

# Mapping Canadian Maritime Industry Initiatives to UN Sustainable Development Goals





## About Us

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Clear Seas is a Canadian not-for-profit organization that provides independent fact-based information to enable governments, industry, and the public to make informed decisions on marine shipping issues. We work to build awareness and trust so that all people can feel a part of the marine sector. Our vision is a sustainable marine shipping sector that is safe, vibrant, and inclusive, both now and for future generations.

Clear Seas' research and publications are made available at [clearseas.org](https://clearseas.org)

## About This Report

Clear Seas completed research on **Mapping Canadian Maritime Industry Initiatives to UN Sustainable Development Goals** to understand how the different sectors of the maritime industry in Canada are contributing to the achievement of the United Nations Sustainable Development Goals (UN SDGs). Assessing the relevance

of the Green Marine performance indicators to the UN SDGs was a key component of the analysis. The outcomes of this research will support organizations with a mapping tool for reporting on sustainability initiatives to relate a range of initiatives back to the relevant UN SDGs.

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## Message from the Executive Director

The United Nations (UN) Sustainable Development Goals (SDGs) were designed as an urgent call for action by all countries to prioritize strategies that would lead to peace and prosperity for people and the planet, now and into the future. Launched in 2015, these goals are intended to be achieved by 2030; we are more than halfway to that date yet the 2024 report reveals that only seventeen per cent of SDGs targets are on track to be achieved, nearly half are showing minimal or moderate progress, and progress on over a third has stalled or even regressed. At Clear Seas, we were curious to find out how the maritime industry contributes to achieving these goals and what progress is being made in Canada.

Because marine shipping activity is both global and local, comprising many different sectors and organizations, a universal framework for discussing sustainability efforts is difficult to find. While not created with the maritime industry in mind, the UN Sustainable Development Goals (SDGs) could provide just such an internationally understood structure. Further, the SDGs mark internationally agreed priorities that the maritime industry can draw from to contribute to a more sustainable and equitable future for all.

The goal of this research project was therefore twofold. First, identifying the connections between the SDGs and the maritime industry provides a summary of the most relevant goals and initiatives for organizations to consider when developing and reporting on their sustainability efforts. Second, mapping the linkages between current maritime industry sustainability initiatives and SDGs provides maritime sector operators with an established way to convey their sustainability efforts to people who may not be familiar with the maritime industry.

Whether engaging with municipalities, other industries, or the public, the maritime industry can use the SDGs as a common language for sustainability impact. Our intent with this research is to create resources that will make it easier for organizations to share and celebrate their sustainability efforts and to serve as inspiration for those that want to contribute to peace and prosperity for people and the planet, now and into the future.

## Acronyms and Abbreviations

ACPA	Association of Canadian Port Authorities
CDP	Carbon Disclosure Project
CIF	Canadian Indicator Framework
CSI	Clean Shipping Index
EMS	Environmental Management System
ESG	Environmental, Social, and Governance
ESI	Environmental Ship Index
GHG	Greenhouse Gases
GRI	Global Reporting Initiative
IMO	International Maritime Organization
ISO	International Organization for Standardization
KPI	Key Performance Indicator
NO <sub>x</sub>	Nitrogen Oxide
PM	Particulate Matter
QHSE	Quality, Health, Safety, and Environment
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goal
SO <sub>x</sub>	Sulphur Oxide
TCFD	Task Force on Climate-Related Financial Disclosures
UN	United Nations

## Executive Summary

In 2015, the United Nations (UN) published a resolution with targets and indicators for each of 17 Sustainable Development Goals (SDGs) that include everything from ending poverty, to taking climate action, to reducing inequalities. At the halfway mark to the 2030 objectives, Clear Seas undertook a project to investigate how the maritime industry in Canada is supporting the achievement of these goals. Although the SDGs were not specifically intended for use by the maritime industry, many organizations are engaged in sustainability efforts and undertake to report on the impact of these efforts.

This research project was led by Clear Seas, in collaboration with Green Marine, a non-profit organization that runs the leading voluntary environmental certification program for the maritime industry, and with support from the Association of Canadian Port Authorities (ACPA).

Clear Seas conducted an analysis to map existing, publicly available reports and sustainability metrics against the UN SDGs and generate a comprehensive overview of the many ways that the maritime industry is or could be supporting these goals. The analysis examines to what extent industry players currently use SDGs in their reporting and proposes a mapping tool to relate future maritime industry initiatives to the SDGs.

As part of this process, Clear Seas worked in collaboration with Green Marine to identify how performance indicators of Green Marine's certification program, one of the leading environmental reporting methods used in the Canadian maritime industry, relate to the UN SDGs.

The analysis revealed that some SDGs and supporting indicators are relevant to the maritime sector and others are not, as shown in Figure 1. Of those SDGs that are relevant to the maritime sector, the environment-focused goals were most relevant to Green Marine's sustainability indicators. Results of this study demonstrate that eight SDGs (Goals #3, 7, 8, 11, 12, 13, 14, 15) have high relevance for the maritime industry and that, out of the 169 SDG targets, just over one-third (61) are relevant to the maritime industry. Further, the analysis shows that the Green Marine certification contributes to 11 out of the 17 SDGs. As of January 2024, just over two-thirds (67%) of Canadian maritime industry reports mentioned the SDGs and one-third connected the SDGs to organization sustainability initiatives.

## UN Sustainable Development Goals most relevant to the maritime industry

Although the SDGs were not specifically developed for use by the maritime industry, many of the SDGs are relevant to the marine sector and can be used by the maritime industry to prioritize and report on sustainability efforts using an internationally understood framework.

The goals highlighted here have the greatest potential for the maritime industry to have a positive impact on peace and prosperity for people and the planet.



Figure 1. United Nations Sustainable Development Goals most relevant to the maritime industry

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# Mapping Canadian Maritime Industry Initiatives to UN Sustainable Development Goals

## 1.0 Introduction

The United Nation (UN) Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals for sustainability established in 2015 and intended to be achieved by 2030. While the SDGs provide a set of global measures to achieve, they do not dictate local implementation of these goals, which is left up to each nation and organizations and individuals within each nation.

Marine shipping activity is both international and domestic, comprising many different sectors and organizations. Within Canada, actors in the maritime industry use various environmental and sustainability metrics to report their progress, which can make it difficult to compare between actors or gauge overall impact at an industry level.

The SDGs provide a universal, internationally understood structure to summarize industry sustainability efforts. Varied efforts undertaken by Canadian port authorities, terminal operators, shipyards, shipowners and ship-operators and others have supported Canada's contributions to the SDGs, but to date there is no summary of the efforts made on these measures. Creating a tool to map the SDGs to industry initiatives, as well as to other reporting methods, will assist interested industry actors to easily apply the SDGs to their existing work and assist with planning future initiatives.

### 1.1 Research Objectives

The purpose of this study was to understand the Canadian maritime industry's efforts toward achieving the SDGs, with the overarching questions: How is the industry contributing? And is this contribution being captured?

Clear Seas also worked in collaboration with Green Marine, a non-profit organization that manages the leading voluntary environmental certification program for the maritime industry, to identify how the performance indicators of its certification program relate to the SDGs.

The analysis identified which of the 17 goals have the most relevance for the maritime industry, proposed a tool for mapping maritime industry initiatives and environmental reporting methods to the SDGs, and examined to what extent industry players were using SDGs in their reporting as of January 2024.

### 1.2 Research Approach

The research in this report was led by Clear Seas, in collaboration with Green Marine and with support from the Association of Canadian Port Authorities (ACPA). The three organizations undertook scoping discussions in early 2023. Once the objectives, scope, and methodology were determined, Clear Seas began the research in June 2023. Green Marine contributed to identifying SDG targets relevant to the maritime industry. A key component of the study, mapping Green Marine performance indicators to SDGs, was led by Green Marine. Clear Seas completed the analysis and prepared this report and supporting graphics, with input from Green Marine and ACPA.

### 1.3 Report Structure

Section 2.0 provides background on the SDGs and how they are applied both globally and within Canada. It includes an overview of the Canadian maritime industry's opportunities for contribution and how the industry already contributes by following international and Canadian-specific regulations. This section also provides details on environmental and sustainability reporting methods used in Canada, including the Green Marine certification, which was mapped to SDGs in the study.

Sections 3.0 and 4.0 outline the methods used to gather, process, and analyze data in this study. The methods section is comprised of two main parts: the development of a tool for mapping SDGs to maritime industry initiatives and applying the tool to map Green Marine performance indicators to the SDGs (Section 3.0), and a content analysis of industry reports that examines if and how organizations are currently reporting on sustainability using SDGs (Section 4.0).

Section 5.0 presents the results of the study, including the outcomes of mapping Green Marine performance indicators to SDGs and the content analysis of industry reports, comparing the SDGs that are most frequently reported to the SDGs that are most relevant to the maritime industry.

Sections 6.0 and 7.0 summarize the findings of this report and provide recommendations.

## 2.0 Overview of Sustainable Development Goals

### 2.1 SDGs as a Framework

The UN SDGs are a collection of 17 interlinked global goals for sustainability established in 2015 and intended to be achieved by 2030. Each SDG includes: 1) specific targets or sub-goals to be met; and 2) indicators or specific measures to measure progress toward each target.<sup>1</sup> Each SDG typically has 8 to 12 targets, and each target has between 1 and 4 indicators to measure progress. Within the 17 SDGs, there are 169 targets and more than 230 indicators. The 17 SDGs cover a wide range of themes, as summarized in Figure 2:



**Figure 2. United Nations Sustainable Development Goals Summary (source: United Nations)**

Researchers at the Stockholm Resilience Centre at Stockholm University created a model, referred to as the “SDG Wedding Cake”, that sorts the SDGs into three interrelated categories (shown in Figure 3): 1) Biosphere; 2) Society; and 3) Economy.<sup>2</sup> The three categories build on each other, starting with the natural environment before addressing societal issues and then economic development.

<sup>1</sup> United Nations. (n.d.). *Sustainable Development Goals*. Department of Economic and Social Affairs. Retrieved May 1, 2024, from <https://sdgs.un.org/goals>

<sup>2</sup> Folke, C., Biggs, R., Norstrom, A.V., Reyers, B., & Rockstrom, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, 21(3). <http://dx.doi.org/10.5751/ES-08748-210341>

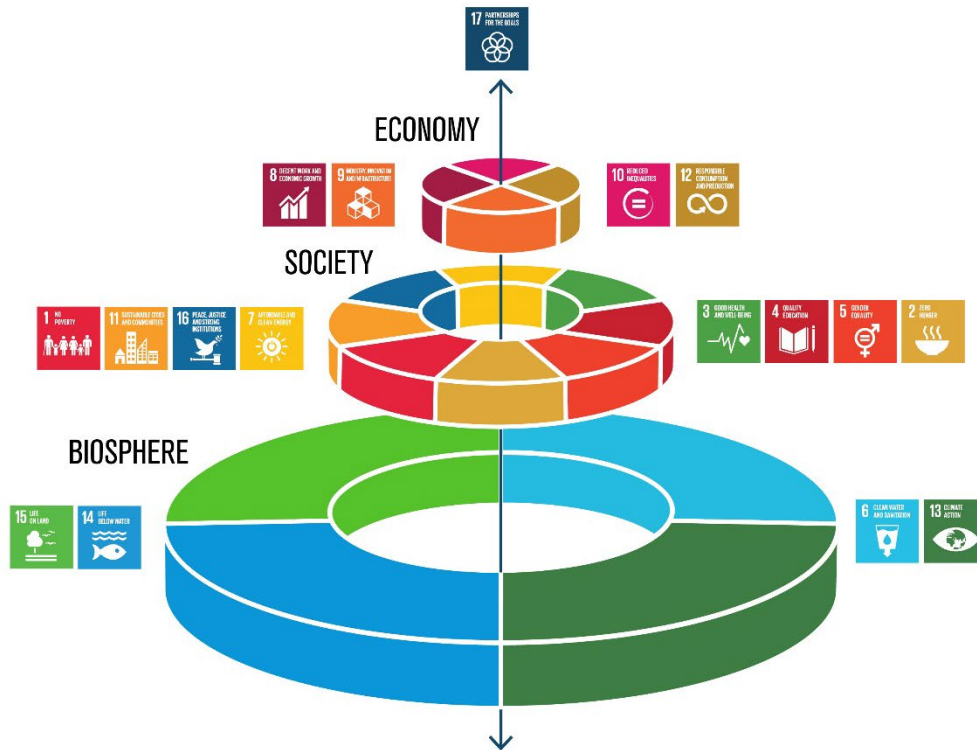


Figure 3. United Nations Sustainable Development Goals Categories (source: [Stockholm Resilience Centre](https://www.stockholmresilience.org/en/our-work/2019/05/2019-05-20-17-un-sustainable-development-goals-categories))

Biosphere goals include:

- Goal #6 Clean Water and Sanitation
- Goal #13 Climate Action
- Goal #14 Life Below Water
- Goal #15 Life on Land

Society goals include:

- Goal #1 No Poverty
- Goal #2 Zero Hunger
- Goal #3 Good Health and Wellbeing
- Goal #4 Quality Education
- Goal #5 Gender Equality
- Goal #7 Affordable and Clean Energy
- Goal #11 Sustainable Cities and Communities
- Goal #16 Peace, Justice, and Strong Institutions

Economy goals include:

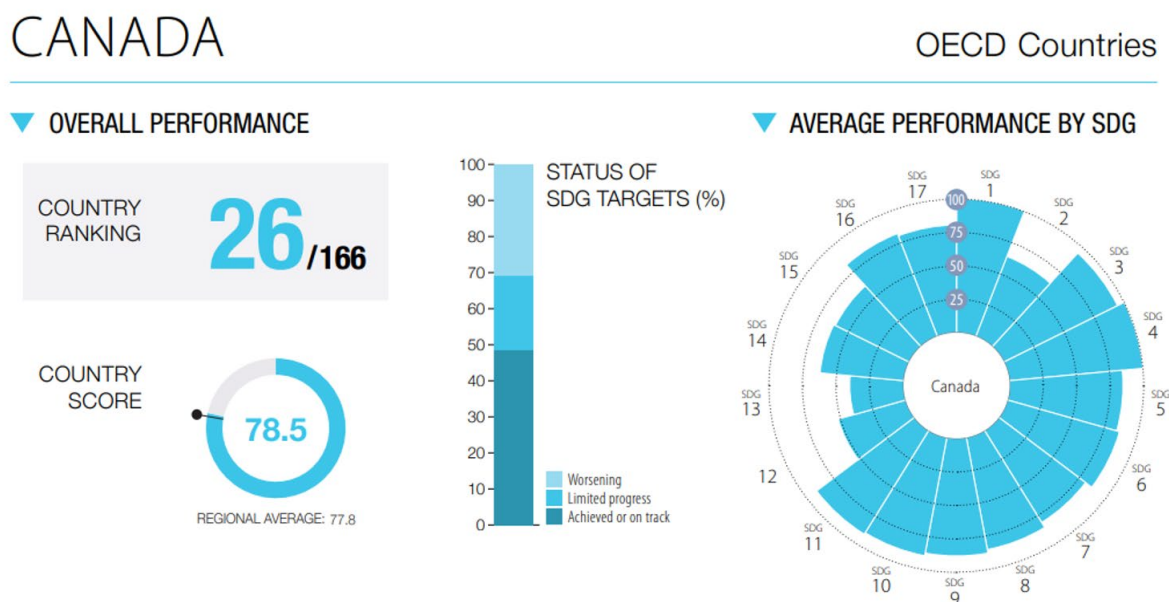
- Goal #8 Decent Work and Economic Growth
- Goal #9 Industry, Innovation, and Infrastructure
- Goal #10 Reduce Inequalities
- Goal #12 Responsible Consumption and Production

Goal #17 Partnership for the Goals exists outside the three categories as an overarching goal and outcome when the other SDGs are achieved.

While the SDGs provide a set of global measures to achieve, they do not dictate local implementation of these goals, which is left up to each nation as well as organizations and individuals within each nation. While they were originally conceived for action on a national level, the SDGs also provide a useful universal framework that can be applied to different contexts.

## 2.2 SDGs in the Canadian Context

In a ranking of all 193 UN Member States, as part of the 2023 analysis, Canada ranked 26<sup>th</sup> with a score of 78.5 (Figure 4), which can be interpreted as 78.5% of SDGs achieved.<sup>3</sup>



**Figure 4. Overview of Canada's Progress Toward SDGs as of 2023 (source: [United Nations](https://dashboards.sdgindex.org/profiles/canada))**

To fully achieve an SDG, a country must meet all of the goal's targets. As of 2023, the only SDG that Canada had fully achieved was SDG #1 No Poverty. Eight SDGs (#2, 4, 6, 8, 12, 13, 15, 16) were ranked as facing significant challenges/stagnating in Canada. The remaining eight SDGs (#3, 5, 7, 9, 10, 11, 14, 17) were ranked as moderately improving/challenges remain. Just under 50% of the total 169 targets were on track or had been achieved, whereas about 30% were worsening.<sup>3</sup>

<sup>3</sup> United Nations. *Sustainable Development Report 2023*. Retrieved Jan 15, 2024, from <https://dashboards.sdgindex.org/profiles/canada>



The Canadian government recently launched the Canadian Indicators Framework (CIF) for the Sustainable Development Goals Hub to provide data on Canada's progress toward domestic implementation for the SDGs.<sup>4</sup>

### 2.3 Existing Regulations in the Maritime Industry to Support SDGs

This report examines how the Canadian maritime industry can contribute toward achieving the UN SDGs. Shipping plays a crucial role in the global economy and has far-reaching economic, societal, and environmental impacts. As such, many of the SDGs could be relevant to the industry.

In Canada, the maritime sector is regulated at the international level by the International Maritime Organization (IMO) and at the national level by Transport Canada. As a result of these regulations, maritime operators already comply with standards relevant to several SDGs. This research seeks to determine which SDGs are most relevant to shipping and where the maritime industry is currently reporting using SDGs.

Much of international shipping law is established by the IMO, including safety, security, pollution prevention, and trade facilitation.<sup>5</sup> These regulations and conventions apply to ships of every IMO Member State for a base level of compliance on many environmental measures that contribute to the achievement of SDGs. Within Canada, international regulations are enacted and enforced through national regulation, primarily the Canada Shipping Act, 2001, which includes regulations to address safety, security, and pollution prevention in Canadian waters.

By following these regulations, the Canadian maritime industry contributes to many SDG targets in all three categories - biosphere, society, and economy. The mapping tool provided in this study can be used to complete a more detailed analysis of exactly how industry regulations relate to the SDGs.<sup>6</sup>

To learn more about shipping regulations in Canada, refer to the Clear Seas report: [Demystifying Maritime Governance](#).

### 2.4 Approach to Environmental and Sustainability Reporting in Canada

Many different structures are used by companies in Canada to evaluate and report on their environmental and sustainability practices, which can make it difficult to compare organizations, both within Canada and outside. Mapping these practices to the UN SDGs, a widely recognized international framework, may support standardized reporting on environmental and sustainability efforts.

#### 2.4.1 Overview of Common Reporting Methods

Sustainability reporting methods vary widely across the Canadian maritime industry. This section describes some of the more common environmental standards, certifications, and frameworks used. In

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<sup>4</sup> Government of Canada. (n.d.) *Global Indicator Framework for the Sustainable Development Goals Data Hub*. Statistics Canada. Retrieved January 15, 2024, from <https://www144.statcan.gc.ca/sdg-odd/index-eng.htm>

<sup>5</sup> Clear Seas. (2022). *Demystifying maritime governance: A primer on the governance of shipping with a focus on Canada*. Retrieved on July 24, 2024, from <https://clearseas.org/wp-content/uploads/2022-Clear-Seas-Demystifying-Maritime-Governance-2.pdf>

<sup>6</sup> Clear Seas. (2022).

conducting research for this report, each of these reporting methods was encountered in at least one industry report.

### **Environment, Society, and Governance (ESG) Frameworks**

ESG frameworks are guidelines, metrics, and criteria used by companies to develop sustainability reporting standards and evaluate environmental, social, and governance risks. While these frameworks are often referred to in industry reporting, there is no standardized method to measure ESG, and companies will usually interpret and apply these frameworks in different ways, often developing their own key performance indicators (KPIs).<sup>7</sup> Some ESG frameworks include the Global Reporting Initiative (GRI), Carbon Disclosure Project (CDP), and Task Force on Climate-Related Financial Disclosures (TCFD).

### **ISO 14001**

Developed by the International Organization for Standardization (ISO), the ISO 14001 environmental standard sets out the criteria for environmental management systems (EMS) within organizations.<sup>8</sup> It provides a framework for organizations to design and implement an EMS, which encompasses a range of areas from resource usage to waste management to monitoring environmental performance.

In the marine shipping industry, classification societies – independent organizations responsible for applying technical shipbuilding standards, for monitoring maintenance activities, and for conducting compliance inspections – can issue the ISO 14001 certification to shipping companies that meet the eligibility criteria.

### **Quality, Health, Safety, and Environment (QHSE) Management Systems**

QHSE management systems provide a framework for balancing a company's progress in these four areas. QHSE pertains to a set of guidelines, policies, and procedures designed to ensure that a company's operations comply with relevant laws and regulations, meet industry standards, and minimize negative impacts on people and the environment.<sup>9</sup> Development of a QHSE management system is usually left to the individual company and may build on international standards, including ISO 14001 (EMS), ISO 45001 (occupational health and safety), and ISO 9001 (quality management).

### **Global Reporting Initiative (GRI)**

The GRI provides sustainability reporting standards for impacts on the environment, economy, and people. The standards are a modular system comprised of three series of standards to be used together: universal standards, sector standards, and topic standards.<sup>10</sup> These standards can be incorporated into companies' ESG reporting.

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<sup>7</sup> Government of Canada. (2023). *Overview of Environmental, Social, and Governance (ESG)*. Canada Energy Regulator. Retrieved August 1, 2024, from <https://www.cer-rec.gc.ca/en/about/publications-reports/canada-energy-regulator-esg/canada-energy-regulator-esg-overview.html#:~:text=ESG%20refers%20to%20environmental%2C%20social,and%20opportunities%20of%20an%20investment>

<sup>8</sup> International Organization for Standardization. (2021). *ISO 14001:2015 Environmental management systems – Requirements with guidance for use*. Retrieved on August 1, 2024, from <https://www.iso.org/standard/60857.html>

<sup>9</sup> EcoOnline. (n.d.). *What is Quality, Health, Safety, and Environment (QHSE)?*. Retrieved on August 1, 2024, from <https://www.ecoonline.com/glossary/quality-health-safety-and-environment>

<sup>10</sup> Global Reporting Initiative. (n.d.). *How to Use GRI Standards*. Retrieved on August 1, 2024, from <https://www.globalreporting.org/how-to-use-the-gri-standards/>

## Sustainability Accounting Standards Board (SASB)

The SASB creates and maintains industry-specific standards that guide companies' disclosure of financial information related to sustainability efforts to investors and other stakeholders.<sup>11</sup> SASB are sometimes incorporated into companies' ESG reporting.

## Other Environmental Certifications

The maritime sector has created several environmental certifications, programs, and other efforts<sup>12</sup>, including:

- **Clean Cargo:** collaborative partnership between ocean container carriers, freight forwarders, and cargo owners supporting the decarbonization of containerized ocean cargo transport.
- **Clean Shipping Index (CSI):** led by Det Norske Veritas (DNV), a voluntary label for ships and shipping companies that provides market incentives for clean shipping.
- **Environmental Ship Index (ESI):** index that identifies seagoing ships that achieve a higher standard in reducing air emissions than required by the current emission standards of the IMO.
- **Green Award:** voluntary quality assessment certification scheme that inspects and certifies both seagoing and inland ships.
- **Green Marine:** non-profit organization that runs the leading voluntary environmental certification program for the maritime industry (see section 2.4.2).
- **RightShip:** ESG-focused maritime platform that helps maritime industry stakeholders drive operational improvements and safety standards.

You can learn more about environmental efforts in the Canadian maritime industry [here](#).

### 2.4.2 Green Marine Certification

The research described in this report includes work to map [Green Marine](#)'s performance indicators to the SDGs. The certification encourages participants to improve environmental performance in exceedance of regulations. The program has sector-specific performance indicators for shipowners and operators, ports, seaway corporations, terminals, and shipyard operators (see Figure 5). Continuous improvement is assessed annually on a scale of 1 (regulatory compliance) to 5 (excellence and leadership). Results are externally audited every two years.<sup>13</sup>

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<sup>11</sup> Sustainability Accounting Standards Board. (2023). *SASB Standards overview*. Retrieved on August 1, 2024, from <https://sasb.ifrs.org/standards/>

<sup>12</sup> Clear Seas. 2020. *Environmental Certifications: Towards a More Responsible Marine Shipping Industry*. Retrieved August 1, 2024, from <https://clearseas.org/insights/environmental-certifications-towards-a-more-responsible-marine-shipping-industry/>

<sup>13</sup> Green Marine. 2023. *Certification*. Retrieved on August 1, 2024, from <https://green-marine.org/certification/>

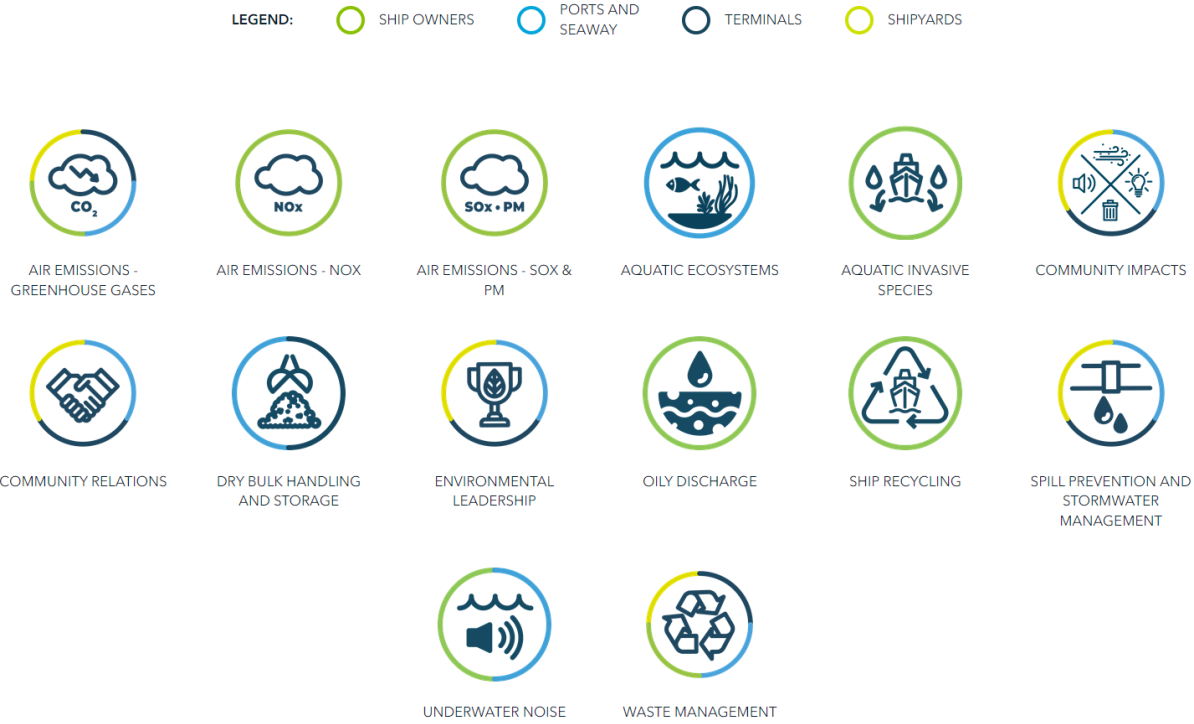


Figure 5. Overview of Green Marine Performance Indicators (source: [Green Marine](#))

While the SDGs consider sustainable development under the three categories of biosphere, society, and economy, Green Marine’s certification focuses on environmental measures. Thus, in mapping the Green Marine performance indicators to the SDGs, it was expected that Green Marine certification would most strongly correlate to the biosphere goals (#6, 13, 14, 15).

### 2.4.3 SDGs Relevance as Universal Reporting Language

Given the wide diversity of reporting methods used, the SDGs are increasingly being used as a universal, internationally recognized framework to compare reporting methods. Achieving progress in sustainable development will take effort at many different levels. Integrating the SDGs into business reporting helps ensure that companies are familiar with the goals and actively consider how their work can contribute.<sup>14</sup> While other reporting methods, such as ESG, are widely used, the implementation is not standardized among companies or across industries. The detailed SDG targets provide a clear measure of success and allow for uniformity between reports. They also represent internationally determined priority areas, which helps synchronize efforts across countries and industries to maximize impact.

<sup>14</sup> United Nations Global Compact. (n.d.). *Reporting on the SDGs*. Retrieved on August 1, 2024, from <https://unglobalcompact.org/take-action/action-platforms/sdg-reporting>

## 3.0 Methods (Part 1) - SDGs Mapping Tool

Part 1 of the research required first identifying SDGs and related targets that were most relevant to the maritime industry. Next, a tool to map maritime industry initiatives to SDGs was developed. This tool was applied to connect SDGs to Green Marine performance indicators.

### 3.1 Determine SDGs Relevant to Maritime Industry

First, SDGs with the highest relevance for the maritime industry to make an impact were identified. Second, specific targets under each SDG that are relevant to the maritime industry were identified.

#### 3.1.1 Categorize SDGs by Relevance

In 2017, the Norwegian Shipowners' Association commissioned a study carried out by DNV to evaluate opportunities for the maritime industry to contribute across the 17 SDGs and their related targets.<sup>15</sup> This analysis measured the type of effect (1 = indirect, 2 = moderately direct, 3 = very direct) and the magnitude of the effect (1 = low effect, 2 = medium effect, 3 = high effect) for each of the 17 SDGs for the maritime industry.




The results yielded three categories of SDGs by relevance to the maritime industry. Scores for type of effect (1-3) and magnitude of effect (1-3) were combined to create an overall score. SDGs with a score of 5/6 or 6/6 were categorized as "high potential". SDGs that were "moderately direct" and had a "medium effect" (4/6) were categorized as "medium potential." SDGs that were only "indirectly related" were categorized as "low potential".

Results showed that eight SDGs (#3, 7, 8, 11, 12, 13, 14, 15), shown in Table 1, offered high relevance for meaningful contributions from the maritime industry to the SDGs. Of these eight, three were categorized as biosphere (#13, 14, 15), three were categorized as society (#3, 7, 11), and two were categorized as economy (#8, 12).

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<sup>15</sup> DNV & Norwegian Shipowner's Association. (2017). Sustainable Development Goals: Exploring maritime opportunities. Retrieved on January 15, 2024, from <https://www.rederi.no/globalassets/dokumenter-en/all/fagomrader/smi/dnv-gl-sdg-maritime-report.pdf>

**Table 1. SDGs by Relevance for Maritime Industry Contribution**

<p><b>Category #1 – High Potential</b></p> <p>The SDGs identified with the most relevance to the maritime industry:</p> 							
<p><b>Category #2 – Medium Potential</b></p> <p>The SDGs identified with some relevance to the maritime industry. Some of these SDGs could be advanced within the maritime industry globally, without making a significant contribution toward Canada’s targets. For example, the industry could support Goal #5 – Gender Equality by recruiting more women seafarers.</p> 							
<p><b>Category #3 – Low Potential</b></p> <p>The SDGs with less relevance to the maritime industry. Due to the interlocking nature of the SDGs, it is possible to argue that the maritime industry could contribute to all 17 goals in some way, but these goals have limited relevance.</p> 							

**3.1.2 Code SDG Targets**

For each SDG, targets were selected by relevance to the maritime industry. Initial coding was taken from the DNV study which identified 51 of the 169 targets as relevant. This initial coding was supplemented by Clear Seas' internal review (five additional targets) and further informed by a review of the literature (five more targets added).<sup>16</sup> In total, 61 targets were considered relevant in this analysis and were used for mapping industry initiatives and Green Marine's performance indicators to SDGs.

While each SDG was found to have at least one relevant target, the maritime industry’s impact on each target varied. The targets under highly relevant SDGs are more directly linked to industry efforts than targets under medium or low relevance SDGs.<sup>17</sup>

<sup>16</sup> MacNeil, J. L., Adams, M., & Walker, T. R. (2021). Development of framework for improved sustainability in the Canadian port sector. *Sustainability*, 13, 11980. <https://doi.org/10.3390/su132111980>

<sup>17</sup> For example, for Goal #2 Zero Hunger, Target 2.1 "to end hunger and ensure access by all people... to safe, nutritious and sufficient food all year round" is relevant to the maritime industry, which transports over 1 billion tonnes of food globally per year, but depends on many other factors beyond the industry's control.

## 3.2 Map Green Marine Performance Indicators to SDG Targets

The coding to identify SDG targets relevant to the maritime industry yielded a tool that can be used to map these indicators to other reporting metrics and industry initiatives. Applying this tool to map SDGs to Green Marine performance indicators tested it and identified how organizations certified by Green Marine are contributing to SDG achievement.

### 3.2.1 Create Matrix for Mapping Activity

Building on the coding work, an Excel template was designed to be used as a tool for mapping SDG targets to maritime industry initiatives and other environmental reporting methods.

The template includes a column for each SDG, a column of targets relevant to the maritime industry, and a column where initiatives can be recorded for each target. The tool can also be turned into a matrix by adding more columns with categories.

The mapping tool template with instructions is [downloadable here](#).

### 3.2.2 Map Targets to Green Marine Performance Indicators

The next step in the analysis used the tool to map SDG targets to Green Marine performance indicators.

The 14 Green Marine performance indicators were split into two categories for this mapping analysis: 1) shipowners and operators; and 2) ports, seaway corporations, terminal and shipyard operators with some indicators in both categories, as shown in Table 2.

**Table 2. Overview of Green Marine Performance Indicators for Shipowners and Landside Operations**

Shipowners / Operators	Ports, Seaway Corporations, Terminal and Shipyard Operators
Aquatic Invasive Species	Air Emissions – GHG
Air Emissions – GHG	Spill Prevention & Stormwater Management
Air Emissions – SO <sub>x</sub> & PMs	Community Impacts
Air Emission – NO <sub>x</sub>	Community Relations
Oily Discharge	Environmental Leadership
Waste Management	Waste Management
Underwater Noise (saltwater transits only)	Underwater Noise (saltwater ports only)
Ship Recycling	Aquatic Ecosystems (ports only)
	Dry Bulk Handling & Storage (ports and terminals)

Green Marine used the tool to create a matrix with SDG targets on one axis and Green Marine performance indicators on the other axis. Each performance indicator was coded as directly related, indirectly related, or not related to each SDG target, as described in Section 3.1.2.



## 4.0 Methods (Part 2) - Content Analysis of Industry Reports

### 4.1 Determine Maritime Industry Scope for Study

The scope of this study was limited to the maritime industry in Canada and focused on four sectors: shipowners, port authorities, shipyards, and terminal operators. International shipowners were classified as operating in Canada if they had at least one office in Canada. Other areas of marine activity, notably fishing, were not considered. Other entities beyond the scope of this study included pilotages, ferries, tugs & barges, cruise ships, and fleets with fewer than three vessels.

These inclusion and exclusion criteria guided a systematic search of all relevant industry players operating in Canada under the four main sectors. The final list included 16 shipowners (13 are Green Marine certified), 17 port authorities (all 17 are Green Marine certified), 17 shipyards (8 are Green Marine certified), and 33 terminal operators (27 were Green Marine certified).

### 4.2 Compile Library of Industry Reports

A library of industry reports published by the various Canadian maritime industry players was compiled. Reports examined included organizations' annual reports and/or sustainability reports as applicable. Reports were indexed and saved in a Zotero library sorted by the four main industry sectors. If no reports were published, a link to the organization's sustainability initiatives was added, if available. Data collection for this study concluded in January 2024 and reflects the most recent industry reports available as of that date.

### 4.3 Analyze Report Content for SDGs

The industry reports compiled were analyzed for content related to the SDGs. Information gathered included:

- Whether the report references the SDGs (yes/no)
- If yes, whether the report:
  - specifies which goals were contributed toward (yes/no)
  - relates goals to specific initiatives (yes/no)
  - names specific SDG targets (yes/no)

The analysis also took note of whether the organization had obtained certification from Green Marine, which would indicate contributions toward certain SDGs.

## 5.0 Results

The results of this study are organized into two sections: mapping the SDGs to the Green Marine performance indicators and content analysis of industry reports.

### 5.1 Mapping Green Marine Performance Indicators

The analysis shows that the Green Marine certification contributes to targets for 11 out of the 17 SDGs. Of the 61 SDG targets identified as relevant to the maritime industry (see section 3.1.2), Performance Indicators associated with a Green Marine certification contribute to 25 of them. In total, the Green Marine certification program is directly linked (by at least one target) to 9 SDGs and indirectly linked to 2 SDGs.

The Green Marine performance indicator directly linked to the most SDGs was Air Emissions – GHG with directly linked targets for seven SDGs, followed by Aquatic Ecosystems, with directly linked targets for five SDGs (see Figure 6).

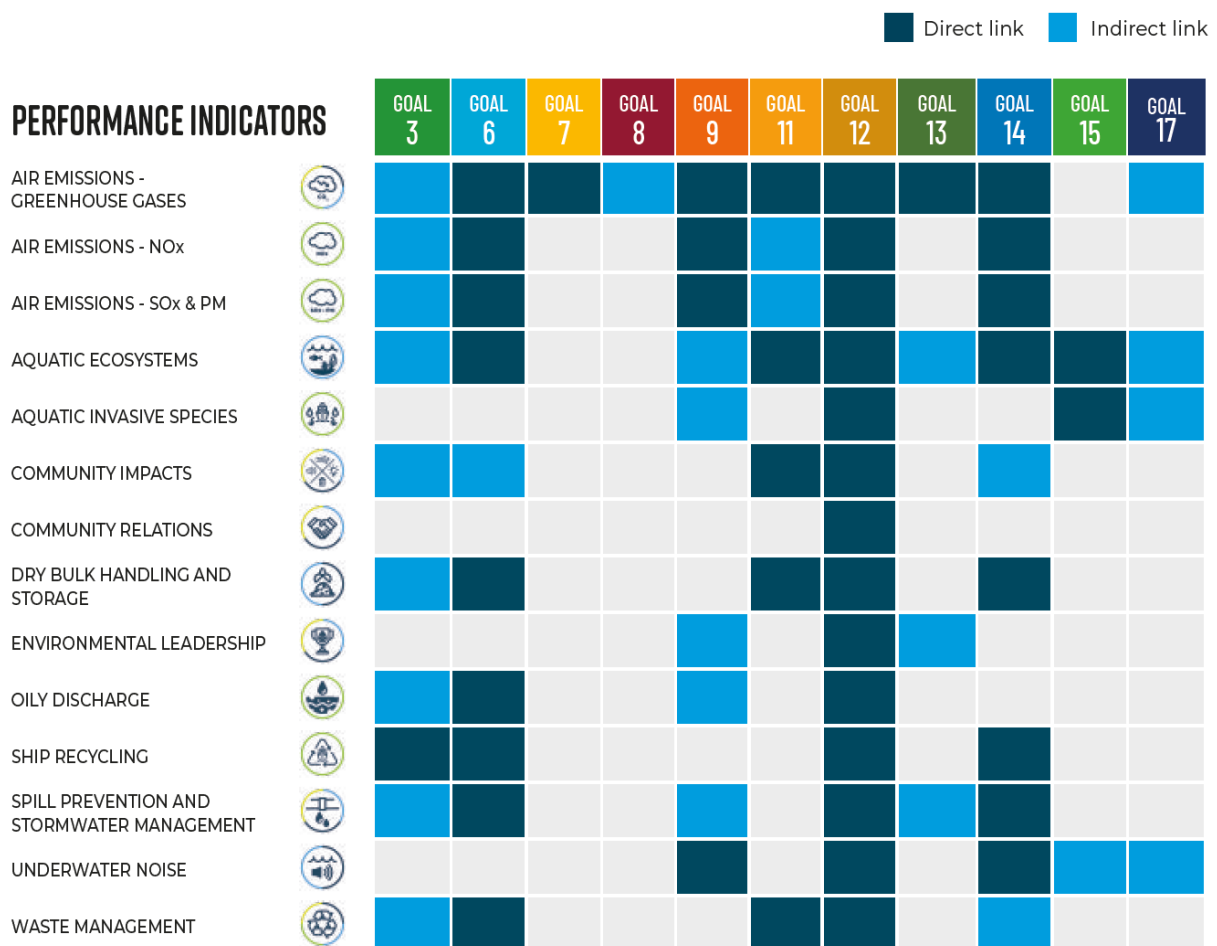


Figure 6. Direct and Indirect Links Between SDGs and Green Marine Performance Indicators

The graph in Figure 7 shows the number of targets under each SDG that are relevant to the maritime industry and to Green Marine specifically (direct and indirect). In interpreting this graph, it is important to note the total number of targets under each SDG because some SDGs have many more targets than others.

As anticipated, Green Marine certification is linked to all of the four biosphere SDGs (Goals #6, 13, 14, 15), and also to some of the economy SDGs (Goals #8, 9, 12) and society SDGs (Goals #3, 7, 11). All of the SDGs identified as “high potential” for the maritime industry are also linked to Green Marine certification (Goals #3, 7, 8, 11, 12, 13, 14, 15). The two “low potential” SDGs (Goals #1, 10) are not linked to Green Marine certification.

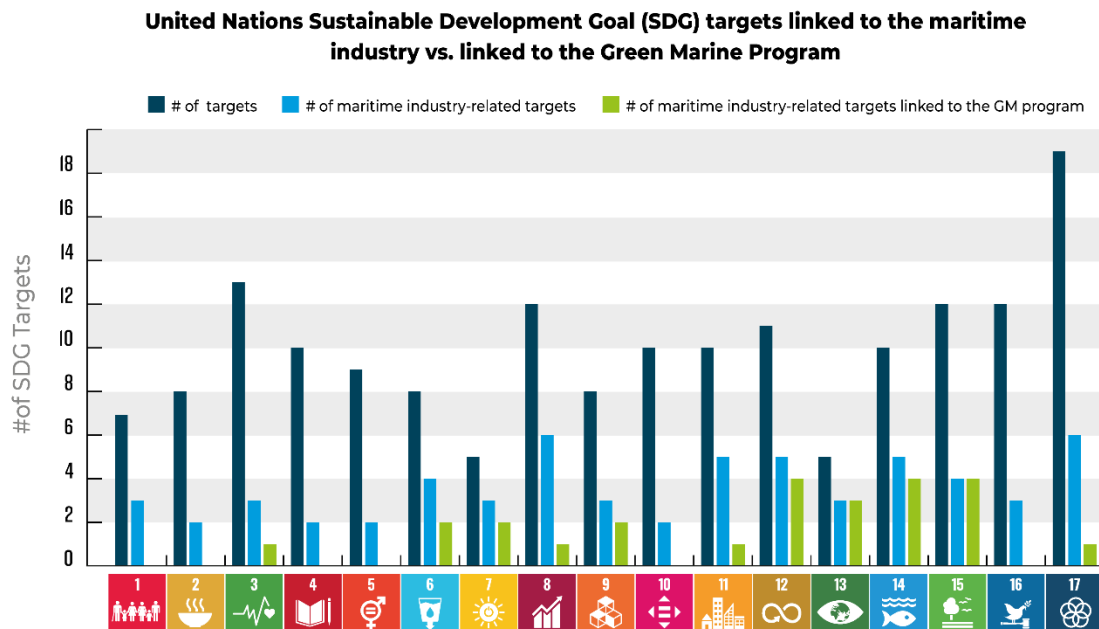


Figure 7. SDG Targets: In total, relevant to the maritime industry, relevant to Green Marine

## 5.2 Content Analysis

### 5.2.1 SDG Content in Industry Reports

The content analysis of Canadian maritime industry reports shows the number of organizations using SDGs in their reporting as of January 2024. Results are divided between the four industry sectors that are the focus of this study: shipowners and operators, port authorities, shipyards, and terminal operators, shown in Table 3.

**Table 3. SDG Content Analysis of Industry Reports**

	Shipowners	Port Authorities	Shipyards	Terminal Operators	Total
Total # in study	16	17	17	34	84
# with report	13 (81%)	10 (59%)	1 (6%)	8 (24%)	32 (38%)
# reports mention SDGs	12 (92%)	5 (50%)	1 (100%)	4 (50%)	22 (68%)
# reports specify which SDGs	11 (85%)	4 (40%)	1 (100%)	3 (38%)	19 (59%)
# reports map SDGs to organization initiatives	6 (46%)	3 (30%)	0	2 (25%)	11 (34%)
# reports reference specific SDG targets	2 (15%)	1 (10%)	0	1 (13%)	4 (12.5%)

Of the four industry sectors, shipowners were most likely to have a report available (81% of shipowners) and to make reference to the SDGs (92% of reports). Port Authorities had the second largest proportion with a report (59%), of which 80% mentioned the SDGs. Just under a quarter of terminal operators had a report and only half of these reports mentioned the SDGs.

The shipyards had to be excluded from much of the content analysis because only 1 out of 17 shipyards had a report. The one report available did mention specific SDGs, though it did not map the SDGs to company initiatives or link to specific targets.

While all four industry sectors had at least one report that mentioned the SDGs, and many of them mentioned specific SDGs, there were fewer reports that mapped the SDGs to organization initiatives (46% for shipowners, 30% for Port Authorities, 25% for terminal operators) and fewer still that referred to specific SDG targets (15% for shipowners, 10% for Port Authorities, and 13% for terminal operators).

### 5.2.2 SDGs Most Identified

The content analysis of the industry reports revealed where organizations were reporting the most effort and impact toward the SDGs. The SDGs that were most often reported were not always those that had been identified as “high potential” for relevance.

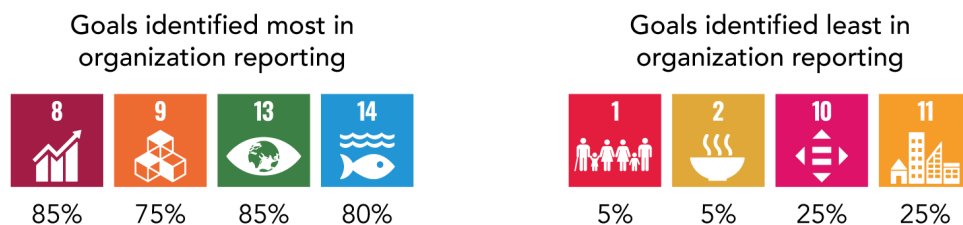
**Table 4. Percentage of Reports that Mention Each SDG**

Category <sup>18</sup>	Relevance	SDG	% of all Reports	% Shipowners	% Port Authorities	% Terminal Operators
Biosphere	Medium	Goal 6 – Clean Water and Sanitation	40	50	25	33
	<b>High</b>	<b>Goal 13 – Climate Action</b>	<b>85</b>	<b>92</b>	<b>75</b>	<b>100</b>
	<b>High</b>	<b>Goal 14 – Life Below Water</b>	<b>80</b>	<b>75</b>	<b>75</b>	<b>100</b>
	<b>High</b>	<b>Goal 15 – Life On Land</b>	<b>40</b>	<b>20</b>	<b>76</b>	<b>67</b>
Society	Low	Goal 1 – No Poverty	5	8	0	0
	Medium	Goal 2 – Zero Hunger	5	0	25	0
	<b>High</b>	<b>Goal 3 – Good Health and Well-Being</b>	<b>45</b>	<b>50</b>	<b>75</b>	<b>0</b>
	Medium	Goal 4 – Quality Education	45	50	25	0
	Medium	Goal 5 – Gender Equality	50	58	25	67
	<b>High</b>	<b>Goal 7 – Affordable and Clean Energy</b>	<b>30</b>	<b>33</b>	<b>25</b>	<b>33</b>
	<b>High</b>	<b>Goal 11 – Sustainable Cities and Communities</b>	<b>25</b>	<b>17</b>	<b>50</b>	<b>33</b>
Medium	Goal 16 – Peace, Justice, and Strong Institutions	35	50	25	0	
Economy	<b>High</b>	<b>Goal 8 – Decent Work and Economic Growth</b>	<b>85</b>	<b>83</b>	<b>100</b>	<b>100</b>
	Medium	Goal 9 – Industry, Innovation, and Infrastructure	75	75	75	100
	Low	Goal 10 – Reduced Inequalities	25	33	0	33
	<b>High</b>	<b>Goal 12 – Responsible Consumption and Production</b>	<b>65</b>	<b>67</b>	<b>75</b>	<b>67</b>
General	Medium	Goal 17 – Partnerships	50	67	25	33
<b>Total # reports that identify SDGs</b>			<b>20</b>	<b>12</b>	<b>4</b>	<b>3</b>

**\*High relevance SDGs in bold**

\*Shipyards were excluded from the analysis due to lack of publicly available data.

<sup>18</sup> These categories refer to the framework developed by the Stockholm Resilience Institute (Folke et al., 2016). See Section 2.1 for more details.



The four SDGs most frequently identified in maritime industry reporting included two goals from the biosphere category (Goals #13 and 14), both of which are ranked as “high potential” for relevance to the maritime industry, and two goals from the economy category (Goals #8 and 9), of which Goal #8 is ranked as “high potential” and Goal #9 is ranked as “medium potential.”

The four SDGs least identified in maritime industry reporting included three goals from the society category (Goals #1, 2, 11) and one goal from the economy category (Goal #10). Goals #1 and 10 are ranked as “low potential” for relevance to the maritime industry, while Goal #2 is ranked as “medium potential” and Goal #11 is ranked as “high potential.”

Four SDGs ranked as “high potential” for the maritime industry but were mentioned in fewer than 50% of reports:

- SDG #7 Clean Energy – mentioned in 30% of reports
- SDG #3 Good Health – mentioned in 45% of reports
- SDG #11 Sustainable Cities – mentioned in 25% of reports
- SDG #15 Life on Land – mentioned in 40% of reports

## 6.0 Discussion

This report provides clarity on how the Canadian maritime industry contributes to the UN SDGs and includes a tool that organizations can use to map their initiatives to the SDGs. While some organizations are already referencing SDGs in their reporting, many are not. This presents an opportunity for more consistent reporting and more meaningful analysis.

### 6.1 State of Reporting Using SDGs

Many Canadian maritime industry players mentioned the SDGs in their reporting; however, fewer of them included an in-depth analysis. The majority of organizations included in the study used SDGs as general themes in reporting without mapping to specific targets. Of the four categories of industry players (shipowners and operators, port authorities, shipyards, and terminal operators), shipowners were more likely to have sustainability reports compared to port authorities and terminal operators. Only one shipyard had published a report. Most shipowners included are larger organizations, and sometimes international, with more resources. Interestingly, while almost none of the shipyards and terminal operators mentioned the SDGs, several of their websites included initiatives that apply to many of the SDGs. The information currently available in reports does not fully capture the Canadian maritime industry's contributions toward achieving the SDGs.

Of the reports that did include SDGs, it was interesting to see which SDGs they mentioned. Some of the SDGs that ranked as “high potential” for the maritime industry were not mentioned in most reports. One example is SDG #11 – Sustainable Cities and Communities, which only appeared in 25% of reports.

## 6.2 Study Limitations

This study relied on publicly accessible reporting and data, collected between July 2023 and January 2024. It remains possible that some industry organizations have applied the SDGs internally or intend to include them in future reports, but this knowledge was beyond the scope of this study.

The categorization of SDGs into low, medium, and high potential focused on the maritime industry as a whole rather than specializing for each industry category. This limitation reflects the fact that the SDGs were meant to be universal and not designed for any specific industry.

As with any study of this nature, there was risk of subjectivity in coding the SDG targets and Green Marine performance indicators. This risk was minimized by building on work presented in past studies on the SDGs in the maritime industry<sup>19,20</sup> and conferring with multiple Green Marine staff members to confirm the Green Marine coding before validating with Clear Seas staff.

## 6.3 Future Directions

In future, the tool can be applied to map the SDGs to other environmental reporting methods in Canada. Individual organizations can employ the tool to help map their own initiatives, either internally or for reporting purposes. An area for further research would be to update the content analysis of industry reports sometime before 2030 to see how companies' reporting on the SDGs has changed and what progress has been made toward achieving the SDGs.

## 6.4 Industry Mapping Tool

SDGs are becoming an increasingly common metric to include in sustainability reports, but thus far there is a lack of standardization in how they are included. Many organizations refer to the SDGs as broad themes without linking to specific targets. By mapping industry initiatives to SDG targets, organizations can increase transparency in their reporting and go beyond adding an SDG logo to their report. The mapping tool and associated Excel template provided in this report can be used for in-depth SDG analysis of any organization's work and also be applied to any program or used to map to any other reporting methods, as shown with Green Marine's Performance Indicators.

[Download the mapping tool here.](#)

## 6.5 Progress toward Achieving the SDGs

All maritime industry players operating in Canada are already making contributions toward many of the SDGs by following mandatory domestic and international regulations. Beyond this, organizations with

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<sup>19</sup> MacNeil et al. (2021)

<sup>20</sup> DNV & Norwegian Shipowners' Association (2017)

Green Marine certification can contribute to 11 out of the 17 SDGs by participation in the certification program, which requires the implementation of measures that exceed regulatory requirements and encourages continual improvement. The higher the certification level an organization achieves in each Green Marine performance indicator, the greater that organization's contribution to the SDGs.

This analysis identified that many organizations that did not explicitly report on SDGs still had initiatives underway that were contributing to the SDGs. This distinction suggests that the Canadian maritime industry's overall contributions toward achieving the SDGs are more significant than reflected in publicly available reports. For a full picture of the industry's progress, more mapping would be needed to connect the initiatives of every organization in the database to the SDG targets. As more organizations undertake mapping exercises, more data to demonstrate the industry's SDG progress will be available.

## 7.0 Conclusion

The UN SDGs are increasingly used in industry reporting in Canada, though how they are incorporated varies greatly. This research examined how the Canadian maritime industry is currently reporting on the SDGs and proposed a tool for mapping maritime industry initiatives to specific SDG targets. This mapping tool provides industry players with a template and clear metrics for capturing their progress toward the SDGs and planning future initiatives. This tool was tested by mapping the Green Marine performance indicators to SDG targets. The results show how the Green Marine certification contributes toward 11 of the 17 SDGs. This process could be replicated with other environmental reporting methods within Canada and beyond.

### 7.1 Findings

Some of the SDGs have more relevance to the maritime industry than others.

Eight SDGs have a high relevance for maritime industry contributions:

- Goal #3 Good Health and Well-being
- Goal #7 Affordable and Clean Energy
- Goal #8 Decent Work and Economic Growth
- Goal #11 Sustainable Cities and Communities
- Goal #12 Responsible Consumption and Production
- Goal #13 Climate Action
- Goal #14 Life Below Water
- Goal #15 Life on Land

Out of the total 169 SDG targets, just over one-third (61) are relevant to the maritime industry. Each goal has at least one relevant target, though some are more directly related to the maritime industry than others.

The Green Marine certification contributes to 11 out of 17 SDGs. As an environmental certification program, it was expected that Green Marine would contribute to certain SDGs (i.e., biosphere-related SDGs) more than others (i.e., economic SDGs). Green Marine participants automatically contribute to these SDGs through their certification and can refer to this report for detailed documentation on which



SDGs they contribute to. This information will support future sustainability reporting for many industry players. For example, the majority of terminal operators included in this study that did not publish reports were Green Marine certified. Almost half of Canadian shipyards included in this study are Green Marine-certified, but only one shipyard had published a report.

Shipowners and operators are the industry sector most often referring to SDGs in reporting, followed by port authorities. Of those reporting on SDGs, just over half were mapping SDGs to specific organizational initiatives, and less than a quarter had related their efforts to specific SDG targets.

## 7.2 Recommendations

Incorporating SDGs into maritime industry reporting is a useful way to measure an organization's progress on sustainability with a framework that is globally recognized.

Mapping an organization's initiatives to specific SDG targets represents the gold standard for incorporating SDGs into their reporting. It provides the most transparency, serves as a useful quantitative measure across organizations, and gives a clear picture of where and how they are contributing.

Focusing on high-impact SDGs and relevant targets may yield better results for maritime industry players than trying to address all the SDGs equally. The results of this analysis suggest that more attention could be given to Goal #7 – Clean Energy, Goal #3 – Good Health and Well-Being, Goal #11 – Sustainable Cities and Communities, and Goal #15 – Life on Land. These four SDGs were ranked as having high relevance to the maritime industry but were mentioned in a minority of industry SDG reports.

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