# POSEIDON PRINCIPLES

## FOR MARINE INSURANCE

A global framework for responsible marine insurance

Version 1.0
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**Poseidon Principles**
Amaliegade 33 B, 3rd floor
1256 Copenhagen K
Denmark

www.poseidonprinciples.org
info@poseidonprinciples.org

# Cover letter

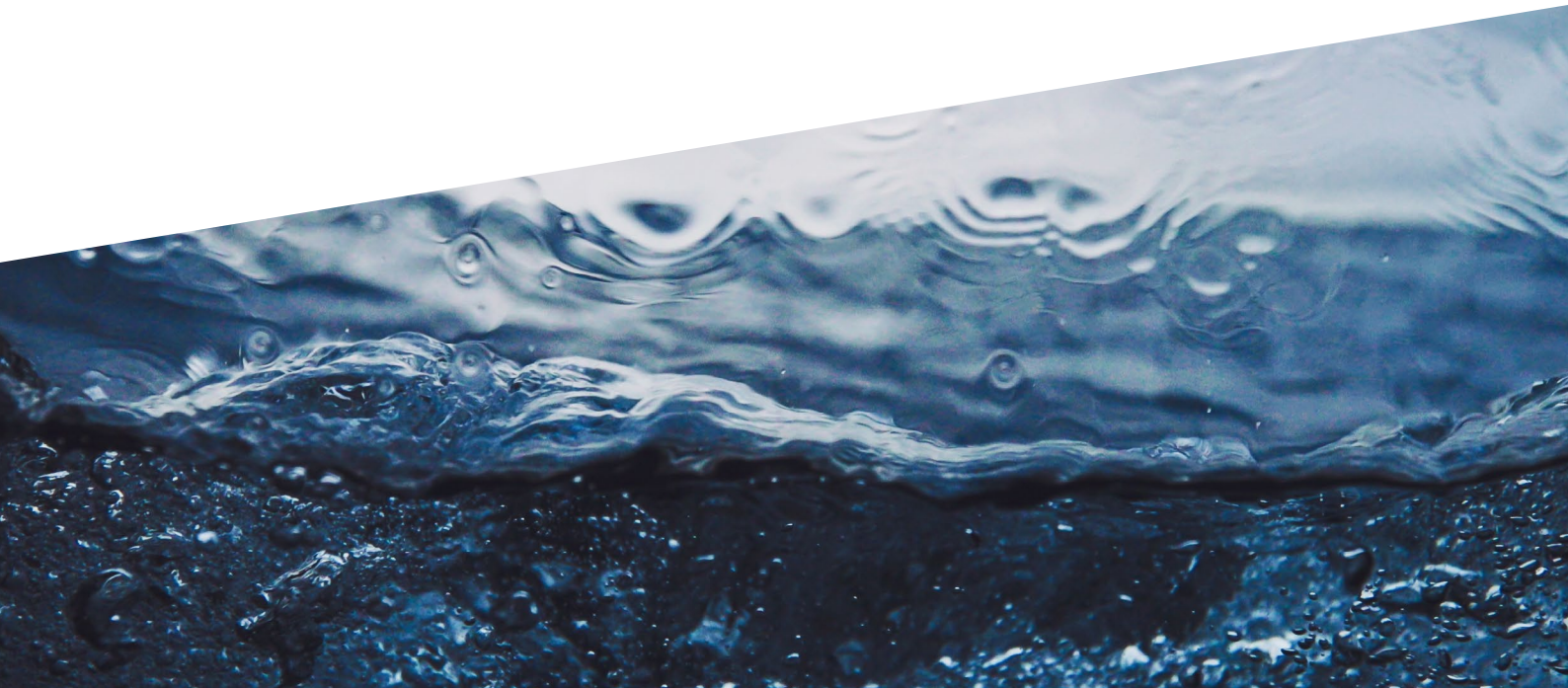
As Signatories and members of this drafting group, we are proud to announce our commitment to assess and improve transparency on the environmental impacts of global seaborne trade.

Inspired by the launch of the Poseidon Principles in June 2019, and the Sea Cargo Charter in October 2020, the Poseidon Principles for Marine Insurance were developed in recognition of our role as insurance providers in promoting responsible environmental stewardship throughout the maritime value chain. We believe that industry-wide change is possible when we all take responsibility for contributing to meeting the greater goals of the society that we serve.

The Poseidon Principles for Marine Insurance are consistent with the policies and ambitions of the International Maritime Organization (IMO), including its ambition for greenhouse gas (GHG) emissions to peak as soon as possible and to reduce shipping's total annual GHG emissions by at least 50% by 2050 compared to 2008. We have also chosen to take steps towards measuring portfolio alignment with the Paris Agreement, to achieve net-zero emissions by 2050, and to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

This makes marine insurance the first line of business to establish a sector-specific methodology to support the ambition of the United Nations-convened Net-Zero Insurance Alliance (NZIA). A trajectory in line with net-zero commitments by 2050, including those established by NZIA, will be introduced once available (e.g. from the Science Based Targets initiative). The trajectories will be reviewed and improved over time to maintain the robust nature of the initiative and remain in step with the demands of our society.

The Principles support the transition of global shipping, as well as the work of the NZIA and the Partnership for Carbon Accounting Financials (PCAF). As such, the Principles set a pioneering framework for reporting emissions for the shipping industry, thus enhancing accountability and transparency and creating a global baseline to support and work towards the greater goals for our society and the goal to align our maritime activities so that they are environmentally responsible.



The Poseidon Principles for Marine Insurance are applicable to underwriters and insurers who provide marine vessel Hull & Machinery coverage, and is supported by our insurance brokers and our business partners. They apply globally to all shipping activities where a vessel or vessels fall under the purview of the IMO.Currently, climate alignment is the only factor considered by the Poseidon Principles for Marine Insurance. We recognize that they are intended to evolve over time and agree to contribute to a review process to ensure that the Principles are practical and effective, aligned with the goals set by society and that further adverse impacts are identified for inclusion in due course. While the Principles establish a methodology for measuring emissions within the shipping industry, we recognize that some Signatories may wish to go beyond this through their net-zero commitments (as insurers within the NZIA), and we encourage their public disclosure through this framework.

As Signatories, we commit to implementing the Poseidon Principles for Marine Insurance in our internal policies, procedures and standards, and to work in partnership with our business partners on an ongoing basis to implement the Principles. As Affiliate members, we commit to supporting the Poseidon Principles for Marine Insurance. This will not only serve our institutions to improve decision-making at a strategic level, but will also support a better future for the shipping industry and our society.

We believe that now is the time to act on this initiative, and we invite you to join us.

**December 2021**

**Patrizia Kern**

Marine Head,
Swiss Re Corporate Solutions

Chair of the drafting group

**Rolf Thore Roppestad**

Chief Executive Officer,
Gard

Vice chair of the drafting group

# Preamble

The maritime sector has provided efficient economic services that have played a key role in enabling the growth of global trade and global economic development. However, this has not been without some adverse consequences unique to the maritime sector. The continued success of the maritime sector is intrinsically linked to the well-being and prosperity of the society we serve. Therefore, all industry participants must play a role in addressing adverse impacts. Financial institutions took the first step in June 2019 with the establishment of the Poseidon Principles; in October 2020, charterers took the next step with the Sea Cargo Charter. We fully support these initiatives and wish to join our colleagues in increasing transparency across the maritime sector.

We recognize that our role in the industry affords us opportunities to promote responsible environmental stewardship throughout the maritime value chain. Thus, we have established the Poseidon Principles for Marine Insurance, which serve as a framework for creating common, global baselines that are consistent with and supportive of society's goals. This will enable us to better align our portfolios with responsible environmental impacts.

The Poseidon Principles for Marine Insurance are consistent with the policies and ambitions of the International Maritime Organization (IMO), including its ambition for greenhouse gas (GHG) emissions to peak as soon as possible and to reduce shipping's total annual GHG emissions by at least 50% by 2050 compared to 2008. We have also chosen to take steps towards alignment with the Paris Agreement, to achieve net zero emissions by 2050, and to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. A trajectory in line with net-zero commitments by 2050, including the NZIA, will be introduced once available (e.g. from the Science Based Targets initiative). The trajectories will be reviewed and improved over time to maintain the robust nature of the initiative and remain in step with the demands of our society.

The Principles for Marine Insurance are aligned with the Poseidon Principles for Financial Institutions and the Sea Cargo Charter, and are also intended to support other initiatives, such as the Carbon Disclosure Project (CDP), the Task Force on Climate-related Financial Disclosure (TCFD), the Science Based Targets Initiative (SBTi), the Net Zero Insurance Alliance (NZIA) and UNEPFI Principles for Sustainable Insurance (UNEP PSI).

As Signatories, we commit to implementing the Poseidon Principles for Marine Insurance in our policies, procedures, and standards. We will work in partnership with our clients and partners on an ongoing basis to implement the Poseidon Principles for Marine Insurance. As Affiliate members, we commit to supporting the Signatories, and working with our partners and clients to improve transparency across our business activities.

Together, we welcome the establishment of global baselines through the methodology established in the Poseidon Principles, and recognize that some Signatories may choose to go beyond them. Signatories with net-zero commitments, as seen in the NZIA, are encouraged to disclose such commitments and use the framework to promote transparency. This offers significant benefits to us as Signatories, as Affiliate members, to the global maritime industry, and to society as a whole.

We recognize that the Poseidon Principles are intended to evolve over time as access to data and improved methods becomes available and agree to contribute to a review process when we as Signatories decide to undertake it. This process will ensure that the Poseidon Principles remain practical and effective, are linked to and supportive of society's goals, and that further adverse impacts are identified for inclusion.

# Scope

The Poseidon Principles for Marine Insurance must be applied by Signatories in all business activities (referred to as 'Business Activities' in this document) where:

1. The insurance products cover hull and machinery (H&M).
2. The Signatory is the leading insurer, as well as in cases where the Signatory is a follower, but the lead is also a fellow Signatory.
3. A vessel or vessels *which have an established Poseidon Principles trajectory whereby the carbon intensity can be measured with IMO Data Collection System (DCS) data*.[9]

Climate alignment is currently the only environmental factor considered by the Poseidon Principles for Marine Insurance. Climate alignment in this context refers to the degree to which a vessel, product, or portfolio's carbon intensity is in line with a specified decarbonization trajectory.

The scope will be reviewed and may be expanded by Signatories on a timeline that is at their discretion, with the support of Affiliate members. The scope of coverage, as well as additional environmental factors, can be added to this initiative over time.[10]

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9 *Where a vessel or vessels fall under the purview of the IMO and is required to submit data to the IMO DCS (ie vessels 5 000 GT and above, not solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly (MARPOL Annex VI, Chapter 4, Reg. 19).*

*Signatories are to use the ship type classification as submitted to the IMO DCS.*
*For clarification of classification of ship types or individual ships, please refer to:*

*(1) StatCode5 Ship Type Coding System* **document***, and*
*(2) IMO Global Integrated Shipping Information System (*GISIS*)*
*(3) If still in doubt, please contact the Secretariat*

10 *Furthermore, for Signatories who are also members of NZIA, the implementation of the Poseidon Principles for Marine Insurance support the aims, metrics and targets of the NZIA and its members. These include but are not limited to the NZIA's collaboration with the Partnership for Carbon Accounting Financials (PCAF) to develop a global, standardised methodology to measure and disclose the GHG emissions associated with insurance and reinsurance underwriting portfolios, and the NZIA's work to develop a target-setting protocol.*

# About the scope

As seen with the evolution of the voluntary efforts of private financial institutions leading to the launch of the Poseidon Principles, there has been a shift from avoiding the adverse climate and ecological impacts of business activities to becoming actively involved in driving solutions for the sector. The Poseidon Principles for Financial Institutions were the first sector-specific climate alignment framework for ship finance, just as Marine Insurance does the same by adapting the same methodology for the assessment and disclosure of climate alignment of their hull and machinery portfolios.

Hull and Machinery (H&M) represents the second largest part of marine insurance coverage (with Marine Cargo as the largest portion), which means that this first step offers the greatest coverage and potential for impact across Marine Insurance. In terms of data availability to measure carbon emissions, H&M offers a comparable starting point to the Poseidon Principles for Financial Institutions as a tangible first step to assess and disclose climate alignment.

The Poseidon Principles for Marine Insurance are the next step for the insurance sector to implement transparency and disclose the climate alignment of their portfolios, in order to assess the environmental and climate impact of their business decisions. For consistency across initiatives and simplicity for both insurance providers and shipowners, this initiative shares the methodological foundation with its predecessor, the Poseidon Principles for Financial Institutions, and establishes the same data requirements and information flow for Signatories and their clients to follow. By following the framework and common baseline, valuable asset- and policy-level climate alignment data is available for Signatories to better enable the alignment of their portfolios with responsible environmental impacts.

The Poseidon Principles for Marine Insurance aim to be voluntary, verifiable, clear and implementable. Assessment of the portfolio where a Signatory is a follower, and where the lead is not a Signatory, could create a burden on the Signatory to obtain the required data from a client. It is recommended that Signatories agree to work with clients to try to collect and process this information to the best of their ability. To support this process, it is recommended that Signatories include the wording provided in the Standard Clause – a process similar to the Standard Covenant Clause in the Poseidon Principles for Financial Institutions – to be used in agreements to obtain consent for data use. This is further elaborated in Section 3.

# PRINCIPLES OVERVIEW

Principle 1

## Assessment

> We will annually assess climate alignment in line with the Technical Guidance for all Business Activities.

**Our commitment:**

Signatories will, on an annual basis, measure the carbon intensity and assess climate alignment (carbon intensity relative to established decarbonization pathways) of their hull and machinery portfolio using the methodology established by the Poseidon Principles for Marine Insurance, in line with the Technical Guidance

# PRINCIPLES OVERVIEW

Principle 2

## Accountability

We recognize the important role that unbiased information plays in data collection and reporting fuel consumption from ships to meet the decarbonization goals of the sector. We will rely on trusted entities and mandatory regulations as explicitly identified in the Technical Guidance for the provision of information used to assess and disclose climate alignment.

**Our commitment:**

For each step of the assessment, Signatories will exclusively rely on the data types, data sources and service providers identified in the Technical Guidance.

# PRINCIPLES OVERVIEW

Principle 3

## Enforcement

> We will require that ongoing compliance with the Poseidon Principles for Marine Insurance is made contractual in all Business Activities using standardized covenant clauses. We will contribute to the update and addition of standardized clauses through the annual review process.

**Our commitment:**

Signatories will agree to work with shipowners, clients, brokers and business partners to collect and process the information necessary to calculate carbon intensity and to assess climate alignment.

# PRINCIPLES OVERVIEW

Principle 4

## Transparency

> We will publicly acknowledge that we are a Signatory to the Poseidon Principles for Marine Insurance, and we will publish the results of our assessment on an annual basis in line with the Technical Guidance.

**Our commitment:**

Climate alignment scores will be published on an annual basis.

1. Upon becoming a Signatory or Affiliate member, the member will publicly acknowledge that it is a Signatory to or Affiliate member of the Poseidon Principles for Marine Insurance.
2. On an annual basis, each Signatory will report the overall climate alignment of its shipping portfolio and supporting information, as per the Accountability requirements, to the Secretariat no later than 30 November. This requirement takes effect for each Signatory in the calendar year after the year in which it became a Signatory.
3. On an annual basis, each Signatory will publish the overall climate alignment of its shipping portfolio in relevant institutional reports on a timeline that is appropriate for that Signatory. This requirement takes effect for each Signatory in the calendar year after the calendar year in which it became a Signatory.

# Overview for Affiliate members

Under the current scope, the Poseidon Principles for Marine Insurance are applicable to insurers with H&M policies. However, we recognize that the ecosystem of key players extends beyond this limit, and the framework must be inclusive of these perspectives and their support. Therefore, Affiliate membership is applicable to insurance brokers and collective groups (such as insurance associations, unions and P&I Clubs), and we welcome such support. Information on the activities and requirements for Affiliate members is available throughout the Technical Guidance where appropriate.

It is the intention that over time, and with increasing access to reliable data and information for public disclosure of climate alignment, the scope of the Principles will expand to include more Affiliate members as Signatories.

This section outlines the requirements for the Affiliate members. Specific guidance for each Principle is found in the corresponding section of the Technical Guidance.

## 1. Assessment

Affiliate members will support Signatories by sharing knowledge about the Assessment principle and climate alignment methodology with relevant stakeholders, in line with the Technical Guidance.

## 2. Accountability

Affiliate members will, for each step of the assessment and as necessary, support Signatories by sharing knowledge about the Accountability principle and data collection process with relevant stakeholders, in line with the Technical Guidance.

## 3. Enforcement

Affiliate members will agree to work with Signatories, shipowners, other marine insurance providers, brokers and business partners where possible, to support Signatories by sharing knowledge about the Enforcement principle and standardized clauses with relevant stakeholders, in line with the Technical Guidance.

## 4. Transparency

1. Upon becoming an Affiliate member, the organization will publicly acknowledge that it is an Affiliate member of the Poseidon Principles for Marine Insurance.
2. On an annual basis, no later than 30 November, the Affiliate members will:

    a. Complete the annual self-assessment for Affiliate members, which includes public disclosure requirements for inclusion in the Annual Report;
    b. And include the disclosure requirements in relevant institutional reports on a timeline that is appropriate for that institution.

    These requirements take effect for each Affiliate member in the following calendar year in which it becomes a member.

# Technical guidance

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# Introduction

The purpose of the Technical Guidance is to clearly state the requirements and expectations for each Principle: Assessment, Accountability, Enforcement, and Transparency.

The Poseidon Principles for Marine Insurance are consistent with the IMO's ambition for GHG emissions from international shipping to peak as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008[11]. The ambition is to be consistent with the goals of the Paris Agreement in due course, to *achieve climate neutrality by 2050, and to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels*[12]. To this end, both a 50% and 100% reduction decarbonization trajectory will be reported annually in line with the Technical Guidance.

It is recognized that some Signatories may choose to both fulfil their obligations under the Poseidon Principles for Marine Insurance, as well as go beyond those obligations. Some Signatories may choose to do this through assessing their portfolios relative to a steeper decarbonization trajectory or additional target setting.

It is recommended that, where possible, these additional efforts rely on the assessment, accountability enforcement, and transparency practices established by the Poseidon Principles for Marine Insurance to ensure that these further efforts are robust in their demonstration of industry leadership.

The Poseidon Principles for Marine Insurance are not envisioned to be a static set of transparency requirements for insurance providers over time. Rather, they will be improved and strengthened over time with the availability of new data, research, regulations and internationally set standards for the maritime sector, and for society as a whole. The ambition will be reviewed and may be extended by Signatories on a timeline that is at their discretion.

11 IMO (2018). Resolution MEPC.304 (72) (adopted on 13 April 2018), Initial IMO strategy on reduction of GHG emissions from ships, IMO doc MEPC 72/17/Add. 1, Annex 11.

12 https://unfccc.int/sites/default/files/english_paris_agreement.pdf

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# Assessment of climate alignment

## PRINCIPLE

**We will annually assess climate alignment in line with the Technical Guidance for all Business Activities.**

## REQUIREMENTS

Signatories will, on an annual basis, measure the carbon intensity and assess climate alignment (carbon intensity relative to established decarbonization trajectories) of their hull and machinery portfolios. This requirement takes effect for each Signatory in the following calendar year after the calendar year in which it became a Signatory.

This section provides a step-by-step guidance for measuring the climate alignment for insurers and their shipping portfolios.

The guidance is framed in the context of the existing IMO environmental regulations and climate agreements, as well as the Paris Agreement and its commitments. It is informed by recommendations made by the Carbon Disclosure Project (CDP), the Task Force on Climate-related Financial Disclosure (TCFD), the Science Based Targets Initiative (SBTi), the Poseidon Principles for Financial Institutions, Sea Cargo Charter (SCC), the Net Zero Insurance Alliance (NZIA) and UNEP FI Principles for Sustainable Insurance (UNEPFI PSI).

## The Paris Agreement and IMO Targets

The Paris Agreement, adopted at COP21 in December 2015, is the first universal and legally binding global climate agreement, which establishes a framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C compared to pre-industrial levels. To meet this goal, global emissions must peak as soon as possible to achieve climate neutrality by mid-century. At the time, there was no shipping-specific target or mention in the Agreement itself – the sector faced the challenge of setting its own targets.

The shipping industry's governing body, the IMO, approved the Initial GHG Strategy ("the Initial Strategy") in April 2018 to reduce GHG emissions generated by shipping activity, which represents a significant shift in climate ambition for a sector that currently accounts for 2%–3% of global carbon dioxide emissions. This Initial Strategy sets out the following levels of ambition:

3. To reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 ("**the IMO Absolute Target**"). See Figure 1.
4. To reduce $CO_2$ emissions per transport work by at least 40% by 2030, pursuing efforts towards 70% by 2050 compared to 2008 ("**the IMO Intensity Targets**"). See Figure 1.

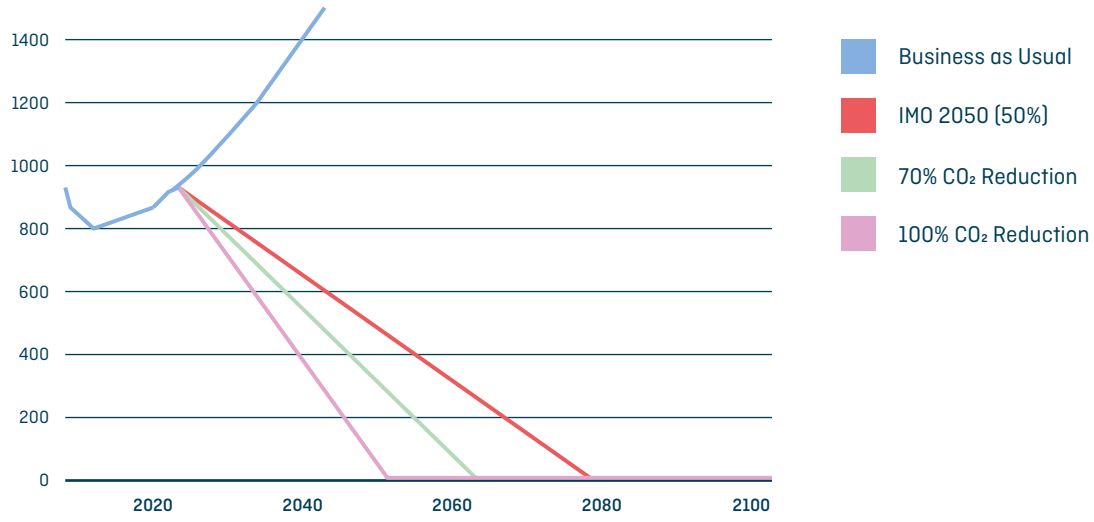



**Figure 1.**
Global fleet's $CO_2$ target and trajectories under IMO targets (million tonnes of $CO_2$)

The IMO Absolute Target can be converted into a relative (carbon intensity) target. Figure 2 shows three possible intensity trajectories consistent with the Initial Strategy compared to the pathway drawn using the IMO Intensity Targets. The IMO Intensity Targets lie significantly above the other pathways consistent with the IMO Absolute Target.

There is some misalignment between the IMO Absolute Target and the IMO Intensity Targets:

1. The IMO Intensity Targets were set prior to the determination of the IMO Absolute Target. Depending on future demand for shipping services, the IMO Absolute Target and IMO Intensity Targets may or may not align. Alignment is unlikely, however.
2. The wording of the IMO Initial Strategy does not state that meeting the IMO Intensity Targets ensures compliance with the IMO Absolute Target.

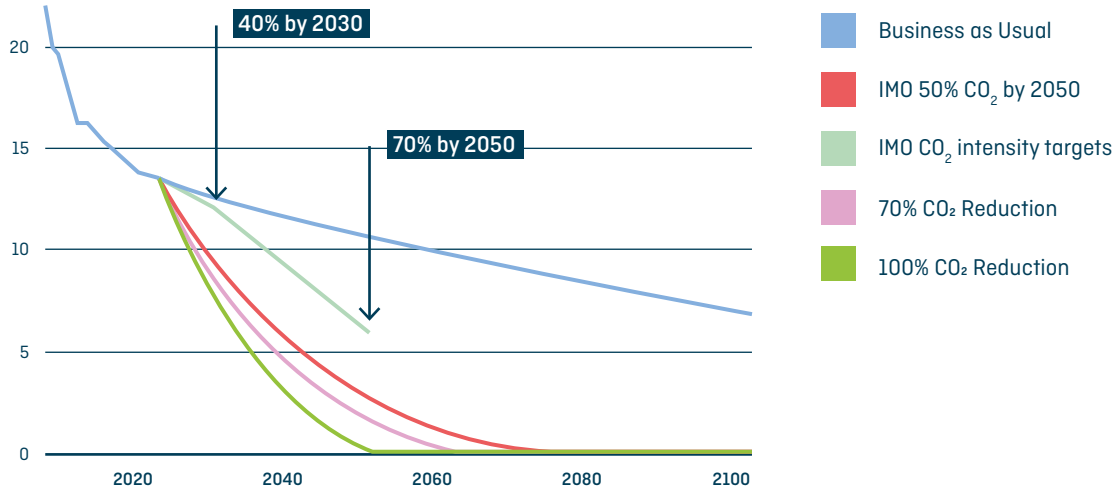



**Figure 2.**
Global fleet's carbon intensity targets and trajectories (grams of $CO_2$ per tonne-nautical mile [$gCO_2$/tnm])

It is expected that the IMO will update the IMO Intensity Targets to better align with the IMO Absolute Target at the forthcoming review process for the IMO's Initial GHG Strategy. The IMO Absolute Target and the goals of the Paris Agreement[13] are used to establish the ambition of the Poseidon Principles for Marine Insurance:

1. For emissions from shipping to peak as soon as possible
2. To achieve at least 50% $CO_2$ reduction by 2050 compared to 2008
3. In time, to achieve 100% $CO_2$ reduction by 2050 to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

For these reasons, and to enable alignment with the climate goals established by both the IMO at first, and the Paris Agreement over time, the Poseidon Principles for Marine Insurance will provide two global decarbonization trajectories as part of the annual reporting requirements. One trajectory with 50% $CO_2$ reduction in absolute carbon emissions by 2050 (the "**50% Reduction Trajectory**"), and the other with 100% $CO_2$ reduction in absolute carbon emissions by 2050 ("the "**100% Reduction Trajectory**"). Detailed practical information for Signatories to report on two trajectories with one climate alignment score is elaborated further in this section. The trajectories are found in Appendices 3 and 4.

It is important to note that the IMO's MEPC meets regularly to discuss GHG regulation that will be used to meet the ambition set out by the Initial Strategy. The Poseidon Principles for Marine Insurance is expected to evolve as and when the IMO creates new policies that align with the PPMI's ambition. These policies are developed at the IMO's MEPC meetings, held regularly during the year, and progress towards its Initial Strategy will be closely monitored.

13 Both the IMO Absolute Target and the Paris Agreement count the annual reduction of all GHGs globally. Currently, the trajectories used by the Poseidon Principles for Marine Insurance use the annual reduction of $CO_2$ globally (by at least 50% and by 100%). Including all GHG or using $CO_2e$ in the Poseidon Principles methodology can be further explored at the discretion of the members.

## 2.1 Selecting a metric using the IMO 4th GHG study

The Average Efficiency Ratio, or AER, will be used to measure climate alignment, due to the availability of existing data from the IMO and for consistency with the Poseidon Principles methodology.

Both absolute and intensity measurements of $CO_2$ emissions are useful for meeting the IMO and Paris levels of ambition, and both measurements are recommended by other initiatives. Absolute emissions are important as they represent the total emissions figure that will ultimately need to be reduced to mitigate climate change. However, an absolute emissions measure is not well-suited to the management or comparison of emissions/decarbonization at the level of individual vessels or a group of vessels because vessels have different production units and need to be compared on a like-for-like basis. For this reason, the relative intensity-level metric is used in both the Poseidon Principles for Financial Institutions and for Marine Insurance.

In shipping, carbon intensity represents the total operational emissions generated to satisfy a supply of transport work (grams of $CO_2$ per tonne-nautical mile [$gCO_2$ / tnm]). Carbon intensity is typically quantified for multiple voyages over a period of time (eg a year). To provide the most accurate representation of a vessel's climate impact, the carbon intensity of a vessel should be measured from its performance in real operating conditions instead of using a design specification metric (eg the Energy Efficiency Design Index).

The selection of this single metric is guided by an ambition that the Poseidon Principles for both Financial Institutions and Marine Insurance use a carbon intensity metric which produces the closest measure of the vessel's true carbon intensity, while ensuring consistency with the policies and regulations of the IMO and the IMO DCS regulation and associated guidelines. The IMO DCS defines the data that the IMO has mandated for shipowners to collect and report per calendar year. The IMO DCS is an amendment to MARPOL Annex VI which entered into force in March 2018. The IMO DCS specifies the data to be collected and reported for each calendar year for ships which are 5 000 gross tonnage and above engaged in international trade:

1. The amount of fuel consumption for each type of fuel in metric tonnes
2. Distance travelled
3. Hours underway
4. Technical characteristics of the ship including DWT at maximum summer draught

Prior to reporting to the IMO, the data must be checked so that it is in accordance with the regulation by the relevant flag state or any organization duly recognized by it (ie an RO). A Statement of Compliance ("SoC") will be issued by the relevant flag state or RO no later than five months from the beginning of the following calendar year (eg for the calendar year 2021, it would be issued by the end of May 2022) provided the data is in accordance with the regulation. The reported data is transferred to the IMO Ship Fuel Oil Database no later than one month after issuing the relevant SoC.

The data reported to the IMO is anonymized and confidential, and therefore it cannot be accessed from the IMO by the Signatories. However, because the regulation requires that all shipowners annually collect and report parameters relevant to the calculation of carbon intensity, the administrative burden placed on shipowners is minimized and simplifies the application of the Poseidon Principles for both Financial Institutions and Marine Insurance.

The IMO DCS enables the calculation of a carbon intensity metric known as the Annual Efficiency Ratio ("AER"), using the parameters of fuel consumption, distance travelled and deadweight at maximum summer draught ("DWT"). AER is reported in unit grams of $CO_2$ per tonne-mile ($gCO_2$ /dwt-nm):

$$AER = \frac{\sum_i C_i}{\sum_i dwtD_i}$$

**Equation 1**

where Ci is the carbon emissions for voyage i computed using the fuel consumption and carbon factor of each type of fuel, dwt is the deadweight at maximum summer draught of the vessel and Di is the distance travelled on voyage i[14]. The AER is computed for all voyages performed over a calendar year.

This metric is calculated using an approximation of the total annual transport work performed by a ship, obtained from its total distance travelled and DWT (in tonne units). It is recognized that AER is less accurate at estimating a vessel's carbon intensity than some other metrics (eg Energy Efficiency Operational Indicator "EEOI") because the actual cargo carried by a ship is often less than its maximum capacity, and many ships (eg tankers and bulkers) operate with ballast voyages where for several voyages a year they have no cargo on board.

Currently, data on the mass of cargo carried on individual voyages is not globally collected through the IMO DCS or available globally from publicly accessible data sources to enable the calculation of EEOI. Should the IMO amend the DCS regulation to include data on the mass of cargo carried, or this data becomes available elsewhere at appropriate coverage and accuracy, the metric used to calculate climate alignment under the Poseidon Principles for Marine Insurance may be adapted to reflect this. Additional information on metric considerations is available in Appendix 2.

14 The emission factors can be found in MEPC 63/23 Annex 8.
HFO: 3114 t($CO_2$ )/t fuel
MDO/MGO: 3206 t($CO_2$ )/t fuel
LNG: 2750 t($CO_2$ )/t fuel
It should be noted that low sulphur fuels carry the same $CO_2$ emission factor.

## 2.2 Calculating vessel carbon intensity

Vessel carbon intensity can be calculated using data provided by the shipowner as collected in the IMO DCS. This data has already been independently checked to ensure compliance in accordance with the IMO DCS but requires the shipowner to provide consent for the data as submitted to the relevant flag state to be shared with the Signatory. The Poseidon Principles for Marine Insurance require that all Signatories use this method for calculating carbon intensity.

There may be circumstances where it is not possible to gain access to the data as reported under the IMO DCS from shipowners. Guidance on how to address this situation is provided at the end of section 2.5 on steps for calculating climate alignment of the portfolio.

## 2.3 Assessing climate alignment

For the purposes of the Poseidon Principles for Financial Institutions and for Marine Insurance, climate alignment is defined as the degree to which a vessel, policy or portfolio's carbon intensity is in line with decarbonization trajectories that meet the IMO ambition of reducing total annual GHG emissions by at least 50% by 2050 based on 2008 levels, or a 100% reduction target to support the Paris Agreement. For the Poseidon Principles for Marine Insurance, the trajectories measure to what degree the portfolio meets the IMO ambition or the Paris Agreement ambition.

A decarbonization trajectory is a representation of how many grams of $CO_2$ a single ship can emit to move one tonne of goods one nautical mile ($gCO_2$ /tnm) over a time horizon (as shown in Figure 1 and Figure 2). The decarbonization trajectories rely on two assumptions:

- Projections of transport demand for different shipping sectors up to 2050, including those available in the Fourth IMO GHG Study.
- The total $CO_2$ shipping emissions permitted to be in line with the 2050 targets (the IMO and the Paris Agreement).

While these trajectories will be drawn and updated with the latest available research and will be aligned with or equal to the IMO's projections, there are uncertainties within them because of the two assumptions noted above.

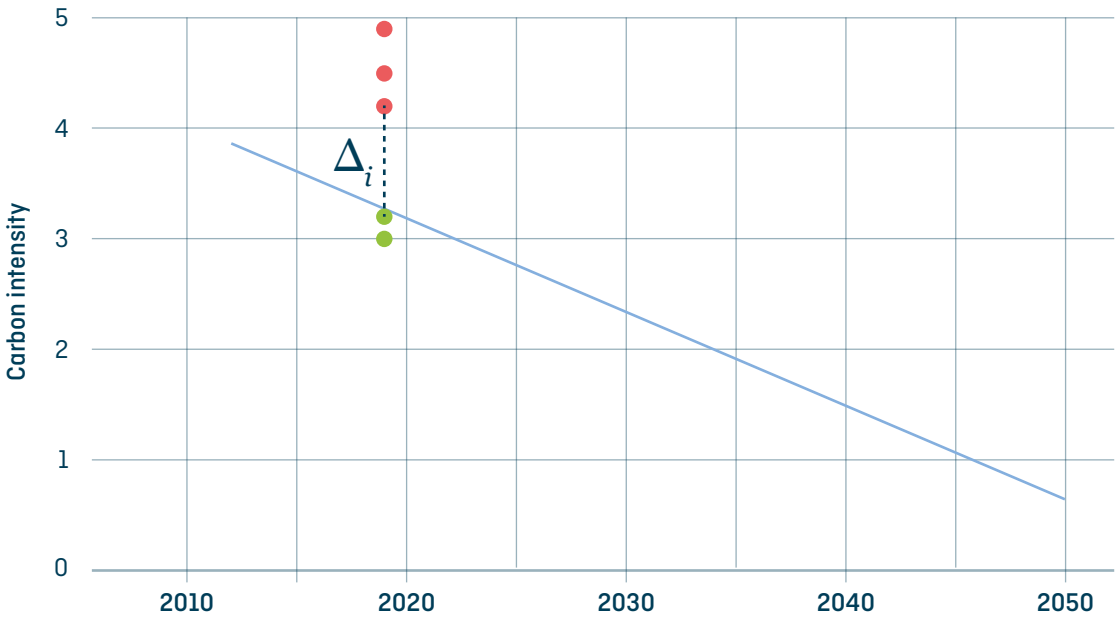



**Figure 3.**
Carbon intensity and climate alignment

To assess climate alignment of a single vessel, the vessel's annual carbon intensity is compared with the decarbonization trajectory for its respective ship type and size class. To assess climate alignment at the policy and portfolio level, the vessel carbon intensities in each policy and the portfolio are aggregated. Section 2.5 discusses the method that is used.

In Figure 3, each dot represents the annual carbon intensity of a vessel. The blue line represents the decarbonization trajectory for a given ship type and size class. The green dots represent vessels (of the same ship type and size class) that are aligned, while the red dots correspond to vessels that are misaligned.

Climate alignment at the vessel level is the percentage difference between a vessel's carbon intensity and the intensity on the decarbonization trajectory at the same point in time t (eg year). It is expressed as a (+/-) %. In mathematical terms, the climate alignment of a vessel i at the reported time is:

$$\Delta_i = \left( \frac{x_i - r_s}{r_s} \right) 100$$

**Equation 2**

where $x_i$ is the carbon intensity of vessel i (ie the AER computed in Equation 1) and $r_s$ is the required carbon intensity for the ship type and size class for reported year based on the decarbonization trajectory. The multiplication by 100 is to convert into percentage terms. A positive alignment score means a vessel is misaligned (above the decarbonization trajectory), whereas a negative or zero score means a vessel is aligned (respectively, below or on the decarbonization trajectory).

## 2.4 Decarbonization Trajectories

Climate alignment is defined as the degree to which a vessel, policy or portfolio's carbon intensity is in line with a decarbonization trajectory. For the Poseidon Principles for Marine Insurance, the trajectories measure to what degree the portfolio meets the IMO ambition or the Paris Agreement ambition.

The Poseidon Principles for Marine Insurance are consistent with the IMO's ambition for GHG emissions from international shipping to peak as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008[15]. The ambition is to be consistent with the goals of the Paris Agreement in due course, to achieve climate neutrality by 2050, and to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels[16]. In order to support the move toward climate neutrality by mid-century, a 100% $CO_2$ reduction trajectory is also provided. To this end, both decarbonization trajectories will be reported annually in line with the Technical Guidance.

Standard decarbonization trajectories will be produced by the Secretariat of the Poseidon Principles based on agreed and clearly stated assumptions consistent with the 50% $CO_2$ reduction and 100% $CO_2$ reduction trajectories, respectively. These will be produced for each ship type and size class and will be produced in a format that allows for simple weighted aggregation to the portfolio level. This is to ensure that once the carbon intensity of vessels is understood, it will be simple and practical to understand climate alignment. This also ensures that numbers are comparable between Signatories.

Appendix 3 describes the method used for establishing the target carbon intensity for a given ship type and size class in a given year. This is carried out by calculating a decarbonization-consistent carbon intensity trajectory from 2012 up to 2050. The method is derived from IMO Secretariat-commissioned data sources, both the Fourth IMO GHG Study and additional IMO MEPC publications. Assumptions for formulating the trajectory are also taken from the Initial Strategy, including the use of a 2008 baseline to establish the absolute emissions levels required by 2050 used in the formulation of the carbon intensity decarbonization trajectories. As with the Poseidon Principles for Financial Institutions, the trajectories are developed and validated for the initiative by the advisory services by UMAS.

15 IMO (2018). Resolution MEPC.304 (72) (adopted on 13 April 2018), Initial IMO strategy on reduction of GHG emissions from ships, IMO doc MEPC 72/17/Add. 1, Annex 11.

16 https://unfccc.int/sites/default/files/english_paris_agreement.pdf

## Aligning with two trajectories

In order to show the portfolio climate alignment score against two trajectories, the Poseidon Principles for Marine Insurance use a traffic light approach.

For any given reporting year

- A red dot represents an alignment delta at or above the IMO target of at least 50% reduction (misaligned)
- A yellow dot represents an alignment delta at or below the IMO target, which remains above the 100% reduction target but aligned with the IMO target of at least 50% reduction
- A green dot represents an alignment delta at or below the 100% reduction target (aligned with 100% reduction by mid-century)

The traffic light approach is illustrated below in Figure 4, which represents several vessels of the same ship type and size graphed together, similar to Figure 3 above.

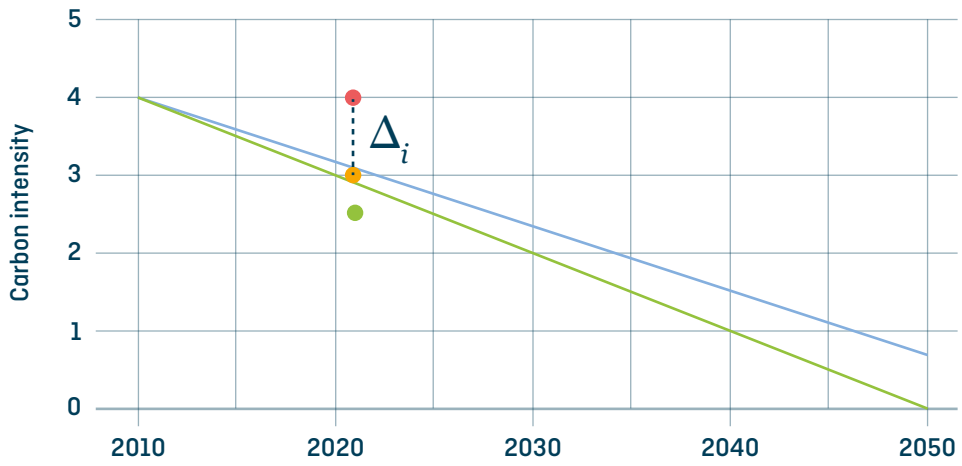



**Figure 4.**
Carbon intensity and climate alignment with both trajectories

In practice, a Signatory would perform the calculations in line with the trajectory provided for the IMO target. The threshold % which corresponds to the delta value needed to be aligned also with the 100% reduction trajectory for any given year in relation to the IMO target trajectory will be provided by the Secretariat as a negative %. A Signatory would then need a negative number to be aligned with the 50% reduction trajectory, and an alignment delta at or below the negative threshold % to be aligned with the 100% reduction trajectory.

Additional guidance for these calculations is included in the next section.

## 2.5 Aggregating alignment for policies and portfolio

In order to calculate portfolio climate alignment, one must first calculate the climate alignment of each vessel within the portfolio. Then, the climate alignment of the portfolio can be calculated.

### Steps for calculating climate alignment of the portfolio

For each vessel in a relevant policy, compare the annual carbon intensity of that vessel with the required decarbonization value[17]. The alignment delta $\Delta_i$ at time t is given by Equation 2.

Signatories compute the weighted average of the vessel alignment deltas using the share of deadweight insured (i.e. the vessel's deadweight multiplied by the share insured for each vessel in the portfolio).

$$\Delta_p = \sum_{i=1}^{N} w_i \Delta_i$$

**Equation 3**

In Equation 3 the computation for the portfolio alignment delta, $\Delta_p$ is reported:

where $w_i$ is the vessel's weighting metric, calculated as vessel deadweight multiplied by the share insured for that vessel; $\Delta_i$ is the vessel alignment, from Equation 2, and N is the total number of vessels in the portfolio.

17 The required decarbonization value is the maximum carbon intensity ($gCO_2$/tnm) that a vessel can achieve and still be aligned with the decarbonization trajectory. It is taken from the decarbonization trajectory that corresponds to the specific vessel's type/class size.

## Specific guidance for calculations

- The AER calculation for a vessel shall be based on a full calendar year as provided in MARPOL Annex VI Regulation 22A (ie 1 January until 31 December).
  However, where a shipowner was the owner of (or responsible for) a vessel for only part of a calendar year, and where IMO DCS data is therefore not furnished for the full year, the AER calculation may be based on a period shorter than a calendar year.
  However, the requirement for provision of an SoC and/or Verification Letter for an applicable Reporting Period (including a period shortened as above) shall remain unaffected.
- As seen with the implementation of the Poseidon Principles for Financial Institutions and the Sea Cargo Charter, this approach provides a snapshot in time of the carbon intensity of the portfolio, and is not intended to be a directional instrument or tool.
- When calculating alignment, the data provided by the client (as it was provided for submission to the IMO DCS, with the verification document) is for the previous calendar year. Therefore, the portfolio information used for the final aggregated climate alignment score must also be used for the corresponding calendar year (eg calculations due on 30 November 2021 use emissions data from 2020, and portfolio information/weighting metric on 1 October 2020).
- When Signatories are aggregating vessels' climate alignment scores to the portfolio level, necessary information is retrieved on a snapshot date of the year in which alignment is measured. The weighted average for alignment should be computed using the deadweight and the insurer's share of vessels for any policy that is in force on the snapshot date.
- The deadweight is always intended to be the deadweight at maximum summer draught of the vessel and should be the same used in the calculation of carbon intensity, including the case of Ferry-RoPax, Ferry pax-only, Cruise and Vehicle where gross tonnage is used instead of deadweight to calculate carbon intensity.

## Specific guidance for Affiliate members

*Affiliate members will support Signatories by sharing knowledge about the Assessment principle and climate alignment methodology with relevant stakeholders, in line with the Technical Guidance.*

## Worked example: Calculating alignment at the vessel and portfolio level

In this example, a Signatory starts measuring its climate alignment in 2021. Table 1 illustrates a simple example of a portfolio with two policies of two vessels each and shows the alignment delta of each vessel and their weight in the portfolio. The portfolio alignment delta shown in Table 1 is aggregated using a weighted average according to Equation 3. Weighting is applied as the share of deadweight insured of each vessel. The portfolio is not climate aligned with respect to the IMO 50% reduction target because it is on average 10% above the carbon intensity required from the decarbonization trajectory as shown in Table 2.

| Policy | Year | IMO no. | Actual AER | Required AER | Alignment Delta | DWT* share (tonnes) | Relative WEIGHT (portion of portfolio) |
|---|---|---|---|---|---|---|---|
| 1 | 2021 | 9511XXX | 7 | 8.3 | -16% | 2500 | 11% |
| 1 | 2021 | 9340XXX | 10.4 | 9.8 | 6% | 11500 | 49% |
| 2 | 2021 | 9293XXX | 10.1 | 8.3 | 21% | 8500 | 36% |
| 2 | 2021 | 9331XXX | 9.5 | 7.5 | 26% | 1000 | 4% |

**Table 1.**
Vessel and portfolio alignment calculations

| | Exposure (tonnes) | Aligment Delta |
|---|---|---|
| Portfolio | 23500 | 10% |

**Table 2.**
Weighted portfolio alignment score

In practice, a Signatory would perform the calculations in line with the trajectory provided for the 50% reduction trajectory. The threshold % which corresponds to the delta value needed to be aligned also with the 100% reduction trajectory for any given year in relation to the 50% reduction trajectory will be provided by the Secretariat as a negative % as shown below in Table 3. A Signatory would then need a negative number to be aligned with the 50% reduction trajectory, and an alignment delta at or below the negative % to be aligned with the 100% reduction trajectory.

The table below illustrates the alignment deltas for both trajectories in an example year Y for ship type T, which would be provided by the Secretariat.

| Required threshold % for 50% reduction trajectory | Required threshold % for 100% reduction trajectory |
|---|---|
| 0% | -7% |

**Table 3.**
Alignment with two trajectories

3

# Accountability and Enforcement

This section provides information on the requirements and technical guidance for both the accountability and enforcement principles for the sake of clarity and simplicity. In terms of the implementation, both principles are closely related.

The accountability and enforcement principles are intended to ensure that the assessment and disclosure of portfolio climate alignment under the Poseidon Principles for Marine Insurance is practical, fair and accurate. The aim of this approach is to ensure the development of trust in the Principles amongst Signatories.

The Poseidon Principles for Marine Insurance use carbon intensity as the metric to measure climate alignment. In order to align with the IMO DCS, which is mandatory for all ships 5 000 gross tonnage and above and engaged in international trade, the Principles rely specifically on AER as the carbon intensity metric.

The Technical Guidance for the accountability and enforcement principles lays out the four steps in the information flow process. At each step, the assessment and enforcement requirements are clearly identified.

## 3.1 Accountability

### PRINCIPLE

> We recognize the important role that unbiased information plays in data collection and reporting fuel consumption from ships in order to achieve the decarbonization goals of the sector. We will rely on trusted entities and mandatory regulations as explicitly identified in the Technical Guidance for the provision of information used to assess and disclose climate alignment.

### REQUIREMENTS

For each step of the assessment, Signatories will exclusively rely on the data types, data sources and service providers identified in the Technical Guidance.

## 3.2 Enforcement

**PRINCIPLE**

> We will require that ongoing compliance with the Poseidon Principles for Marine Insurance is made contractual in all business activities using standardized covenant clauses. We will contribute to the update and addition of standardized clauses through the annual review process.

Signatories will agree to work with clients and partners to covenant the provision of necessary information to calculate carbon intensity and climate alignment.

## 3.3 Requirements and information flow

This section is broken into four information flow steps. The aim of this section is to provide appropriate background information that clearly demonstrates how information flows between parties. Specific accountability requirements regarding data types, data sources and service providers are stated at each step. The enforcement requirement of using a standardized covenant clause is referenced, and the clause itself is available from the Secretariat. The information flow process relies on data that shipowners are required to report in order to be compliant with the IMO DCS and accordingly be granted an SoC or Verification Letter by the RO as discussed in Section 2.1. The IMO DCS requirements are separate from, and pre-date, the Poseidon Principles for Financial Institutions and for Marine Insurance.

Figure 5 provides an overview of the potential information flow pathways. The pathways are divided into "preferred pathways" and "allowed pathways" tracks. Preferred pathways are those that rely on IMO-ROs to maintain data veracity and confidentiality.

For clarity, once a Signatory has chosen either the preferred or allowed pathways track, it may choose any option available for that step. For example, if a Signatory chooses the allowed pathways track, it may choose to use any of the three available options for steps 2 and 3.

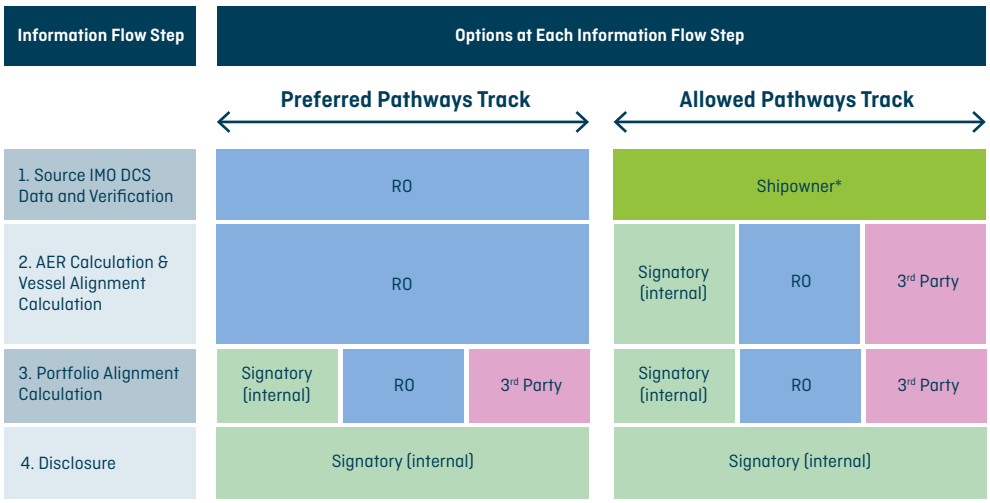



**Figure 5.**
Information flow pathway tracks

**Step 1** Sourcing vessel IMO DCS data & verification

**Step 2** Calculating vessel carbon intensity and climate alignment

**Step 3** Calculating portfolio climate alignment

**Step 4** Disclosure

## Data types

Good quality primary (actual) data is what should be used by the shipowner to calculate its Scope 1 carbon emissions, and what stakeholders involved in the maritime supply chain aim to collect from their clients for their Scope 3 emissions accounting. This is the ideal source to further push for increased access to emissions data and for increased transparency across the shipping industry.

Estimated or default data is used when there are data gaps in the primary data or when no data whatsoever is available. To obtain estimated data, companies and commercial calculation tool providers model fuel use, and hence emissions, using the best available information (eg on cargo type and quantity, journey origin and destination, vessel characteristics, load factors). Default data is based on average industry operating practices.

Just as in the Poseidon Principles for Financial Institutions, estimated and default data is not allowed under either pathway of the Principles. Signatories to this initiative can encourage clients to provide the necessary (primary) data, and additional terms in the policy (or separate wording) will require insurers to request their clients to disclose the data reported to IMO in the previous year.

## Step 1: Sourcing vessel IMO DCS data

Step 1 requires the sourcing of IMO DCS data and SoC for the calculation of AER. It is permissible to source data from the RO upon the consent of the shipowner or directly from the shipowner. As Figure 6 indicates, sourcing data from an RO is preferable while sourcing data from the shipowner is allowed.

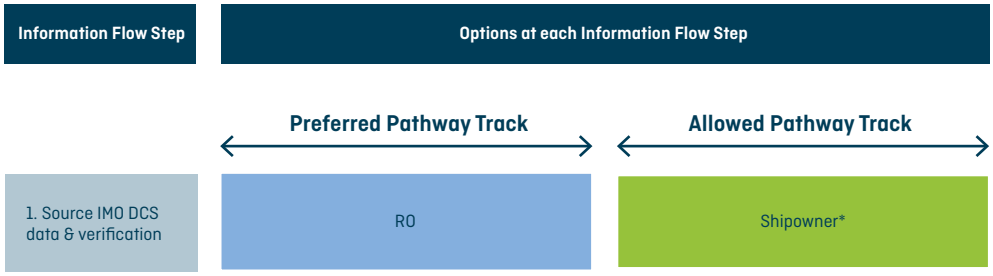



**Figure 6.**
Data sourcing

Figure 7 demonstrates how the Poseidon Principles for Marine Insurance interact with pre-existing requirements under the IMO DCS. Under IMO DCS requirements, the shipowner provides the specified data to the RO. The RO checks and verifies that the data is in accordance with the IMO regulation, issues an SoC/Verification Letter to the shipowner and then submits the data to the IMO Ship Fuel Oil Consumption Database.

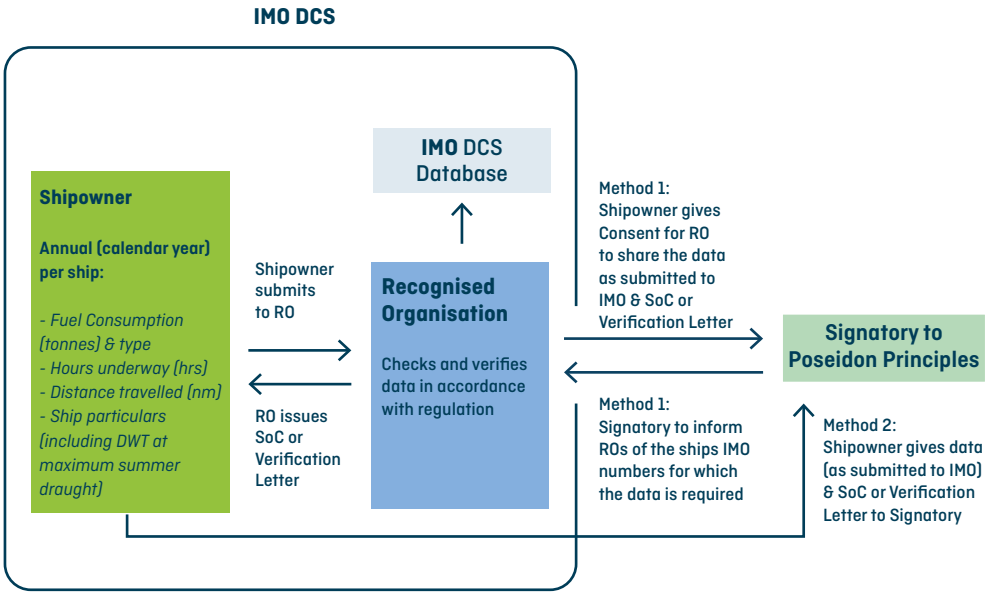



**Figure 7.**
Method for sourcing vessel IMO DCS data

## Permissible information flow methods:

**Method 1 (preferred pathway):** RO(s) provides data and SoC/Verification Letter to Signatory
*Note that consent for the RO to share IMO DCS data with the Signatory can be given through the standard covenant clause.

**Method 2 (allowed pathway):** Shipowner(s) provides data and SoC to Signatory. The Signatory requests the shipowner to provide the data as submitted to the IMO DCS and the SoC/Verification Letter. Signatories are advised to ask shipowners for data "as it was submitted to the IMO" to reduce risk of error.

**Special guidance for calculations:**
Where there may be multiple insurers involved in one transaction, it remains the responsibility of the Signatory to collect the appropriate information from an RO or the shipowner. However, it is both allowed and encouraged that Signatories should work to reduce administrative burden by collaborating where possible.

For example, if multiple Signatories are sourcing data from a shipowner and/or an RO, it is in their interests and the interest of the shipowner or RO to coordinate their data requests.

**How to meet the requirements:**

1. IMO DCS data must be sourced from an RO or from the shipowner.
2. IMO DCS data may only be used if it is accompanied by an SoC or Verification Letter provided by an RO.

## Step 2: Calculating vessel carbon intensity and climate alignment

Step 2 requires the calculation of vessels' carbon intensity using the IMO DCS data and the calculation of vessels' alignment with decarbonization trajectories. There are three methods for undertaking these calculations. The first method is relevant only to the preferred pathways track, while the latter two are relevant to the allowed pathways track.

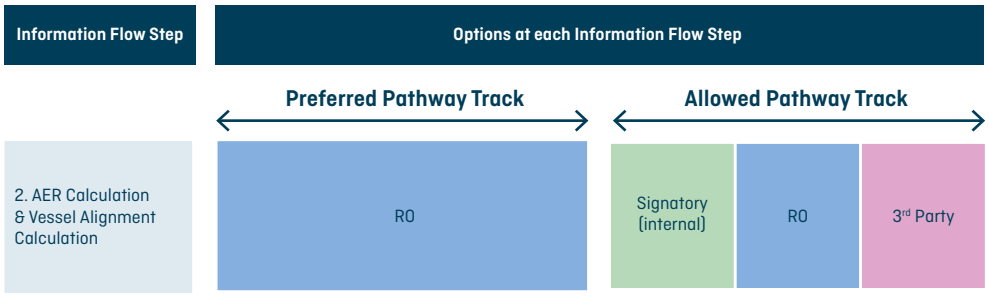



**Figure 8.**
Vessel alignment calculation

AER is used as the carbon intensity metric and is detailed in Section 2.1. The IMO DCS data used for calculating AER is also detailed in Section 2.1. Standard decarbonization trajectories for each ship type and size class are produced specifically for the purposes of the Poseidon Principles for Financial Institutions and for Marine Insurance, so that all calculations are carried out in the same way. These are available through the Secretariat.

## Permissible methods for calculation:

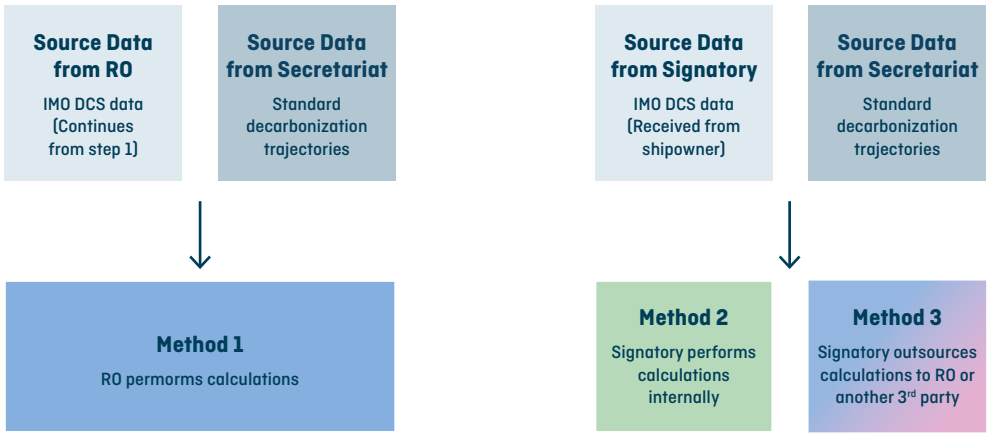



**Figure 9.**
Methods for calculating carbon intensity and vessel climate alignment

**Method 1 (preferred pathway)**: RO calculates vessel carbon intensity and climate alignment on behalf of the Signatory. This is described to the shipowner in the data consent letter each year.

1. The RO will source the standard decarbonization trajectories from the Secretariat.
2. The RO calculates vessel carbon intensity and climate alignment on behalf of the Signatory using the verified data from the IMO DCS.
3. The RO provides the Signatory with the carbon intensity (AER) of the vessel(s) and the decarbonization delta for the vessel(s), the IMO DCS data and the SoC/Verification Letter.

**Method 2 (allowed pathway)**: Signatory uses data provided by shipowner(s) to carry out vessel carbon intensity and climate alignment calculations internally. This is described to the shipowner in the data consent letter each year.

1. Using the verified IMO DCS data as submitted to the flag state provided by the shipowner and the standard decarbonization trajectories, the Signatory calculates carbon intensity and climate alignment of the vessel(s).

**Method 3 (allowed pathway):** After receiving data from shipowners, Signatory outsources carbon intensity and climate alignment calculations to an RO or another third party[18]. This is described to the shipowner in the data consent letter each year.

1. After selecting an RO or another third party in accordance with accountability requirements below, the Signatory should send the verified IMO DCS data, SoC/Verification Letter and the standard decarbonization trajectories to that party.
2. The RO or other third party calculates vessel carbon intensity and climate alignment on behalf of the Signatory using the verified data from the IMO DCS.
3. The RO or other third party provides the Signatory with the carbon intensity (AER) of the vessel(s) and the decarbonization delta for the vessel(s).

**How to meet the requirements**

- The Signatory includes the standard clause in agreements and shares the data consent letter with clients annually. The letter outlines the pathway chosen by the Signatory. Both elements are provided by the Secretariat.
- Vessel carbon intensity and climate alignment calculations must rely solely on verified IMO DCS data (ie data for which an SoC/Verification Letter has been issued) and standard decarbonization trajectories provided by the Poseidon Principles Secretariat.
- Vessel carbon intensity and climate alignment calculations can be performed by Signatories, ROs or other independent third parties (ie those that are not ROs).

18 Various external third-party service providers offer services related to $CO_2$ emissions and analytics. As a rule, access to these services is subject to a fee from the third party.
If a third party other than an RO is used, that party must be regarded as independent and have no shipbroking or commercial vessel interests. The Secretariat is agnostic about providers and does not verify or recommend third parties for this purpose, but it is in the Signatory's best interest to compare different options as it suits their needs.

## Step 3: Calculating portfolio climate alignment


**Figure 10.**
Portfolio alignment calculation

Step 3 requires the calculation of portfolio climate alignment using the vessel climate alignment data from step 2 and Signatories' portfolio data (ie deadweight and insurer's share of vessels insured). There are two methods for undertaking this calculation. Methods 1 and 2 are applicable in both the preferred pathways and allowed pathways tracks. This is due to the sensitivity of portfolio information.

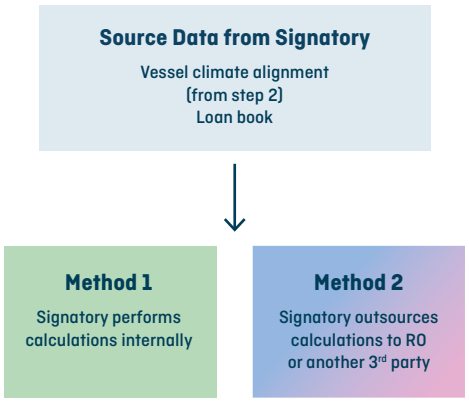



**Figure 11.**
Methods for calculating portfolio climate alignment

The Poseidon Principles for Marine Insurance will use the deadweight multiplied by the insurer's premium share as the aggregation weight for the portfolio alignment calculations. The assessment will be done for any policy that is in force on the snapshot date of the year (ie 1 October). The steps to calculate the portfolio alignment delta are as follows:

1. For each vessel in any policy that is in force on the snapshot date of the year, the climate alignment delta is computed. Information about the deadweight and the insurer's premium share is collected from each vessel.
2. Portfolio alignment delta is calculated as the weighted average of vessel's alignment deltas weighted by premium share of deadweight insured (ie vessel's deadweight multiplied by the premium share) of each vessel in the portfolio.

## Permissible calculation methods:

**Method 1 (preferred and allowed pathways)**: Signatory performs portfolio climate alignment calculations internally.

1. Using vessel climate alignment data from step 2, Signatory undertakes climate alignment calculations internally.

**Method 2 (preferred and allowed pathways)**: Signatory outsources portfolio climate calculations to an RO or another independent third party.

1. After selecting an RO or another independent third party in accordance with accountability requirements below, the Signatory should send climate alignment and relevant portfolio data (ie deadweight multiplied by the share of vessels insured) for all vessels within the scope of the Poseidon Principles for Marine Insurance to that party.
2. The RO or other independent third party calculates the Signatory's portfolio climate alignment using climate alignment and portfolio data for all vessels within the scope of the Poseidon Principles for Marine Insurance.
3. The RO or other independent third party provides the Signatory with its portfolio climate alignment score.

**How to meet the requirements**

1. Vessel carbon intensity and climate alignment calculations must rely solely on verified IMO DCS data (ie data for which an SoC has been issued) and standard decarbonization trajectories provided by the Poseidon Principles for Marine Insurance Secretariat.
2. Portfolio climate alignment calculation can be performed by Signatories, ROs or other independent third parties (ie those that are not ROs).
3. The Signatory should provide the following information to the Secretariat in line with the requirements identified in Section 4: Transparency.

## Step 4: Disclosure

Step 4 establishes disclosure requirements that will serve as a quality control mechanism. Transparency is key to the last step of reporting. The information outlined below will be submitted to the Secretariat and made available only to Signatories with the aim of informing the actions of the Steering Committee. Information submitted under these requirements will not be made public. This is intended to establish a quality control mechanism for Signatories while also ensuring that information that may be regarded as sensitive by some Signatories is not publicly disclosed. There is one method, which is applicable to both the preferred and allowed pathway tracks.

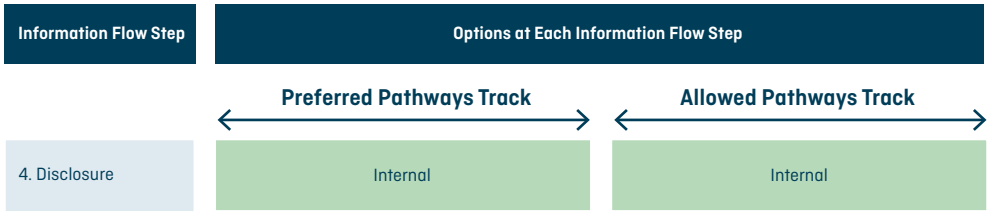



**Figure 12.**
Disclosure

## Reporting and disclosure

For the Poseidon Principles for Marine Insurance, reporting and disclosure is built upon two key elements: a) public commitments and b) internal disclosure.

In order to support both elements, the initiative uses learning from its predecessors, the Sea Cargo Charter and the Poseidon Principles for Financial Institutions.

**a.** The Poseidon Principles for Marine Insurance will mirror the Sea Cargo Charter (SCC), which commits that "Signatories will agree to work with owners and business partners to collect and process the information necessary to calculate carbon intensity and total GHG emissions and assess climate alignment".

**b.** The Principles for Marine Insurance will mirror the assessment steps used by the Poseidon Principles for Financial Institutions, which includes providing information for **internal disclosure**. This would mean that the total portfolio alignment score would be publicly disclosed, while additional information such as % non-reporting and % as the lead/follower insurer is disclosed amongst other Signatories only.

By setting the scope to report the entire H&M portfolio, initially where the Signatory is the lead insurer, the initiative promotes transparency and access to carbon emissions information, and commits to working with clients to support improvements over time. Internal disclosure amongst signatories allows for additional information to be shared at an aggregated level to build trust and improve reporting over time.

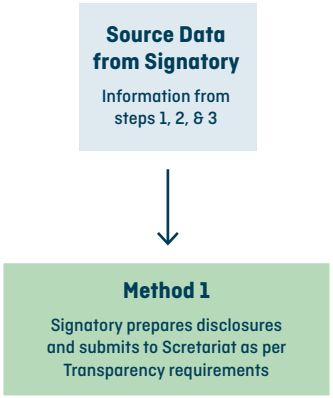



**Figure 13.**
Method for disclosure

## Method (preferred and allowed pathways):

Signatory prepares disclosures and submits to Secretariat.

1. If the Signatory is unable to collect data for some portion of its portfolio, the Signatory should calculate the percentage of its eligible shipping portfolio for which it cannot report. When calculating this percentage in terms of the share of vessel's deadweight insured, the Signatory should rely on the methodology outlined in Section 3.3.
2. The Signatory should calculate the percentages of its portfolio for which it used preferred and allowed pathway tracks. When calculating these percentages, the Signatory should rely on the methodology outlined in Section 3.3. The Signatory should also list the names of the providers (ie RO or third party) it used, if any, to complete steps 1, 2 and 3 (ie those steps identified in Sections 3.3.)
3. The Signatory should provide the following information to the Secretariat: percentage of eligible shipping portfolio non-reporting, percentages of portfolio for which preferred and allowed pathway tracks were used, where the Signatory is a lead/follower etc and a list of the names of providers it used, if any, to complete steps 1, 2 and 3.

### How to meet the requirements

The Signatory should provide the following information to the Secretariat in line with Transparency requirements identified in Section 4: percentage of eligible shipping portfolio non-reporting, percentages of the portfolio for which preferred and allowed pathway tracks were used and a list of the names of providers it used, if any, to complete steps 1, 2 and 3.

## Example of internal disclosure

In this example, a Signatory successfully completes the assessment of its portfolio climate alignment. In addition to reporting its portfolio climate alignment score to the Secretariat, it also reports the following information, which is demonstrated in Table 4 below: percentage of eligible shipping portfolio non-reporting, percentage of portfolio for which preferred and allowed pathway tracks were used, and a list of the names of providers it used, if any, to complete steps 1, 2 and 3. The information in Table 4 is not made public by the Secretariat.

Example:

| % Non-reporting | % of portfolio for which preferred pathway tracks used | % of portfolio for allowed pathway tracks used |
|---|---|---|
| 4% | 90% | 6% |
| **% leading / % following** | **Providers Used** | **% leading / % following** |
| 0 / 100 | 70 /30 | 50 / 50 |
| **Step** | **Providers used** | **Providers used** |
| 1 | Used RO x and y | N/A – data collected from owner |
| 2 | Used RO x and y | N/A – calculations performed internally |
| 3 | Used 3rd party Name Z | Used 3rd party Name Z |

**Table 4.**
Example of internal disclosure

NOTE: The % non-reporting refers to the % of WEIGHT METRIC in a portfolio that is within the scope of the Principles, but has non-reported, missing or incomplete data, rather than the % of ships non-reporting

## Standard Covenant Clause

Key to supporting the accurate assessment of climate alignment and to creating an equal burden on all Signatories is an enforcement mechanism that ensures that the appropriate data and information are provided by shipowners to Signatories, the appropriate consents are given for the sharing of data, the data is shared and appropriate privacy protections are established. This may include the sharing of data via a shared data platform or the data being provided by shipowners' commercial manager, depending on what is agreed between the shipowners and the Signatories.

To assist in the collection and sharing of data for the Poseidon Principles for Marine Insurance, there are two supporting documents:

1. A Standard Covenant Clause, to be included in policy agreements.
2. A form of letter to be sent by Signatories to shipowners to request the data.

The proforma clause and supporting definitions together with the form of letter are available from the Secretariat.

## How to meet the requirements

### Signatories

In all new and renewed Business Activities that are finalized after an insurance provider becomes a Signatory to the Poseidon Principles for Marine Insurance, the Signatory will use its best efforts to include the Definitions and Covenant wording set out in the covenant clause in the relevant documentation, amended, where necessary, to reflect the Signatory's proposed method of data collection.

### Specific guidance for Affiliate members

**Assessment**
*Affiliate members will, for each step of the assessment and as necessary, support Signatories by sharing knowledge about the Accountability principle and data collection process with relevant stakeholders, in line with the Technical Guidance.*

### Affiliate members

Affiliate members will agree to work with Signatories, shipowners, other marine insurance providers, brokers and business partners where possible, to support Signatories by sharing knowledge about the Enforcement principle and standardized clauses with relevant stakeholders, in line with the Technical Guidance.

**Examples:**

- **Brokers** – use their best efforts to inform and include the definitions and terms set out by the Principles (eg the standard clause in policy agreements) in order to support Signatories and clients in providing verified emissions information.
- **Associations, P&I clubs and membership groups** – use their best efforts to inform and educate member organizations, so that the practices, definitions and terms set out in the Principles become common practice across the industry

4

# Transparency

## PRINCIPLE

> We will publicly acknowledge that we are a Signatory to the Poseidon Principles for Marine Insurance, and we will publish the results of our assessment on an annual basis in line with the Technical Guidance.

## REQUIREMENTS FOR SIGNATORIES

Climate alignment scores will be published on an annual basis.

1. Upon becoming a Signatory or Affiliate member, the member will publicly acknowledge that it is a Signatory to or Affiliate member of the Poseidon Principles for Marine Insurance.
2. On an annual basis, each Signatory will report the overall climate alignment of its shipping portfolio and supporting information, as per the Accountability requirements, to the Secretariat no later than 30 November. This requirement takes effect for each Signatory in the calendar year after the year in which it became a Signatory.
3. On an annual basis, each Signatory will publish the overall climate alignment of its shipping portfolio in relevant institutional reports on a timeline that is appropriate for that Signatory. This requirement takes effect for each Signatory in the calendar year after the calendar year in which it became a Signatory.

# 4.1 Signatories: Information flow

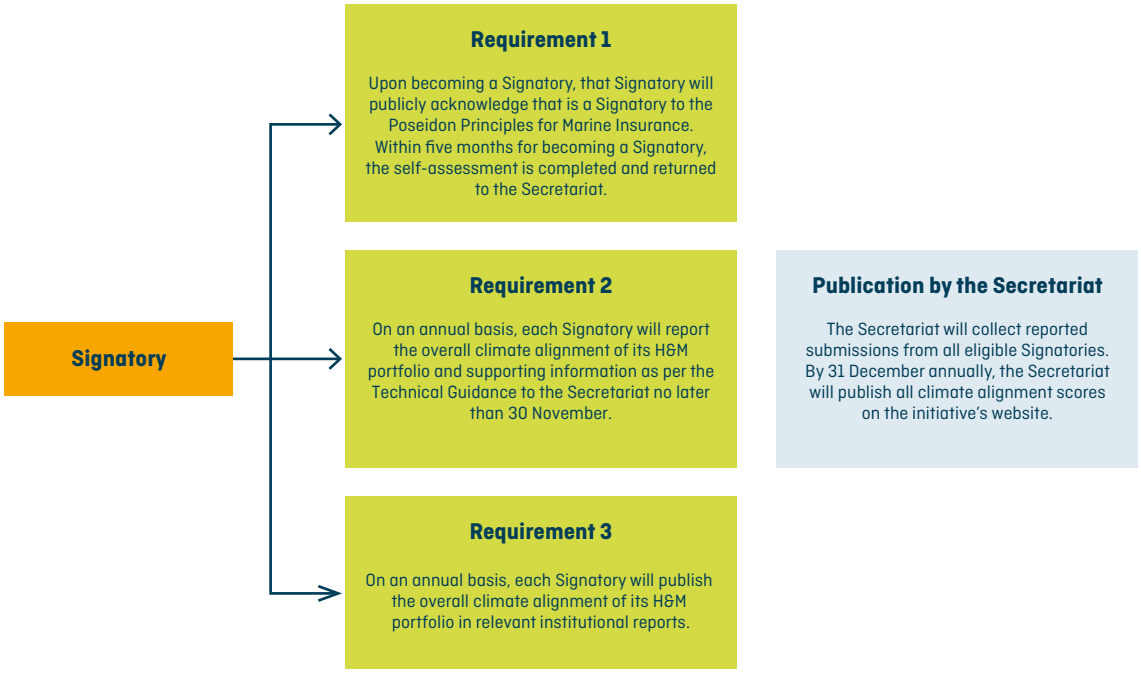



**Figure 14.**

## How to meet the requirements

1. The expectations of Transparency requirement 1 are that a Signatory or Affiliate member should make publicly known that it is a Signatory or Affiliate member in a manner that is suitable for its organization. The aim of this requirement is to simply ensure awareness of the Poseidon Principles for Marine Insurance and to ensure that it is clear which organizations are Signatories and supporters without creating any significant burden for them.
2. The expectations of Transparency requirement 2 are that a Signatory should report all required information to the Secretariat (climate alignment of portfolio and supporting information as per Accountability requirements) in a timely manner in accordance with the Assessment, Accountability and Enforcement, and Transparency Technical Guidance. The aim of this requirement is to ensure that accurate information can be published by the Secretariat in a timely manner. The required reporting timeline is intended to create as little burden as possible for Signatories.
3. The expectations of Transparency requirement 3 are that a Signatory should identify relevant institutional reports and ensure that the climate alignment of its shipping portfolio is included in them. Due to different institutional timelines, no specific expectations have been set for when reports including portfolio climate alignment scores should be published. The aim of this requirement is not to specify precisely when this information should be published or create a significant burden for Signatories. Instead, it is intended to ensure awareness of the Poseidon Principles for Marine Insurance and their approach.

### Specific guidance

- It is expected that Signatories' annual disclosure is included in relevant institutional reports on a timeline that fits their institution. This approach allows for flexibility and removes additional administrative burden across the institution.

## Worked example: Transparency

### For Signatories

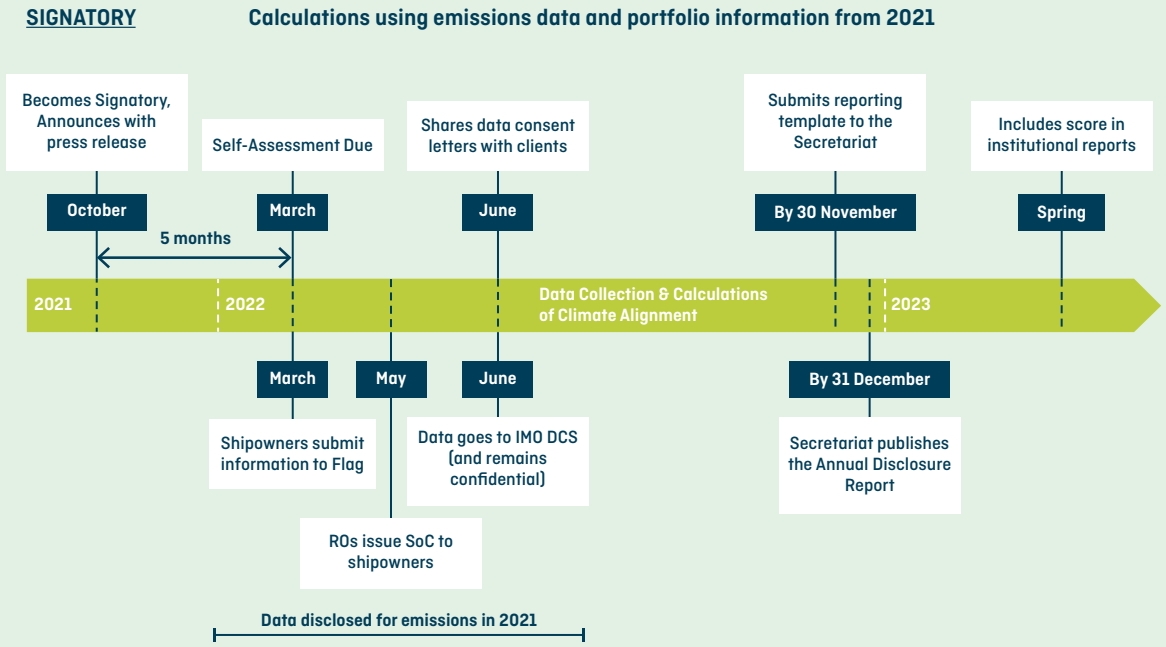
In this example, an insurer becomes a Signatory to the Poseidon Principles for Marine Insurance in October 2021.

**Requirement 1:** Insurer issues a press release announcing that it is a Signatory in October 2021. They complete the self-assessment no later than March 2022 and return the form to the Secretariat.

**Requirement 2:** Prior to 30 November 2022, the Signatory submits its portfolio climate alignment score (for the previous year, 2021) and supporting information, as per the Accountability requirements outlined in the Technical Guidance. The Signatory has a score of -1%, indicating that it is -1% below the decarbonization trajectory for the IMO target, and is +7% above the Paris Agreement trajectory.

**Requirement 3:** The Signatory includes its portfolio climate alignment score in its annual sustainability report in March 2023, in line with its internal requirements.

**Publication by the Secretariat**: All eligible Signatories and Affiliate members' 2021 climate alignment scores and statements of support are published online prior to 31 December 2022.



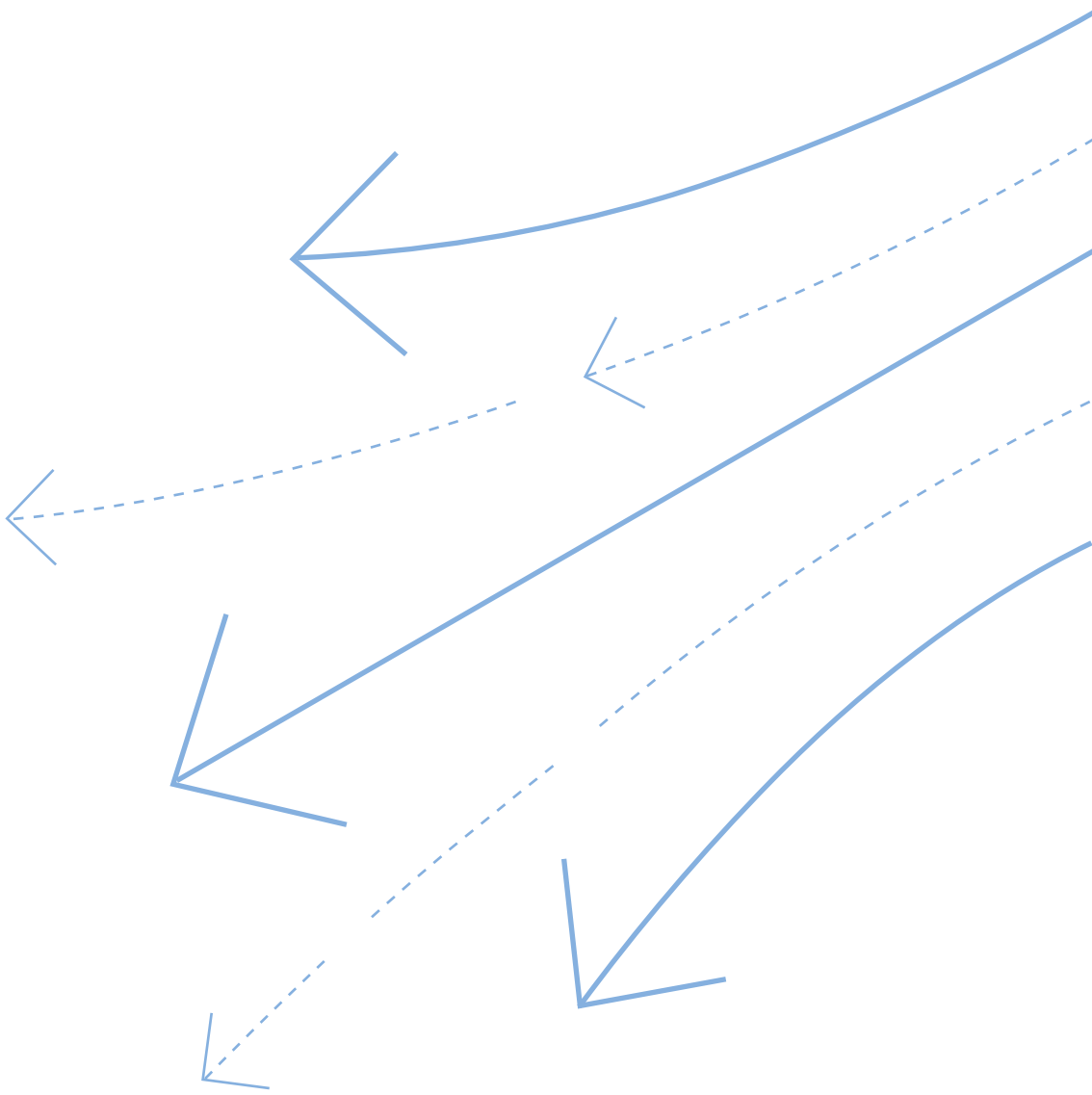
## Requirements for Affiliate members

1. Upon becoming an Affiliate member, the organization will publicly acknowledge that it is an Affiliate member of the Poseidon Principles for Marine Insurance.
2. On an annual basis, no later than 30 November, the Affiliate members will:

    a. Complete the annual self-assessment for Affiliate members, which includes public disclosure requirements for inclusion in the Annual Report;

    b. And include the disclosure requirements in relevant institutional reports on a timeline that is appropriate for that institution.

    The requirements in no. 2 take effect for each Affiliate member in the following calendar year in which it becomes a member.



# 4.2 Affiliate members: Information flow

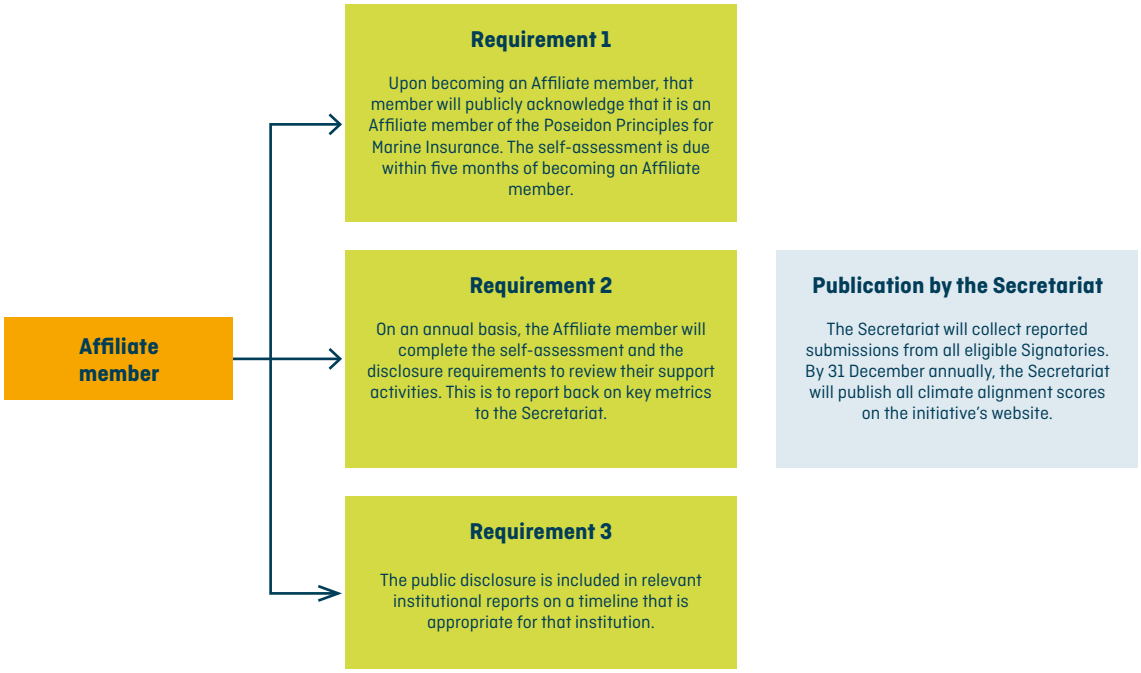



**Figure 15.**
Affiliate members: Information flow

## How to meet the requirements

Similar to the Signatories, the Affiliate members also have a Self-Assessment. The purpose is to ensure that the Affiliate member is prepared to support the process outlined in the Principles and have raised any questions or concerns with the Secretariat in good time. The Self-Assessment is due within five months of becoming an Affiliate member.

The expectations of Transparency requirements for Affiliate members are to provide internal reflection and evaluation of the role of the supportive institutions, and to publicly report on progress, in line with the Technical Guidance. These elements are to be included in relevant institutional reports on a timeline that is appropriate for that institution.

## Self-Assessment and disclosure requirements

The purpose of this self-assessment is to ensure that each member has made appropriate arrangements to fulfil its obligations under the Poseidon Principles for Marine Insurance and identified any potential challenges to doing so. To minimize administrative burden, it is as brief as possible while still addressing the core responsibilities of Affiliate members.

Affiliate members are required to publicly communicate on the ways in which they engage with and support the Poseidon Principles for Marine Insurance through the disclosure requirements. To minimize administrative burden, the overall format is flexible, so long as it adheres to the requirements and is included in relevant institutional publications.

The self-assessment questions and disclosure requirements both focus on ensuring that members are aware of timelines and obligations under the Poseidon Principles for Marine Insurance, have engaged the appropriate internal stakeholders, have engaged clients and have a plan for engaging with the initiative through the implementation of practical actions.

**Requirements for disclosure**

Affiliate members are also required to report on activities and the efforts made by them every year. Each disclosure report must include all of the following elements:

- A statement by the chief executive or equivalent expressing continued support for the Poseidon Principles for Insurance and renewing the participant's ongoing commitment to the initiative and its principles.
- A description of the practical actions that the organization has undertaken to support the Poseidon Principles for Insurance and to engage with the initiative. Practical actions should relate to one or more of the specific activities suggested to each type of participant in support of the initiative.
- Measurement of outcomes (ie qualitative or quantitative measurements of results).
- As with the requirements for Signatories, no specific expectations have been set for when reports should be published. The aim of this requirement is to ensure awareness among Affiliate members so that they include and support the Principles for Marine Insurance in their regular business activities as appropriate for their institution.

The Transparency requirements are not intended to be static – it is hoped that the assessments will improve over time with increasing transparency and access to reliable data sources for these stakeholders.

## Worked example: Transparency

### For Affiliate members

In this example, a broker becomes an Affiliate member of the Poseidon Principles for Marine Insurance in October 2021.

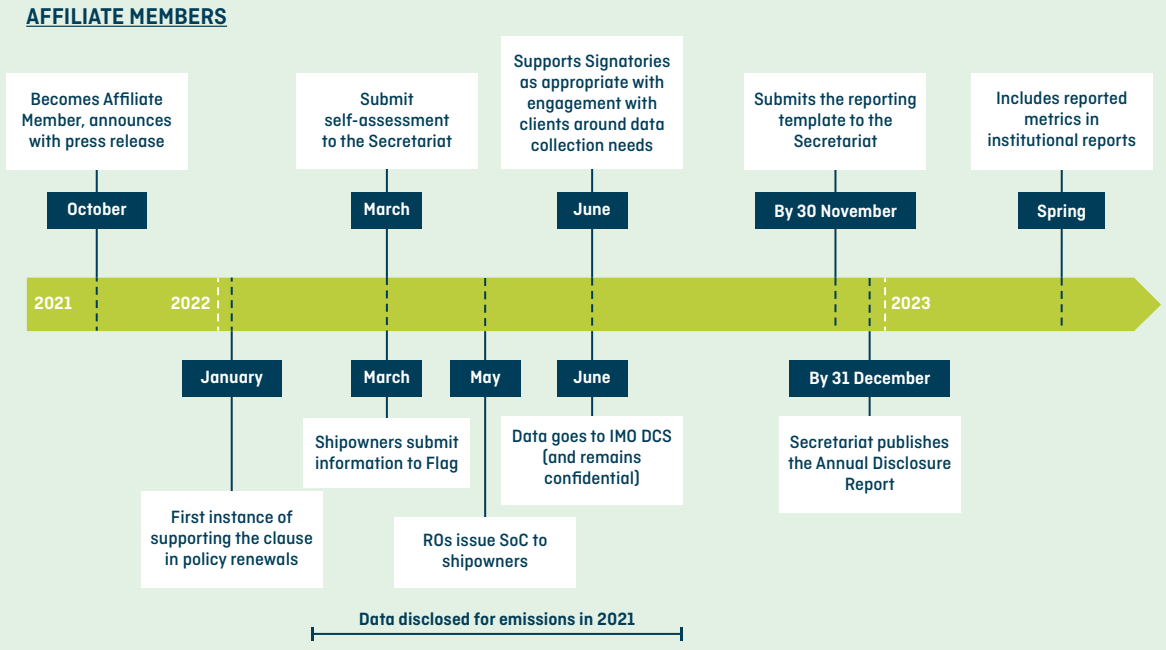
**Requirement 1:** Institution A, a marine broker, issues a press release announcing that it became an Affiliate member in October 2021. By March 2022, it has completed the self-assessment and returned it to the Secretariat.

**Requirement 2:** Prior to 30 November 2022, the Affiliate member submits its completed self-assessment and public disclosure requirements to the Secretariat.

This year, its Head of Marine provided a quote, expressing their support and inviting other brokers to join the initiative. The description of activities included an additional summary of an event hosted by the institution to educate members on the wording of the clause. As a concrete outcome of this event, two potential Signatories expressed their interest in joining the initiative, and one has already finalized the onboarding. The institution has also decided to become involved in one working group of the Poseidon Principles for Marine Insurance, to increase data transparency in an area of interest.

**Requirement 3:** The public disclosure elements are included in the institution's annual sustainability report in March 2023, in line with its internal requirements.

**Publication by the Secretariat:** All eligible Affiliate members' 2021 reported metrics and statements of support are published online prior to 31 December 2022.



5

# How to become a Signatory

The following outlines the process for insurance providers to become Signatories and highlights the necessary documents.

This document is intended to be a how-to guide for the administrative aspects of implementing the Principles by proposed Signatories.

Insurers wishing to become a Signatory to the Poseidon Principles for Marine Insurance must adhere to the following process:

1. Using the Standard Declaration and Signatory Application provided by the Secretariat, an insurance provider wishing to become a Signatory must complete and send both documents to the Secretariat.
2. The insurance provider must complete and submit the Poseidon Principles Self-Assessment to the Secretariat within five (5) months of becoming a Signatory.
3. Institutions wishing to become an Affiliate member of the Poseidon Principles for Marine Insurance must adhere to the following process:
4. Using the standard declaration and application provided by the Secretariat, an institution wishing to become an Affiliate member must complete and send both documents to the Secretariat.

## Standard Declaration

The Standard Declaration is the formal commitment required of an insurance provider to become a Signatory. Step one of the process, the Declaration, announces the intention of the insurance provider to follow all legally binding requirements of the Principles. This means that the insurance provider is prepared to take the necessary steps to comply with all four Poseidon Principles, and have this commitment and related reporting made public.

Standard Declaration for Affiliate Members is the formal commitment required for an institution wishing to become an Affiliate member of the Poseidon Principles for Marine Insurance. It announces the public support of the initiative and prepares the institution for supporting Signatories and the implementation of the Principles. There is one declaration for all organizations: brokers, P&I Clubs, associations etc. Please contact the Secretariat with any questions.

## Signatory Application

Along with the Standard Declaration, the insurance provider that wishes to become a Signatory must also complete the Signatory Application document. This document outlines who is responsible for contacting, reporting, invoicing and other necessary functions so that the Poseidon Principles are implemented and maintained by the insurance provider.

Affiliate members also complete the application, as the contact and functional information is necessary for the Secretariat to maintain contact.

## Self-Assessment

Upon becoming a Signatory, each Signatory has five (5) months to complete this Self-Assessment and return it to the Poseidon Principles Secretariat.

The purpose of this is to ensure that each Signatory has made appropriate arrangements to fulfil its obligations under the Poseidon Principles and identified any challenges to doing so. The Self-Assessment is as brief as possible to reduce the administrative burden, while still addressing the core responsibilities of Signatories to the Poseidon Principles.

The questions in the Self-Assessment ensure that Signatories are aware of timelines and obligations under the Poseidon Principles for Marine Insurance, have engaged internal stakeholders, have engaged clients and have a plan for engaging the necessary service providers so that they can complete their climate alignment assessment.

Affiliate members also have a Self-Assessment to complete. The requirements are outlined in Section 4.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# Appendices

Appendix 1

# Definitions and abbreviations

**AER** means the Annual Efficiency Ratio, a carbon intensity metric calculated in accordance with Equation 1 as set out in Section 2.1 of the Technical Guidance.

**Affiliate members** are stakeholders which support and contribute to the insurance ecosystem, but whose current business activities fall out of the reporting scope. Affiliate membership is open to organizations including insurance brokers and collective groups (such as insurance associations, unions and P&I Clubs).

**Business Activity** is defined as insurance policies which fall within the scope – insurance products which cover H&M, and where the insurer is the lead and has access to the required data from clients. This scope may be amended or expanded by Signatories in the future as per the annual review process.

**Carbon intensity** in shipping represents the total operational emissions generated to satisfy a supply of transport work (grams of $CO_2$ per tonne-nautical mile [$gCO_2$ / tnm]).

**CDP** is the Carbon Disclosure Project, a not-for-profit charity that runs a global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts.

**CII** are carbon intensity indicators, an operational measure considering the actual consumption and distance travelled for each individual ship in service.

**Climate alignment** is the degree to which a vessel, policy or portfolio's carbon intensity is in line with decarbonization trajectories that meet the IMO ambition of reducing total annual GHG emissions by at least 50% by 2050 based on 2008 levels, or a 100% reduction target to support the Paris Agreement.

**$CO_2$** is carbon dioxide.

**$CO_{2e}$** are carbon dioxide equivalents.

**DWT** is defined as the maximum deadweight of the ship and measure of the ship's carrying capacity. It takes into consideration the weight of the cargo on board, fuel, ballast water, fresh water, crew, provisions for the crew.

**DWT * share**: portion of vessel's DWT which is covered by the specific insurance provider. This is the chosen weighting metric for the PPMI

**EEDI**, or Energy Efficiency Design Index, was developed by the IMO to measure technical standards and promote the use of more energy efficient and less polluting equipment and engines in newbuilds, and requires a minimum energy efficiency level per capacity mile.

**EEOI** is the Energy Efficiency Operational Indicator, developed by the IMO in order to allow shipowners to measure the fuel efficiency of a ship in operation.

**EEXI**, or the Energy Efficiency Existing Ship Index, was developed by the IMO in order to align technical standards for both existing ships and newbuilds.

**GHG** means Greenhouse Gas.

**IMO** is the International Maritime Organization, a specialized agency of the United Nations, and the global standard-setting authority for the safety, security and environmental performance of international shipping.

**IMO DCS** is the IMO's MARPOL Annex VI Data Collection System for Fuel Consumption.

**Insured value** is the amount covered for a specific vessel by the policy

**Insured value * share** is the portion of a vessel's insured value covered by the specific insurance provider, when there are multiple insurers providing coverage to the same client

**Net Zero Insurance Alliance, or NZIA**, brings together eight of the world's leading insurers and reinsurers to play their part in accelerating the transition to net-zero emissions economies.

**Policy**, for h&m coverage, refers to one unit of a marine insurance product transaction or deal that covers physical damage to vessels

**RO**, or registered organization, is an authorized organization that performs statutory requirements on behalf of a vessel's flag state. While normally a Classification Society, in the case of the IMO DCS, independent verifiers have been authorized by some flag states.

**Signatory** is an insurer that has sent a formal declaration to the Secretariat, has had that declaration accepted and has had that declaration announced.

**Share** is the percentage insured by the specific insurance provider, when there are multiple insurers providing coverage to the same client.

**TCFD** is the Task Force on Climate-related Financial Disclosure, a task force set up to develop recommendations for voluntary climate-related financial disclosures that provide useful information to lenders, insurers and investors.

**TEU** means Twenty-foot Equivalent Unit, a unit of cargo capacity often used to describe the capacity of container ships.

**Third Parties** are independent parties contracted to support the implementation of the Principles (ie those that are not ROs).

**TNM** refers to tonne-nautical mile

**UNEPFI PSI** was launched at the 2012 UN Conference on Sustainable Development, the UNEP FI Principles for Sustainable Insurance serve as a global framework for the insurance industry to address environmental, social, and governance risks and opportunities.

**Verification Letter** issued by a Recognized Organization may be accepted in lieu of an SoC, where such a Verification Letter expressly states the vessel's identification, reporting period relating to the IMO DCS, and is duly signed.

**Voyage** is including the time spent in port for vessels sailing in international waters, as outlined by the IMO DCS requirements.

Appendix 2

# Selecting a carbon intensity metric

There are a number of different carbon intensity metrics that have been proposed, both in IMO discussions and in the private sector, but no single metric on operational carbon intensity has been mandated by the IMO or used to define the carbon intensity goal in the IMO Initial Strategy. There are only suggestions made in the guidelines.

Carbon intensity measures considered for the Poseidon Principles for Marine Insurance are the Energy Efficiency Operational Indicator (EEOI) and the Annual Efficiency Ratio (AER) which are two measures developed by, or being proposed to, the IMO. The following provides a summary of their differences:

1. **The Energy Efficiency Operational Indicator (EEOI)**
   - **a.** This requires information including the $CO_2$ emissions, the distances sailed whilst doing transport work and the amount of cargo (or passengers or gross tonnage) carried.
   - **b.** The EEOI produces the closest measure of the vessel's true carbon intensity.

2. **Annual Efficiency Ratio (AER)**
   - **a.** AER is similar in form to EEOI but uses an approximation of cargo carried by utilizing the vessel's designed deadweight (or Twenty-foot Equivalent Unit (TEU) or passenger or gross tonnage) capacity in place of actual cargo carried and assumes that the vessel is continuously carrying cargo.
   - **b.** Because ships are not always fully utilized in terms of capacity and many ships (eg tankers and bulkers) operate with ballast voyages where for several voyages a year they have no cargo, this method typically underestimates carbon intensity.

The drafting group also considered a third method:

3. **Hybrid approach**
   - **a.** A hybrid approach is used, where EU MRV data (EEOI) is used for vessels trading 100% of the time on voyages that include EU Member States.
   - **b.** IMO DCS is used for the rest to calculate AER and translate it into an EEOI metric using an assumed default value for cargo utilization (i.e. 60%).

Different metrics place different requirements on the data that is needed in their calculation. To ensure consistency in the application of the Principles and ensure that an apples-to-apples comparison between the calculations can be made by the Signatories, it is important that all Signatories apply the same single metric.

| Measure | Pros | Cons |
|---|---|---|
| **EEOI** | • True measure of transport work included | • Requires additional data to be collected (cargo) that is not collected through the IMO DCS |
| **AER** | • Only fuel consumption and distance sailed need to be measured<br>• Aligned with IMO DCS | • Not a true measure of transport work. Assumes all vessels are sailing continuously with loaded cargo on all voyages |
| **Hybrid approach** | • EEOI is the most theoretically correct measure, and combining the metric allows for this advantage.<br>• Potential to increase ambition at the IMO, but goes beyond the current data collection of the IMO DCS | • Currently misaligned with the Poseidon Principles for Financial Institutions<br>• Relies on default utilization rates for all voyages that exclude EU (i.e. all ships travelling between the US and China, a major route, would be excluded)<br>• More effort for the Signatories and their insured shipowners<br>• Large portion of vessels in scope will need to go through estimation from AER to EEOI, which compromises accuracy |

**Table 5.**
Comparison of EEOI, AER vs hybrid approach

Appendix 3

# Selecting a weighting metric

In order to ensure that this initiative remains in line with the intention to connect an individual Signatory's business activities to climate impact/exposure of such activities, several possible weighting metrics have been explored:

1. The share of vessel's deadweight insured as a portion of the total deadweight insured (DWT*share, the chosen metric).
2. The share of vessel's Hull & Machinery insured value as a portion of the total H&M insured value.
3. The vessel's gross premium written by an insurer before deductions as a portion of the total gross written premium.

Factors considered in the choice of the weighting metric include complexity of calculations, accuracy of climate alignment score and potential applicability to other stakeholders in the marine insurance space.

The first option, the share of vessel's deadweight insured, is a proxy for the share of vessels' transport work, measuring the environmental impact of a portfolio. It is comparable to the weighting metric used by the Sea Cargo Charter, which uses transport work. This was the metric chosen for the Poseidon Principles for Marine Insurance to allow for the methodology to be easily extended to additional Signatories and stakeholders within marine insurance over time. This perspective allows for greater transparency and leadership from the marine insurance sector.

The second option, the share of vessel's Hull & Machinery insured value, measures the financial exposure and represents the economic magnitude of a portfolio. However, the fluctuations in the market and insurance rates would have impacted the interpretation of the scores year-by-year. Furthermore, it would limit the expansion of the scope to a wider group of stakeholders over time.

The third option, the gross written premium, is the metric most closely connected to the financial exposure of the asset. However, this could lead to the wrong incentives for decarbonization in the long run (i.e. higher premiums for less polluting vessels).

| DWT * share | H&M insured value * share | Gross written premium *share |
|---|---|---|
| **Rationale**<br>Mimic the transport work * share to serve as a proxy for transport work to measure **environmental impact** | **Rationale**<br>Mimic the premium * share to serve as a proxy for f**inancial exposure or economic magnitude** | |
| ☑ Objective in the sector<br>☑ Can be used by other stakeholders to expand the scope of Signatories over time<br>☑ Allows for the inclusion of P&I club coverage<br>☑ Easy to adopt, no need to collect historical information (except for the share insured, which is taken from the Signatory's internal data)<br>☑ *Comparable to the weighting metric used by the Sea Cargo Charter, which measures emissions of transport work*<br>☒ Bias showing in the outcome because of different units of carbon intensity for ships (DWT vs GT)<br>☒ It may **underestimate** carbon emissions of delta alignment, whereas using GT **overestimates** carbon emissions | ☑ Objective among insurers<br>☑ Can be adjusted and replicated across lines of business<br>☑ Easy to adopt<br>☑ Incorporates a financial metric<br>☑ *Comparable to the weighting metric used by the Poseidon Principles for Banks, which measures climate risk*<br>☒ Market fluctuations, which are not a huge limitation<br>☒ Similar ships might have different insured value (ie depending on age, mortgage, place of build etc)<br>☒ **Does not allow for the inclusion of P&I** | ☑ It captures financial exposure<br>☑ Incorporates a financial metric<br>☑ Aligned with the methodology proposed by CRO forum<br>☒ Market fluctuation<br>☒ May lead to wrong incentivisation<br>☒ Might be sensitive information to disclose<br>☒ Subjective (different for each insurer)<br>☒ Problem with high deductibles |

**Table 6.**
Comparison of weighting metrics

# Appendix 4

## A note on the following trajectories

The 50% Reduction Trajectory refers to the same global trajectory used by the Poseidon Principles for banks, which takes the IMO Absolute Target and converts it into a relative (carbon intensity) target.

The 100% Reduction Trajectory is not by definition aligned with a 1.5-degree global temperature stabilization goal, partly because it does not include all greenhouse gas emissions such as methane and does not account for upstream emissions. Stabilization below a specific temperature threshold is a function of cumulative (total) emissions over a time period (e.g., to 2050), with each sector ensuring that it does not exceed a specific share of those cumulative GHG emissions. The aim of this work is not to define precisely what cumulative budget or sectoral share of that budget shipping should follow, but to identify a pathway that is proportionate to broader efforts to achieve zero GHG emissions no later than 2050.

A trajectory in line with net-zero commitments by 2050, including the NZIA, will be introduced once available (e.g. from the Science Based Targets initiative).

# Calculation of decarbonization trajectories

## 2020 Poseidon Principles Methodology (Version 4.0)

### Calculation of decarbonization trajectories per ship type and size class

The following describes the method applied for establishing the target carbon intensity for a given ship type and size class in a given year. This is carried out by calculating a decarbonization-consistent carbon intensity trajectory from 2012 to 2050. The method is derived from IMO Secretariat-commissioned data sources - the Third IMO GHG Study and the Fourth IMO GHG Study. Assumptions for formulating the trajectory are also taken from the Initial IMO GHG Strategy.

### Ship type and size definitions:

Carbon intensities vary as a function of ship type and size, as well as a ship's technical and operational specification. To enable the carbon intensity of ships to be compared to a peer group of ships of a similar type and size, a classification system is applied. The classification system is taken from the Fourth IMO GHG Study[9], to enable consistency with the IMO's process. Full details of the definitions can be found in that document. See the section on Revisions to the Poseidon Principles Trajectories for more information about the revisions to the classification system.

### Estimating the ship type and size-specific carbon intensity:

The baseline year for the trajectories is 2012, consistent with the Poseidon Principles methodology used to calculate Signatories' climate alignment for 2019 ("the 2019 Poseidon Principles").

9 Jasper Faber, Shinichi Hanayama, Shuang Zhang, Paula Pereda, Bryan Comer, Elena Hauerhof, Wendela Schim van der Loeff, Tristan Smith, Yan Zhang, Hiroyuko Kosaka, Masaki Adachi, Jean-Marc Bonello, Connor Galbraith, Ziheng Gong, Koichi Hirata, David Hummels, Anne Kleijn, David S. Lee, Yiming Liu, Andrea Lucchesi, Xiaoli Mao, Eiichi Muraoka, Liudmila Osipova, Haoqi Qian, Dan Rutherford, Santiago Suárez de la Fuente, Haichao Yuan, Camilo Velandia Perico, Libo Wu, Deping Sun, Dong-Hoon Yoo and Hui Xing. 2020, Fourth IMO Greenhouse Gas Study. International Maritime Organization, London, UK.

## Estimating the carbon intensity improvement required across all ship types:

The overall (all ship type and size categories included as international shipping) improvement required in carbon intensity is calculated from:

1. A projection of the foreseeable growth in transport work across all ship types between baseline (2012) and the target year (2050)
2. The target $CO_2$ emissions in 2050

The projection of foreseeable growth is taken from the Fourth IMO GHG Study scenario RCP 2.6 SSP2. This scenario is selected because it is the most aligned with decarbonization in the wider economy, and most closely represents the rate of GDP and trade growth that has been observed in recent years (between 2012 and 2018). For each scenario, the Fourth IMO GHG Study employed two models for projecting transport work for non-energy products10: a logistics model which analyses the relationship between global transport work and its drivers using historical data to project transport work; and a gravity model, which presumes that transport work is a function of per capita GDP and population of the trading countries and uses econometric techniques to estimate the elasticity of transport work with respect to its drivers. The results show that for most scenarios, including RCP 2.6 SSP2, the logistics model approach results in higher transport work projections than the gravity model approach. The logistics model approach was chosen as it represents an upper bound on the transport work projection and therefore is more conservative, allowing international shipping to meet its decarbonization targets if transport work is higher than forecasted under the gravity model but within the upper bound set by the transport work assumed in the logistics model.

The estimate of the target $CO_2$ emissions in 2050 is taken by applying the IMO's Initial Strategy Objective 3 minimum target (at least a 50% reduction), to the IMO Initial Strategy's baseline year (2008) total $CO_2$ emissions (921Mt), taken from the Third IMO GHG Study. It should be noted that as indicated by the wording "at least", this currently represents the minimum level of ambition and therefore the maximum absolute emissions and least ambitious aggregate carbon intensity. The estimate of 2012 emissions is taken from the Fourth IMO GHG Study11. Values for the total transport demand, total $CO_2$ emissions, and aggregate carbon intensity in 2008, 2012 and 2050 are given in Table 5 12.

10 For a description of the full methodology employed to project transport work including energy products, see page 259 of the Fourth IMO GHG Study.

11 The $CO_2$ emissions shown in Table 5 are for total international shipping emissions, and, as such, include sectors which are measured in gross tonnage units (eg Cruise, Vehicle and some Ferry-RoPax and Ferry-pax only). These sectors are included in order to maintain consistency with the method employed in the 2019 Poseidon Principles Technical Guidance, which is also consistent with how the 2008 $CO_2$ emissions have been obtained for international shipping. International carbon emissions were 7% higher in 2012 in the Fourth IMO GHG Study than in the Third IMO GHG Study.

12 The source for transport demand is taken from the Fourth IMO GHG Study rather than UNCTAD, which was previously used to estimate historical transport demand for 2008 and 2012.

| | 2008 | 2012 | 2050 |
|---|---|---|---|
| Total transport demand (billion tonnes) | 46 003 | 54 077 | 119 429 |
| Total $CO_2$ emissions (million tonnes) | 921 | 848 | 460.5 |
| Estimated aggregate carbon intensity ($gCO_2$/tnm) | 20.0 | 15.7 | 3.9 |

**Table 7.**
Estimate $CO_2$ targets

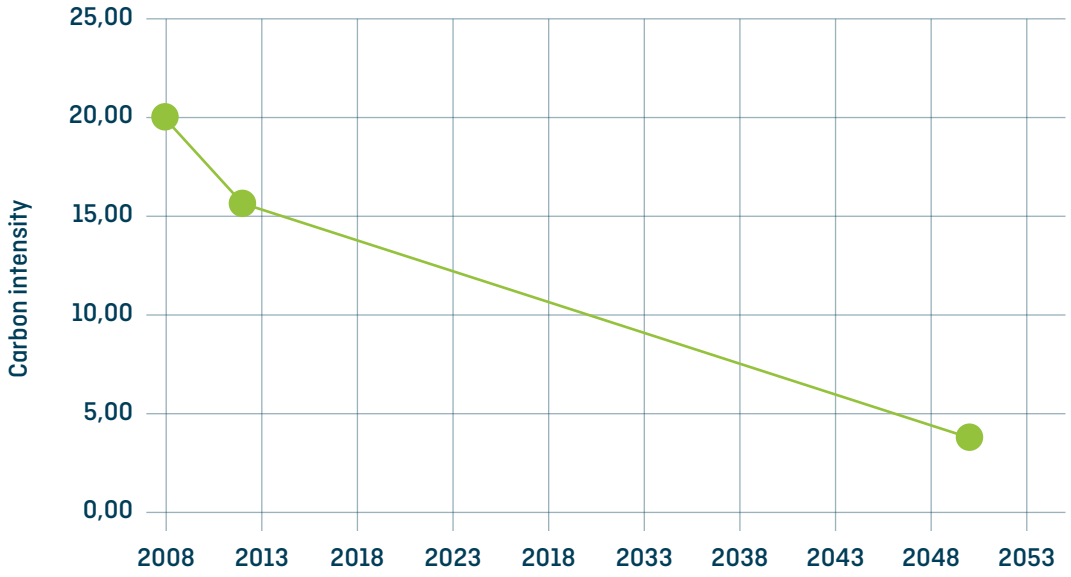


**Figure 16.**
Global carbon intensity trajectory

The 2012–2018 trend of carbon intensity consistent with Table 5 showed that carbon intensity reduced by about 10%. This reduction is aligned with the revised trajectory, which requires about a 12% decline in carbon intensity over the same period. This provides a justification for keeping the 2012 baseline, while maintaining the historical data and consistency with the baseline from the 2019 Poseidon Principles (Version 3.0).

Figure 17 plots the carbon intensity values in Table 5 and a linear trend line connecting them. There are many different assumptions that could be applied to specify the shape of the curve that defines the rate of carbon intensity reduction between 2012 and 2050. However, there is no strong justification for one or another. The chosen trajectory represents a gradual and consistent rate of improvement on average across the fleet; the assumption applied here is for a constant improvement year-on-year, which is described by a straight line between 2012 and 2050.

The Poseidon Principles trajectory is more ambitious than the IMO Initial Strategy Objective 2 intensity reduction values of 40% (2030) and 70% (2050), because it has been devised to ensure that the IMO Initial Strategy Objective 3 (the absolute emissions objective) is achieved. Meeting Objective 3 ensures that all IMO Initial Strategy Objectives are achieved. As it stands, the trajectories do not account for projected efficiency or alternative fuel technology uptake by the industry and are not designed to forecast any changes in operating profile. The linear nature of the trajectories provides a method by which to overcome uncertainty introduced by projections relating to technology uptake or operational variation.

## Calculating the target carbon intensity, corrected to AER, in a given year as a function of the ship type and size class

The rate of reduction required per year is relative to the last historical data point (2012). The trajectory is shown relative to 2012 global cargo carbon intensity (indexed to 2012 carbon intensity) in Figure 18.

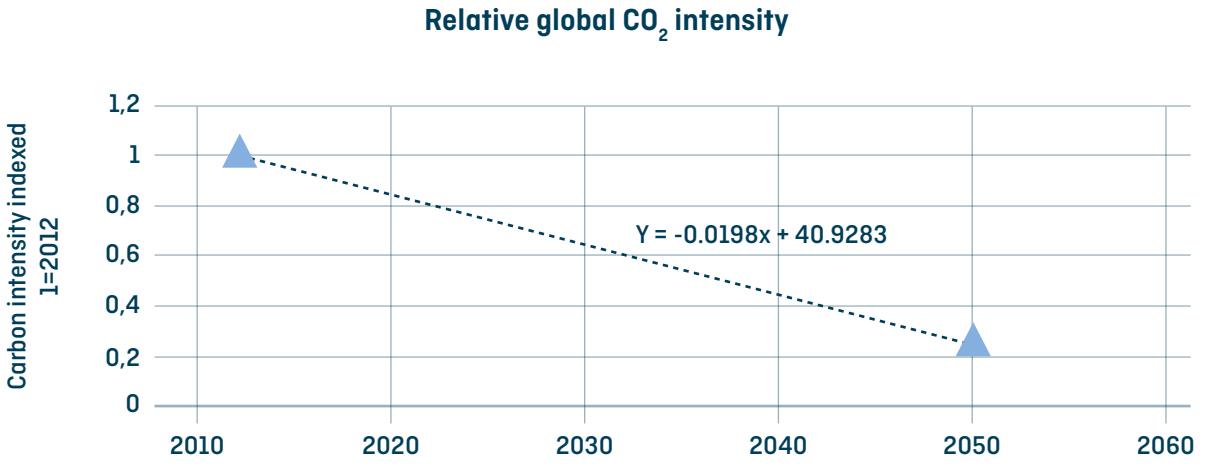


**Figure 17.**
Indexed decarbonization trajectory, 2012–2050

While the trajectory is presented for the time period 2012 to 2050, it is consistent with the 2008 baseline year as specified in the IMO Initial Strategy Objectives as the end point is determined by a 50% reduction relative to the baseline. The formula for the trajectory is given in Figure 18, and allows the index value to be calculated for a given year. [13] The index value represents the required carbon intensity value relative to the carbon intensity in 2012.

13 The slope and intercept are rounded to the nearest four decimal places, calculated using the index values for 2012 and 2050.

The index currently chosen for the Poseidon Principles is AER for cargo-carrying ships which use deadweight to measure their capacity and cgDIST [14] for ships measured in gross tonnage. The latter category includes Cruise, Ferry Ro-Pax, Ferry-pax only and Vehicle carriers. Each of these ship types has its own decarbonisation trajectory used to determine the trajectory values in Table 9.

The trajectory value for a given year is calculated in the following manner:

1. Calculate carbon intensity index for the given year
2. Multiply the carbon intensity index by the median 2012 AER value per ship type and size

The fleet type and size category median values in 2012 are included in Table 9. The AER and cgDIST trajectory values have been calculated for the years 2020–2023 and are included in Table 9. Note that for the smallest bin size, there are ships of gross tonnage of less than 5 000 GT which would be excluded from IMO DCS. Therefore, a filter of 5 000 GT and above was applied on a case-by-case basis based on the trade-off between sample size and the difference in AER between the sample with all gross tonnage (including ships of less than 5 000 GT) and the filtered sample. The filter was applied to Liquified Gas Tankers (0-49999 cbm) and Ro-Ro (0-4999 dwt).

## Revisions to the Poseidon Principles Trajectories

Revisions to this technical guidance took into account the following factors:

- The Fourth IMO GHG Study (published in 2020) updates the carbon intensity estimates for 2012 used in the 2019 Poseidon Principles version, the size categories per ship type and size, and future projections of transport demand for 2050.
- The developments leading up to MEPC 76 in terms of the carbon intensity metrics chosen for ship types that use gross-tonnage (eg Cruise).

The Fourth IMO GHG Study improved its methodology for estimating carbon emissions, and estimated the carbon intensity of ships in the world fleet and per ship type and size category. Various carbon intensity metrics were estimated including EEOI, AER and cgDIST for the period 2012–18. The Study also used a different methodology for projecting transport demand. Overall, the revisions made to carbon emissions were as a result of an improved methodology[15], while transport demand projections took account of recent trends in the relationship between maritime trade and its drivers (eg macroeconomic indicators) and the different models used. This impacted the steepness of the global cargo decarbonisation trajectory, which can mostly be explained by a lower transport demand projection. Figure 19 shows a comparison of the 2019 Poseidon Principles global cargo decarbonisation trajectory and the revised 2020 Poseidon Principles (Version 4.0) global cargo decarbonisation trajectory.

14 cgDIST is $CO_2$/GT*nm, the same formula as AER, except gross tonnage is used in place of deadweight in the denominator of Equation 1.

15 See page 184 of the 4th IMO GHG Study for a comparison between the Third and Fourth GHG Studies.

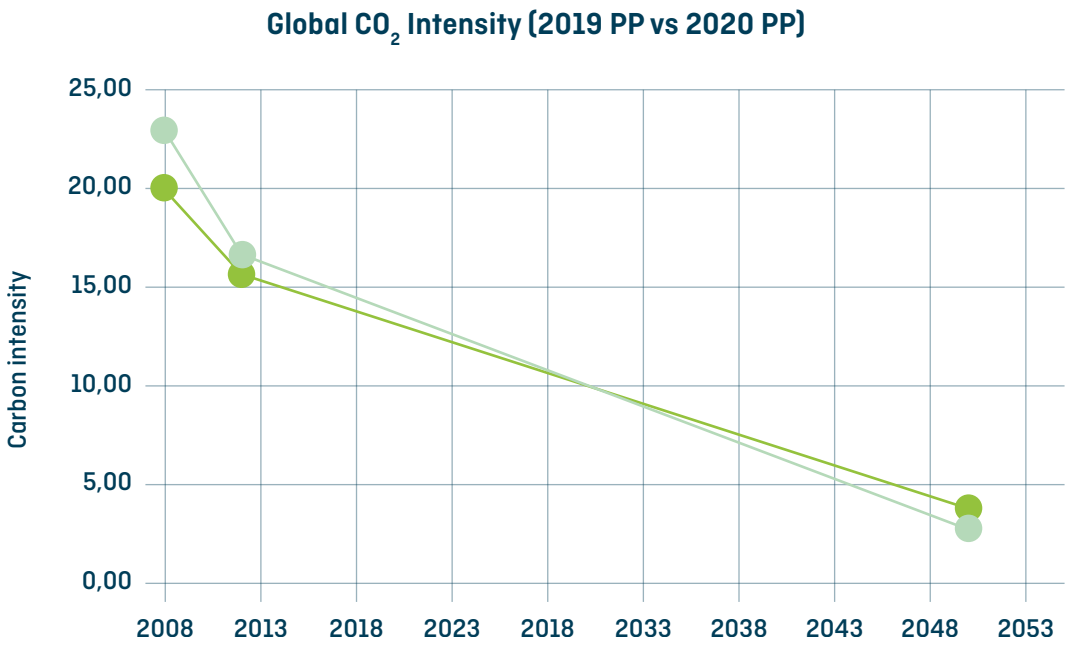


**Figure 18.**
A comparison of the global carbon intensity trajectory between the 2019 Poseidon Principles (Version 3.0) and 2020 Poseidon Principles (Version 4.0)

The Fourth IMO GHG Study also updated the size bins per ship type to take into account the development of the fleet between 2012 and 2018 whilst also considering future fleet development. This had the effect of breaking out larger size ranges used in the Third IMO GHG Study into smaller size bins.[16]

In the 2019 Poseidon Principles (Version 3.0), the carbon intensity of three ship types – Cruise, Ferry Ro-pax and Ferry Pax-only, were measured in $CO_2$/GT, which are better measured using a volumetric proxy as they carry passengers. Various proposals submitted to the IMO in advance of the MEPC 76 meeting have recommended the use of cgDIST for these ship types, as well as Vehicle carriers which are also measured in GT units in the Fourth IMO GHG Study. The Poseidon Principles have adopted this metric as it controls not only for the different capacity units but also the distance travelled. Therefore, separate global decarbonisation trajectories are provided for these four ship types to determine the global index values.

16 See Table 8 in the 4th IMO GHG Study for a mapping of size bins from the 3rd IMO GHG Study to the 4th IMO GHG Study.

## Future potential revisions to the Poseidon Principles

Over the timescale that the decarbonization trajectories are estimated, a number of the parameters that are used in their calculation may change.

These include:

- The IMO may modify the levels of ambition of its initial GHG reduction strategy, including when the IMO revises its strategy (expected 2023) (eg if the objectives increase in ambition, the carbon intensity trajectory will steepen). Or, the Poseidon Principles Association may decide to take a different view of the IMO's strategy, or align to different levels of ambition from the IMO.
- Adopting a continuous curve approach to model the relationship between size and AER for each ship type, which would adjust the 2012 baseline (upwards or downwards) if the ship's size differs from the median ship per ship type (eg if the ship is larger than the median ship, the decarbonisation trajectory value would be more stringent).
- The IMO may develop exemptions or correction factors in the short-term measure to take into account the special nature of certain ship types' operations (eg ice-classed ships).
- Subsequent IMO GHG studies (released about every five years) and subsequent studies may update or modify the estimates of the historical carbon intensity and carbon intensity trends (e.g., if historical estimates are revised upwards, the carbon intensity objective will steepen).
- Transport demand growth may develop differently from the estimate used here to calculate the carbon intensity trend consistent with a 2050 absolute GHG objective (eg if demand growth exceeds the trend used in these calculations, the carbon intensity objective will steepen).
- Demand growth may develop differentially between ship types and increase the demand for ships with different carbon intensity than the 2012 fleet (eg if demand modifies the fleet composition to increase the share of emissions by ships which have higher carbon intensity, the carbon intensity objective will steepen).

While the decarbonization trajectory and the ship type and size-specific trajectory values have been calculated using the best available data, there are a number of foreseeable reasons why these values may need to change in the future. For this reason, it is proposed that decarbonization trajectories are reviewed at a minimum every five years, approximately consistent with the periodic release of new analysis (the IMO GHG Studies). Any updates to the decarbonization trajectories should be applied for future climate alignment, not for re-analysis of historical climate alignment.

| 50% $CO_2$ Reduction | | | 2012 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Type | Size | Size units | Median AER/cgDIST | Trajectory value | Trajectory value | Trajectory value | Trajectory value |
| Bulk carrier | 0-9999 | dwt | 25,8 | 21,7 | 21,2 | 20,7 | 20,2 |
| Bulk carrier | 10000-34999 | dwt | 8,0 | 6,8 | 6,6 | 6,4 | 6,3 |
| Bulk carrier | 35000-59999 | dwt | 5,7 | 4,8 | 4,7 | 4,6 | 4,5 |
| Bulk carrier | 60000-99999 | dwt | 4,4 | 3,7 | 3,6 | 3,5 | 3,4 |
| Bulk carrier | 100000-199999 | dwt | 3,0 | 2,5 | 2,5 | 2,4 | 2,4 |
| Bulk carrier | 200000-+ | dwt | 2,6 | 2,2 | 2,1 | 2,1 | 2,0 |
| Chemical tanker | 0-4999 | dwt | 54,1 | 45,5 | 44,5 | 43,4 | 42,3 |
| Chemical tanker | 5000-9999 | dwt | 28,2 | 23,7 | 23,2 | 22,6 | 22,1 |
| Chemical tanker | 10000-19999 | dwt | 18,1 | 15,2 | 14,9 | 14,5 | 14,1 |
| Chemical tanker | 20000-39999 | dwt | 11,6 | 9,8 | 9,5 | 9,3 | 9,1 |
| Chemical tanker | 40000-+ | dwt | 8,4 | 7,1 | 6,9 | 6,7 | 6,6 |
| Container | 0-999 | teu | 24,4 | 20,5 | 20,0 | 19,5 | 19,0 |
| Container | 1000-1999 | teu | 17,9 | 15,1 | 14,7 | 14,4 | 14,0 |
| Container | 2000-2999 | teu | 12,1 | 10,2 | 10,0 | 9,7 | 9,5 |
| Container | 3000-4999 | teu | 11,4 | 9,6 | 9,4 | 9,1 | 8,9 |
| Container | 5000-7999 | teu | 10,4 | 8,7 | 8,5 | 8,3 | 8,1 |
| Container | 8000-11999 | teu | 8,5 | 7,2 | 7,0 | 6,8 | 6,7 |
| Container | 12000-14499 | teu | 6,7 | 5,6 | 5,5 | 5,4 | 5,2 |
| Container | 14500-19999 | teu | 4,4 | 3,7 | 3,6 | 3,5 | 3,5 |
| Container | 20000-+ | teu | 4,4 | 3,7 | 3,6 | 3,5 | 3,5 |
| Cruise | 2000-9999 | gt | 39,0 | 32,4 | 31,6 | 30,8 | 30,0 |
| Cruise | 10000-59999 | gt | 17,1 | 14,3 | 13,9 | 13,5 | 13,2 |
| Cruise | 60000-99999 | gt | 15,4 | 12,8 | 12,5 | 12,1 | 11,8 |
| Cruise | 100000-149999 | gt | 11,9 | 9,9 | 9,7 | 9,4 | 9,2 |
| Cruise | 150000-+ | gt | 9,0 | 7,5 | 7,3 | 7,1 | 6,9 |
| Ferry-RoPax | 5000-9999 | gt | 49,4 | 41,1 | 40,1 | 39,1 | 38,0 |
| Ferry-RoPax | 10000-19999 | gt | 32,1 | 26,8 | 26,1 | 25,4 | 24,7 |
| Ferry-RoPax | 20000-+ | gt | 22,3 | 18,6 | 18,1 | 17,7 | 17,2 |
| Ferry-pax only | 2000-+ | gt | 26,9 | 23,0 | 22,5 | 22,0 | 21,5 |
| General cargo | 0-4999 | dwt | 24,6 | 20,7 | 20,2 | 19,7 | 19,2 |
| General cargo | 5000-9999 | dwt | 19,4 | 16,3 | 15,9 | 15,5 | 15,1 |
| General cargo | 10000-19999 | dwt | 17,0 | 14,3 | 14,0 | 13,6 | 13,3 |
| General cargo | 20000-+ | dwt | 9,5 | 8,0 | 7,8 | 7,6 | 7,4 |
| Liquefied gas tanker | 0-49999 | cbm | 22,3 | 18,8 | 18,3 | 17,9 | 17,4 |
| Liquefied gas tanker | 50000-99999 | cbm | 9,9 | 8,3 | 8,1 | 7,9 | 7,7 |
| Liquefied gas tanker | 100000-199999 | cbm | 11,7 | 9,9 | 9,6 | 9,4 | 9,2 |
| Liquefied gas tanker | 200000-+ | cbm | 10,9 | 9,1 | 8,9 | 8,7 | 8,5 |
| Oil tanker | 0-4999 | dwt | 69,1 | 58,1 | 56,7 | 55,4 | 54,0 |
| Oil tanker | 5000-9999 | dwt | 33,8 | 28,5 | 27,8 | 27,1 | 26,5 |
| Oil tanker | 10000-19999 | dwt | 25,3 | 21,2 | 20,7 | 20,2 | 19,7 |
| Oil tanker | 20000-59999 | dwt | 10,4 | 8,8 | 8,5 | 8,3 | 8,1 |
| Oil tanker | 60000-79999 | dwt | 7,0 | 5,9 | 5,8 | 5,6 | 5,5 |
| Oil tanker | 80000-119999 | dwt | 5,1 | 4,3 | 4,2 | 4,1 | 4,0 |
| Oil tanker | 120000-199999 | dwt | 4,2 | 3,5 | 3,4 | 3,3 | 3,2 |
| Oil tanker | 200000-+ | dwt | 2,7 | 2,3 | 2,3 | 2,2 | 2,1 |
| Other liquids tankers | 0-999 | dwt | 1499,1 | 1261,1 | 1231,3 | 1201,6 | 1171,8 |
| Other liquids tankers | 1000-+ | dwt | 60,1 | 50,6 | 49,4 | 48,2 | 47,0 |
| Refrigerated bulk | 0-1999 | dwt | 152,7 | 128,5 | 125,4 | 122,4 | 119,4 |
| Refrigerated bulk | 2000-5999 | dwt | 70,2 | 59,0 | 57,6 | 56,2 | 54,8 |
| Refrigerated bulk | 6000-9999 | dwt | 45,0 | 37,8 | 36,9 | 36,0 | 35,2 |
| Refrigerated bulk | 10000-+ | dwt | 36,8 | 31,0 | 30,2 | 29,5 | 28,8 |
| Ro-Ro | 0-4999 | dwt | 62,6 | 52,6 | 51,4 | 50,1 | 48,9 |
| Ro-Ro | 5000-9999 | dwt | 48,7 | 40,9 | 40,0 | 39,0 | 38,0 |
| Ro-Ro | 10000-14999 | dwt | 38,5 | 32,4 | 31,6 | 30,9 | 30,1 |
| Ro-Ro | 15000-+ | dwt | 21,8 | 18,3 | 17,9 | 17,5 | 17,1 |
| Vehicle | 0-29999 | gt | 20,2 | 17,1 | 16,7 | 16,3 | 15,9 |
| Vehicle | 30000-49999 | gt | 6,9 | 5,8 | 5,7 | 5,6 | 5,4 |
| Vehicle | 50000-+ | gt | 5,9 | 5,0 | 4,8 | 4,7 | 4,6 |

**Table 8.**

50% Reduction values for 2020–2023. For Cruise, Ferry-Ro-Pax, Ferry-pax only and Vehicle, the denominator of carbon intensity is GT*nm where GT is gross tonnage instead of DWT*nm

Appendix 5

# 100% $CO_2$ reduction trajectories

## Global 100% $CO_2$ reduction trajectory

The global 100% $CO_2$ reduction decarbonization trajectory (the "100% Reduction Trajectory") use the same methodology used to construct the global 50% $CO_2$ reduction decarbonization trajectory (the "50% Reduction Trajectory") in the Poseidon Principles. The overall (all ship type and size categories included as international shipping) improvement required in carbon intensity is calculated from:

1. A projection of the foreseeable growth in transport work across all ship types between the baseline (2012) and the target year (2050)
2. The target $CO_2$ emissions in 2050

The estimate of the target $CO_2$ emissions in 2050 in the 50% Reduction Trajectory is taken by applying the IMO's Initial Strategy Objective 3 minimum target (at least a 50% reduction), to the IMO Initial Strategy's baseline year (2008) total $CO_2$ emissions (921Mt), taken from the Third IMO GHG Study. As discussed in Appendix 4, this currently represents the minimum level of ambition and therefore the maximum absolute emissions and least ambitious aggregate carbon intensity.

To construct the 100% Reduction Trajectory, the target $CO_2$ emissions in 2050 is taken by applying the IMO's Initial Strategy Objective 3 maximum reduction target (100% reduction), to the IMO Initial Strategy's baseline year (2008) total $CO_2$ emissions.

Values for the total transport demand, total $CO_2$ emissions, and aggregate carbon intensity in 2008, 2012 and 2050 are given in Table 8 [17].

| | 2008 | 2012 | 2050 |
|---|---|---|---|
| Total transport demand (billion tonne miles) | 46 003 | 54 077 | 119 429 |
| Total CO2 emissions (million tonnes) | 921 | 848 | 0 |
| Estimated aggregate carbon intensity (gCO2/tnm) | 20.0 | 15.7 | 0.0 |

**Table 9.**
Transport demand, carbon emissions and carbon intensity for international shipping

17 The values are the same as those from the Poseidon Principles trajectories except the 2050 values for carbon emissions and carbon intensity which are both zero.

Figure 19 plots the carbon intensity values in Table 8 and a linear trend line connecting them compared to the global carbon intensity values used in the 50% Reduction Trajectory (Table 8). In order for these trajectories to be easily compared to each other, the shape of the curve and emissions scope (operational carbon emissions) was chosen to be consistent with the Poseidon Principles methodology.

Like the 50% Reduction Trajectory, the chosen 100% Reduction Trajectory represents a gradual and consistent rate of improvement on average across the fleet; the assumption is for a constant improvement year-on-year, which is described by a straight line between 2012 and 2050.

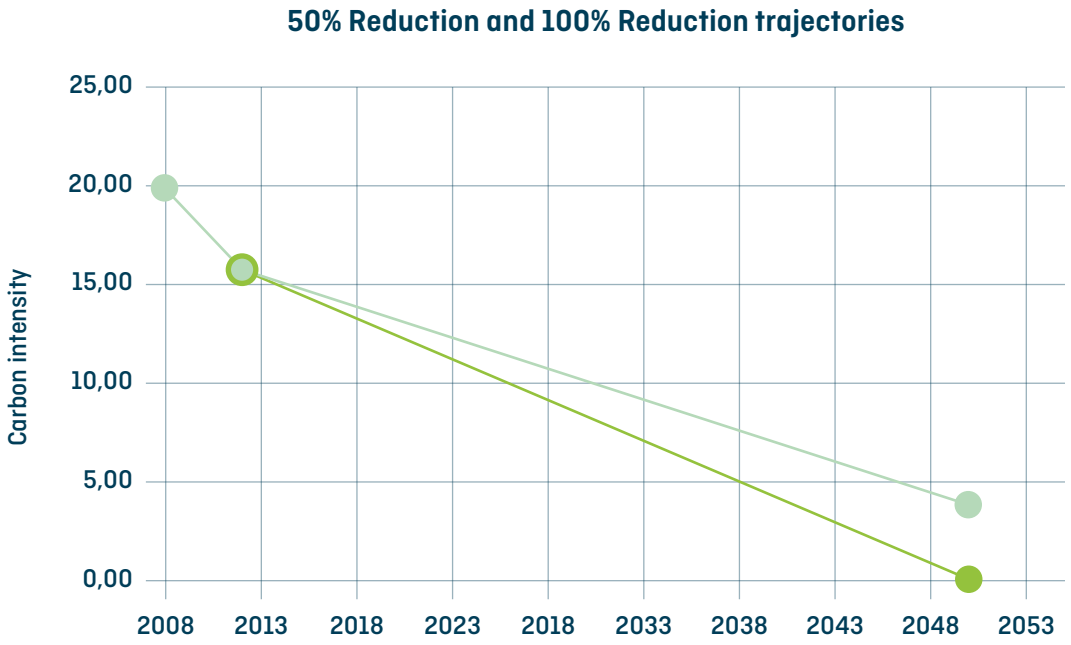


**Figure 19.**
50% Reduction and 100% Reduction trajectories

## Calculating the target carbon intensity, corrected to AER, in a given year as a function of the ship type and size class

The rate of reduction required per year is relative to the last historical data point (2012). The trajectory is shown relative to 2012 global carbon intensity (indexed to 2012 carbon intensity) in Figure 20.

While the trajectory is presented for the time period 2012 to 2050, it is consistent with the 2008 baseline year as specified in the IMO Initial Strategy Objectives as the end point is determined by a 100% reduction in absolute emissions relative to the baseline. The formula for the trajectory is given in Figure 20 is for illustrative purposes. The index value represents the required carbon intensity value relative to the carbon intensity in 2012.

The carbon intensity metric currently chosen for the Poseidon Principles is AER for cargo-carrying ships which use deadweight to measure their capacity and cgDIST[19] for ships measured in gross tonnage. The latter category includes Cruise, Ferry-RoPax, Ferry-pax only and Vehicle.

The trajectory values are calculated using the same methodology as the Poseidon Principles trajectories (Appendix 4).

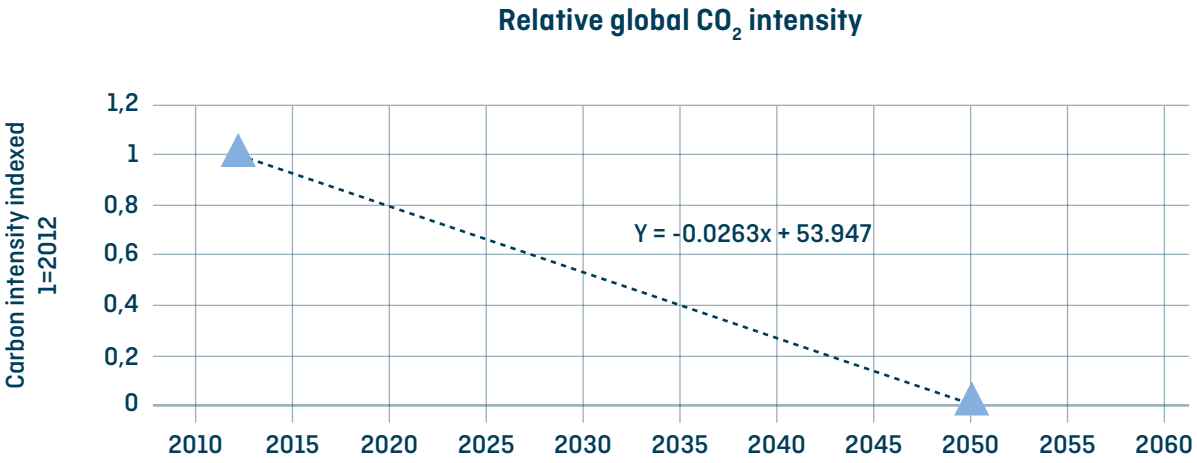


**Figure 20.**[18]
Indexed decarbonisation trajectory, 2012-2050

18 The slope and intercept are rounded, calculated using precise index values for 2012 and 2050. Trajectory values derived using the equation in Figure 2 will not match values in Table 2 exactly due to rounding error.

19 cgDIST is $CO_2$/GT*nm, the same formula as AER, except deadweight is replaced with gross tonnage in the denominator of Equation 1.

| 100% $CO_2$ Reduction | | | 2012 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| **Type** | **Size** | **Size units** | **Median AER/cgDIST** | **Trajectory value** | **Trajectory value** | **Trajectory value** | **Trajectory value** |
| Bulk carrier | 0-9999 | dwt | 25,8 | 19,7 | 19,0 | 18,3 | 17,7 |
| Bulk carrier | 10000-34999 | dwt | 8,0 | 6,1 | 5,9 | 5,7 | 5,5 |
| Bulk carrier | 35000-59999 | dwt | 5,7 | 4,4 | 4,2 | 4,1 | 3,9 |
| Bulk carrier | 60000-99999 | dwt | 4,4 | 3,3 | 3,2 | 3,1 | 3,0 |
| Bulk carrier | 100000-199999 | dwt | 3,0 | 2,3 | 2,2 | 2,1 | 2,1 |
| Bulk carrier | 200000-+ | dwt | 2,6 | 2,0 | 1,9 | 1,8 | 1,8 |
| Chemical tanker | 0-4999 | dwt | 54,1 | 41,3 | 39,9 | 38,5 | 37,0 |
| Chemical tanker | 5000-9999 | dwt | 28,2 | 21,5 | 20,8 | 20,0 | 19,3 |
| Chemical tanker | 10000-19999 | dwt | 18,1 | 13,8 | 13,3 | 12,8 | 12,4 |
| Chemical tanker | 20000-39999 | dwt | 11,6 | 8,9 | 8,6 | 8,3 | 8,0 |
| Chemical tanker | 40000-+ | dwt | 8,4 | 6,4 | 6,2 | 6,0 | 5,7 |
| Container | 0-999 | teu | 24,4 | 18,6 | 18,0 | 17,3 | 16,7 |
| Container | 1000-1999 | teu | 17,9 | 13,7 | 13,2 | 12,7 | 12,3 |
| Container | 2000-2999 | teu | 12,1 | 9,3 | 8,9 | 8,6 | 8,3 |
| Container | 3000-4999 | teu | 11,4 | 8,7 | 8,4 | 8,1 | 7,8 |
| Container | 5000-7999 | teu | 10,4 | 7,9 | 7,6 | 7,4 | 7,1 |
| Container | 8000-11999 | teu | 8,5 | 6,5 | 6,3 | 6,1 | 5,8 |
| Container | 12000-14499 | teu | 6,7 | 5,1 | 4,9 | 4,8 | 4,6 |
| Container | 14500-19999 | teu | 4,4 | 3,4 | 3,3 | 3,1 | 3,0 |
| Container | 20000-+ | teu | 4,4 | 3,4 | 3,3 | 3,1 | 3,0 |
| Cruise | 2000-9999 | gt | 39,0 | 29,8 | 28,8 | 27,7 | 26,7 |
| Cruise | 10000-59999 | gt | 17,1 | 13,1 | 12,6 | 12,2 | 11,7 |
| Cruise | 60000-99999 | gt | 15,4 | 11,7 | 11,3 | 10,9 | 10,5 |
| Cruise | 100000-149999 | gt | 11,9 | 9,1 | 8,8 | 8,5 | 8,2 |
| Cruise | 150000-+ | gt | 9,0 | 6,9 | 6,6 | 6,4 | 6,1 |
| Ferry-RoPax | 5000-9999 | gt | 49,4 | 37,7 | 36,4 | 35,1 | 33,8 |
| Ferry-RoPax | 10000-19999 | gt | 32,1 | 24,5 | 23,7 | 22,8 | 22,0 |
| Ferry-RoPax | 20000-+ | gt | 22,3 | 17,0 | 16,5 | 15,9 | 15,3 |
| Ferry-pax only | 2000-+ | gt | 26,9 | 20,6 | 19,9 | 19,1 | 18,4 |
| General cargo | 0-4999 | dwt | 24,6 | 18,8 | 18,1 | 17,5 | 16,8 |
| General cargo | 5000-9999 | dwt | 19,4 | 14,8 | 14,3 | 13,8 | 13,2 |
| General cargo | 10000-19999 | dwt | 17,0 | 13,0 | 12,5 | 12,1 | 11,6 |
| General cargo | 20000-+ | dwt | 9,5 | 7,2 | 7,0 | 6,7 | 6,5 |
| Liquefied gas tanker | 0-49999 | cbm | 22,3 | 17,0 | 16,4 | 15,9 | 15,3 |
| Liquefied gas tanker | 50000-99999 | cbm | 9,9 | 7,5 | 7,3 | 7,0 | 6,8 |
| Liquefied gas tanker | 100000-199999 | cbm | 11,7 | 8,9 | 8,6 | 8,3 | 8,0 |
| Liquefied gas tanker | 200000-+ | cbm | 10,9 | 8,3 | 8,0 | 7,7 | 7,4 |
| Oil tanker | 0-4999 | dwt | 69,1 | 52,7 | 50,9 | 49,1 | 47,3 |
| Oil tanker | 5000-9999 | dwt | 33,8 | 25,8 | 24,9 | 24,0 | 23,2 |
| Oil tanker | 10000-19999 | dwt | 25,3 | 19,3 | 18,6 | 17,9 | 17,3 |
| Oil tanker | 20000-59999 | dwt | 10,4 | 7,9 | 7,7 | 7,4 | 7,1 |
| Oil tanker | 60000-79999 | dwt | 7,0 | 5,4 | 5,2 | 5,0 | 4,8 |
| Oil tanker | 80000-119999 | dwt | 5,1 | 3,9 | 3,7 | 3,6 | 3,5 |
| Oil tanker | 120000-199999 | dwt | 4,2 | 3,2 | 3,1 | 3,0 | 2,8 |
| Oil tanker | 200000-+ | dwt | 2,7 | 2,1 | 2,0 | 1.9 | 1,9 |
| Other liquids tankers | 0-999 | dwt | 1499,1 | 11440,0 | 1104,6 | 1065,1 | 1025,7 |
| Other liquids tankers | 1000-+ | dwt | 60,1 | 45,9 | 44,3 | 42,7 | 41,1 |
| Refrigerated bulk | 0-1999 | dwt | 152,7 | 116,5 | 112,5 | 108,5 | 104,5 |
| Refrigerated bulk | 2000-5999 | dwt | 70,2 | 53,5 | 51,7 | 49,9 | 48,0 |
| Refrigerated bulk | 6000-9999 | dwt | 45,0 | 34,3 | 33,1 | 32,0 | 30,8 |
| Refrigerated bulk | 10000-+ | dwt | 36,8 | 28,1 | 27,1 | 26,2 | 25,2 |
| Ro-Ro | 0-4999 | dwt | 62,6 | 47,7 | 46,1 | 44,4 | 42,8 |
| Ro-Ro | 5000-9999 | dwt | 48,7 | 37,1 | 35,9 | 34,6 | 33,3 |
| Ro-Ro | 10000-14999 | dwt | 38,5 | 29,4 | 28,4 | 27,4 | 26,3 |
| Ro-Ro | 15000-+ | dwt | 21,8 | 16,6 | 16,1 | 15,5 | 14,9 |
| Vehicle | 0-29999 | gt | 20,2 | 15,4 | 14,9 | 14,4 | 13,9 |
| Vehicle | 30000-49999 | gt | 6,9 | 5,3 | 5,1 | 4,9 | 4,7 |
| Vehicle | 50000-+ | gt | 5,9 | 4,5 | 4,3 | 4,2 | 4,0 |

**Table 10.**

100% Reduction trajectory values for 2020–2023. For Cruise, Ferry-RoPax, Ferry-pax only and Vehicle, the denominator of carbon intensity is GT*nm where GT is gross tonnage instead of DWT*nm

# Acknowledgements

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## Drafting Group

**Patrizia Kern**, Head Marine, Swiss Re Corporate Solutions
**Roberto Spanu**, Senior Marine Risk Engineer, Swiss Re Corporate Solutions
**Rolf Thore Roppestad**, Chief Executive Officer, Gard
**Live Jacob Sydness**, Vice President of Sustainable Business, Gard
**Sigvald Fossum**, Vice President, Head of Analytics, Gard
**Helle Hammer**, Managing Director, Cefor
**Ben Abraham**, CEO Global Marine, Willis Towers Watson
**Christos G. Anagnostou**, Marine Operations Director, Star Bulk
**Lars Henneberg**, Vice President, Head of Risk Management, AP Møller-Mærsk
**Chris Hughes**, Global Lead Shipping Markets, Lloyd's Register

## Project team

**Johannah Christensen**, Chief Executive Officer, Global Maritime Forum
**Elyse Lawson**, Project Manager, Global Maritime Forum
**Heidi Kilemo**, Project Associate, Global Maritime Forum
**Anna Jilkova**, Project Associate, Global Maritime Forum
**Elena Pesce**, Business Analyst, Swiss Re Institute
**Vicci Xi Fan**, Commercialization Business Analyst, Swiss Re Institute
**Tristan Smith**, Reader in Energy and Shipping, University College London Energy Institute
**Sophie Parker**, Principal Consultant, UMAS

## Additional Support

**Andrea Cupido**, Head Global Hull, Swiss Re Corporate Solutions
**Alicia Montoya**, Head Research Commercialization, Swiss Re Institute
**Butch Bucani**, Programme Leader, UN Environment Programme's Principles for Sustainable Insurance Initiative
**Antonis Lagadianos**, Partner, Watson Farley & Williams
**Jean-Marc Bonello**, Consultant, UMAS
**Morten Berggreen**, Managing Counsel, Gorrissen Federspiel
**Bethanie John**, Legal Consultant, Gorrissen Federspiel
**Poseidon Principles Association and the Sea Cargo Charter Association**
**IUMI**

## Drafting Group











**Poseidon Principles**
Amaliegade 33 B, 3rd floor
1256 Copenhagen K
Denmark

www.poseidonprinciples.org
info@poseidonprinciples.org