. Between 2002 and 2009, the average port state control non-compliance rate was consistently around 50 percent, while detention rates declined from 8.6 percent to 5.3 percent.88 Detentions can be costly in terms of delays and maintenance expenditure, as ships are prevented from leaving port until the deficiencies have been corrected.

Value Impact

Fatal and nonfatal occupational injuries involving employees or accidents with large environmental impacts can materially impact Marine Transportation companies through regulatory fines and penalties and private lawsuits, as well as remediation costs or compensation payments to affected parties, resulting in extraordinary expenses and contingent liabilities. Companies may also incur additional operating costs due to lost employee hours, medical expenses, and sick leave as a result of health and safety incidents. Higher labor standards and safety protocols in developed and developing nations may require employee training and equipment upgrades, increasing operating costs. Noncompliance with safety standards can lead to additional extraordinary expenses due to regulatory fines. Detention at port following safety inspections can result in lost revenues. Furthermore, accidents that result in loss of, or damage to, ships can lead to tangible asset impairments and create asset-salvage costs. Insurance coverage may become more expensive or unattainable, increasing a company’s risk premium and ultimately its cost of capital.

Incident-based safety metrics (accidents and incidents; lost time injury rate) characterize past performance as a proxy for how well companies manage this issue, and provide an understanding of the probability and magnitude of incidents. Safety violations, together with a description of a company’s Safety Management System, provide complementary forward-looking insight on how companies are likely to perform in the future.

SASB INDUSTRY WATCH LIST

The following section provides a brief description of sustainability issues that did not meet SASB’s materiality threshold at present, but could present a material issue in the future.

End-of-Life Management: Ship breaking, or end-of-life disposal, has long been controversial due to potential for environmental externalities and poor labor conditions, including exposure to hazardous materials and use of child labor. Hazardous materials can leak into the ground or sea as a ship is dismantled.
Companies generally sell ships to intermediate brokers who in turn sell them to ship-breaking yards, most often in South Asia. There, ships are beached, and informal workers dismantle them with few or no safety precautions or environmental standards. While there is little or no evidence of negative material impact to shippers from scrapping, regulations such as the IMO’s Hong Kong Convention are increasing regulatory interest in the matter. The Hong Kong Convention, adopted in 2009, aims to ensure that ships do not pose unnecessary risks to human health, safety, and the environment when recycled. The E.U. Commission has created a new ship recycling regulation similar to the Hong Kong Convention, which will come into effect 24 months after ratification by 15 states, which represent 40 percent of world merchant shipping by gross tonnage. These regulations, if implemented and enforced, could create material risks for companies in the Marine Transportation industry in the future.

As a result, companies are starting to disclose the topic in their SEC Filings. For example, Eagle Bulk Shipping, a U.S. carrier, reports in its FY 2013 Form 10-K that concern among “regulators and charterers is leading to greater inspection and safety requirements on all vessels and may accelerate the scrapping of older vessels throughout the dry bulk shipping industry.” Furthermore, Overseas Shipholding, also a U.S. carrier, reports figures on the estimated scrap value of their international flag vessels.
APPENDIX I
FIVE REPRESENTATIVE MARINE TRANSPORTATION COMPANIES

<table>
<thead>
<tr>
<th>COMPANY NAME (TICKER SYMBOL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costamare, Inc. (CMRE)</td>
</tr>
<tr>
<td>Matson, Inc. (MATX)</td>
</tr>
<tr>
<td>Danaos Corp. (DAC)</td>
</tr>
<tr>
<td>Baltic Trading, Inc. (BALT)</td>
</tr>
<tr>
<td>Eagle Bulk Shipping (EGLE)</td>
</tr>
</tbody>
</table>

This list includes five companies representative of the Marine Transportation industry and its activities. This includes only companies for which the Marine Transportation industry is the primary industry, companies that are U.S.-listed but are not primarily traded Over-the-Counter, and for which at least 20 percent of revenue is generated by activities in this industry, according to the latest information available on Bloomberg Professional Services. Retrieved on June 11, 2014
# APPENDIX IIA

## EVIDENCE FOR SUSTAINABILITY DISCLOSURE TOPICS

<table>
<thead>
<tr>
<th>Sustainability Disclosure Topics</th>
<th>Evidence of Interest</th>
<th>Evidence of Financial Impact</th>
<th>Forward-Looking Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HM (1-100)</td>
<td>IWGs</td>
<td>%</td>
</tr>
<tr>
<td>Environmental Footprint of Fuel Use</td>
<td>50*</td>
<td>67</td>
<td>1</td>
</tr>
<tr>
<td>Ecological Impacts</td>
<td>63*</td>
<td>83</td>
<td>3</td>
</tr>
<tr>
<td>Business Ethics</td>
<td>45*</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>Accidents &amp; Safety Management</td>
<td>50*</td>
<td>100</td>
<td>2</td>
</tr>
</tbody>
</table>

**HM:** Heat Map, a score out of 100 indicating the relative importance of the topic among SASB’s initial list of 43 generic sustainability issues; asterisks indicate “top issues.” The score is based on the frequency of relevant keywords in documents (i.e., 10-Ks, shareholder resolutions, legal news, news articles, and corporate sustainability reports) that are available on the Bloomberg terminal for the industry’s publicly-listed companies; issues for which keyword frequency is in the top quartile are “top issues.”

**IWGs:** SASB Industry Working Groups

**%:** The percentage of IWG participants that found the disclosure topic to likely constitute material information for companies in the industry. (-) denotes that the issue was added after the IWG was convened.

**Priority:** Average ranking of the issue in terms of importance. One denotes the most important issue. (-) denotes that the issue was added after the IWG was convened.

**EI:** Evidence of Interest, a subjective assessment based on quantitative and qualitative findings.

**EFI:** Evidence of Financial Impact, a subjective assessment based on quantitative and qualitative findings.

**FLI:** Forward Looking Impact, a subjective assessment on the presence of a material forward-looking impact.
## APPENDIX IIB

**EVIDENCE OF FINANCIAL IMPACT FOR SUSTAINABILITY DISCLOSURE TOPICS**

<table>
<thead>
<tr>
<th>Evidence of Financial Impact</th>
<th>REVENUE &amp; EXPENSES</th>
<th>ASSETS &amp; LIABILITIES</th>
<th>RISK PROFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenue</td>
<td>Operating Expenses</td>
<td>Non-operating Expenses</td>
</tr>
<tr>
<td>Market Size</td>
<td>New Markets</td>
<td>Pricing Power</td>
<td>COGS</td>
</tr>
<tr>
<td>Environmental Footprint of Fuel Use</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Ecological Impacts</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Business Ethics</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Accidents &amp; Safety Management</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- ●: MEDIUM IMPACT
- ●: HIGH IMPACT
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>ACCOUNTING METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental Footprint of Fuel Use</strong></td>
<td>Gross global Scope 1 emissions</td>
<td>Quantitative</td>
<td>Metric tons CO₂-e</td>
<td>TR0301-01</td>
</tr>
<tr>
<td></td>
<td>Description of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>TR0301-02</td>
</tr>
<tr>
<td></td>
<td>Total energy consumed, percentage from heavy fuel oil, percentage from renewables</td>
<td>Quantitative</td>
<td>Gigajoules, Percentage (%)</td>
<td>TR0301-03</td>
</tr>
<tr>
<td></td>
<td>Air emissions for the following pollutants: NOₓ, SOₓ, and particulate matter (PM)</td>
<td>Quantitative</td>
<td>Metric tons (t)</td>
<td>TR0301-04</td>
</tr>
<tr>
<td></td>
<td>Energy Efficiency Design Index (EEDI) for new ships</td>
<td>Quantitative</td>
<td>Grams of CO₂ per ton-nautical mile</td>
<td>TR0301-05</td>
</tr>
<tr>
<td><strong>Ecological Impacts</strong></td>
<td>Shipping duration in marine protected areas and areas of protected conservation status</td>
<td>Quantitative</td>
<td>Number of travel days</td>
<td>TR0301-06</td>
</tr>
<tr>
<td></td>
<td>Percentage of fleet implementing (1) ballast water exchange and (2) ballast water treatment</td>
<td>Quantitative</td>
<td>Percentage (%)</td>
<td>TR0301-07</td>
</tr>
<tr>
<td></td>
<td>Number and aggregate volume of spills or releases to the environment</td>
<td>Quantitative</td>
<td>Number, Cubic meters (m³)</td>
<td>TR0301-08</td>
</tr>
<tr>
<td><strong>Business Ethics</strong></td>
<td>Number of calls at ports in countries that have the 20 lowest rankings in Transparency International’s Corruption Perception Index</td>
<td>Quantitative</td>
<td>Number</td>
<td>TR0301-09</td>
</tr>
<tr>
<td></td>
<td>Amount of legal and regulatory fines and settlements associated with bribery or corruption⁴</td>
<td>Quantitative</td>
<td>U.S. Dollars ($)</td>
<td>TR0301-10</td>
</tr>
<tr>
<td><strong>Accidents &amp; Safety Management</strong></td>
<td>Number of serious marine incidents⁵</td>
<td>Quantitative</td>
<td>Number</td>
<td>TR0301-11</td>
</tr>
<tr>
<td></td>
<td>Lost time injury rate</td>
<td>Quantitative</td>
<td>Rate</td>
<td>TR0301-12</td>
</tr>
<tr>
<td></td>
<td>Number of Conditions of Class or Recommendations</td>
<td>Quantitative</td>
<td>Number</td>
<td>TR0301-13</td>
</tr>
<tr>
<td></td>
<td>Number of port state control (1) deficiencies and (2) detentions</td>
<td>Quantitative</td>
<td>Number</td>
<td>TR0301-14</td>
</tr>
</tbody>
</table>

⁴ Note to TR0301-10 - Disclosure shall include a description of fines and settlements and corrective actions implemented in response to events.

⁵ Note to TR0301-11 - Disclosure shall include a description of serious marine incidents, outcomes, and corrective actions implemented in response.
APPENDIX IV: Analysis of SEC Disclosures
Marine Transportation

The following graph demonstrates an aggregate assessment of how the top ten U.S.-listed Marine Transportation companies by revenue are currently reporting on sustainability topics in the SEC Disclosures.

*Percentage of IVG participants that agreed topic was likely to constitute material information for companies in the industry.
References

1 Bloomberg Professional Services, Bloomberg Industries Industry Primer (BI SHIPG), "Marine Shipping is $37.5 Billion Market, Three Major Segments." Accessed August 19, 2014.

2 Author’s calculations based on data from Bloomberg Professional service accessed on June 11, 2014, using the ICS <GO> command. The data represents global revenues of companies listed on global exchanges and traded over-the-counter from the Marine Transportation industry, using Levels 3 and 4 of the Bloomberg Industry Classification System.

3 Author’s calculation based on data from Bloomberg Professional service, accessed on July 10, 2014 using EQS screen for U.S. listed companies (including those traded primarily OTC) and generating at least 20 percent of revenue from Marine Transportation segment.

4 “Global Deep-Sea, Coastal & Inland Water Transportation” IBISWorld, April 2014.

5 “Global Deep-Sea, Coastal & Inland Water Transportation” IBISWorld, April 2014, p.23.

6 Author’s calculation based on data from Bloomberg Professional service, accessed on July 10, 2014 using EQS screen for U.S. listed companies (including those traded primarily OTC) and generating at least 20 percent of revenue from Marine Transportation segment.


42 Author’s analysis of the latest Form 10-Ks of top ten U.S.-listed Marine Transportation companies.
47 “Global Deep-Sea, Coastal & Inland Water Transportation,” IBISWorld, April 2014, p.18.
60 Diana Shipping Inc., FY13 Form 20-F for the Period Ending December 31, 2013 (filed March 27, 2013), p.34.


