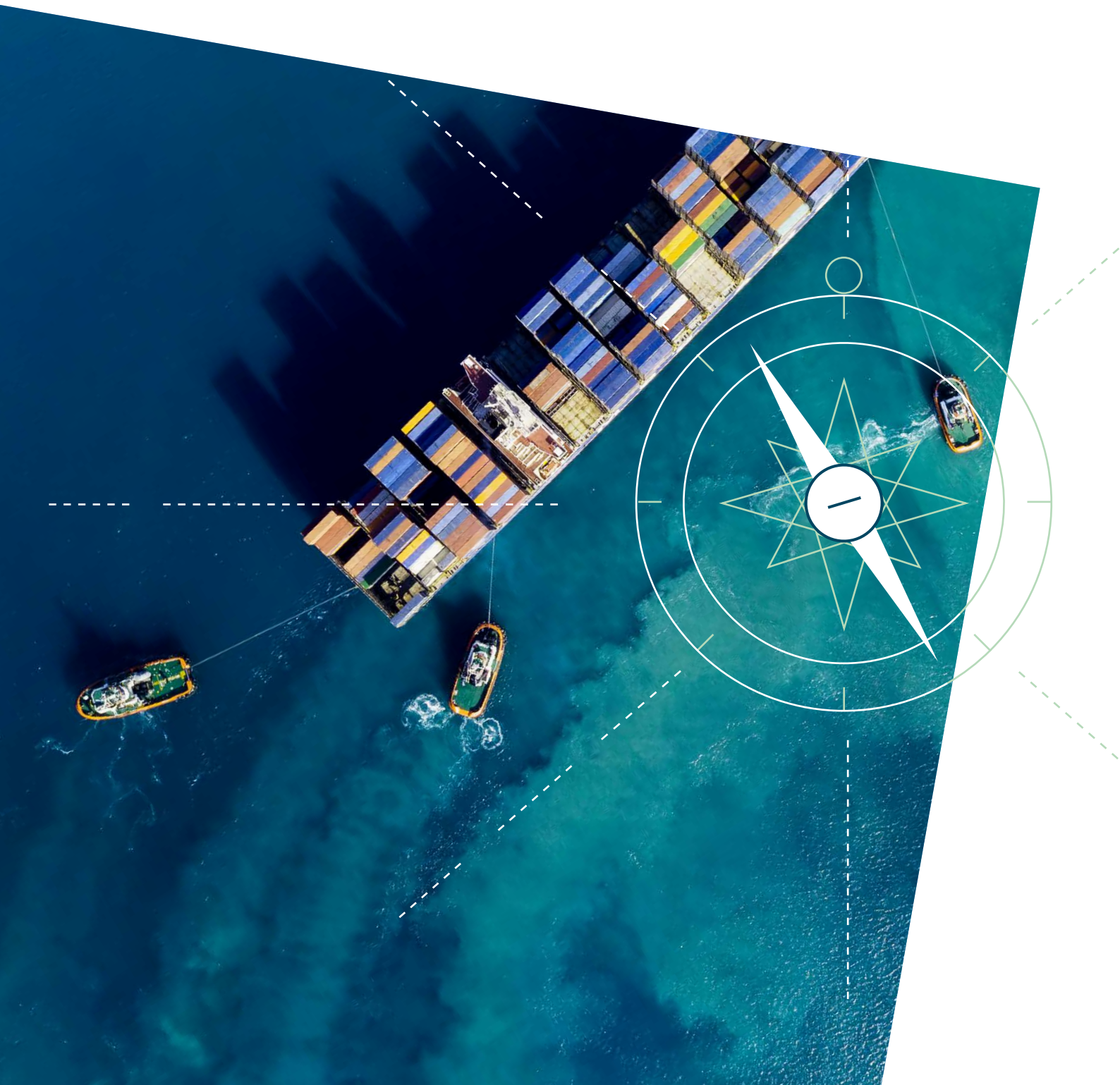
POSEIDON PRINCIPLES

Technical Guidance

A global framework for responsible ship finance



Technical Guidance
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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 these impacts.

As financial institutions, we recognise that our role in the industry affords us opportunities to promote responsible environmental stewardship throughout the maritime value chain. The Poseidon Principles were established to serve as a framework for creating common, global baselines that are consistent with and supportive of climate goals. The Poseidon Principles are ground-breaking in both the spheres of shipping and sustainable finance. They will not only serve our institutions to improve decision-making at a strategic level and enable us to better align our portfolios with responsible environmental impacts, but will also shape a better future for the shipping industry and our society.

The Poseidon Principles are consistent with the policies and ambitions of the IMO, including its 2023 Revised Strategy on Reduction of GHG Emissions from Ships (2023 IMO GHG Strategy), which calls for the emissions from international shipping to drop to net-zero around 2050 compared to 2008 levels with interim targets in 2030 and 2040 on a well-to-wake basis. They are also intended to support other initiatives, such as the Principles for Responsible Banking, Carbon Disclosure Project, Energy Transitions Commission, Task Force on Climate-Related Financial Disclosures and the many others that are developing to address adverse factors.

As signatories, we commit to implementing the Poseidon Principles in our internal policies, procedures, and standards, and to work in partnership with our clients and partners on an ongoing basis to implement the Poseidon Principles. We welcome the establishment of global baselines through the Poseidon Principles and acknowledge that some signatories may choose to go beyond them. This offers significant benefits to us as signatories, to the global maritime industry, and to society as a whole.

We understand that the Poseidon Principles are intended to evolve over time and agree to contribute to a review process to ensure that the Poseidon Principles are practical and effective and support the development of the global shipping industry. We are proud to continue our commitment to improving the role of maritime finance in addressing global environmental issues.

What began with 11 signatories in 2019 is now over 30 strong with increased membership anticipated, a testament to the growing impact of our collective commitment and the importance of transparency in propelling the maritime industry towards decarbonisation. We invite you to join us.

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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 are a framework for assessing the climate alignment of ship finance portfolios. They are supported by a robust and industry-appropriate climate alignment methodology and carefully considered accountability and enforcement requirements that support practical and robust data collection and analysis practices. The Poseidon Principles also establish transparency requirements for signatories.

These requirements of each Principle are explained in the sections that follow. The general timeline signatories follow to meet the requirements is explained in Figure 1.

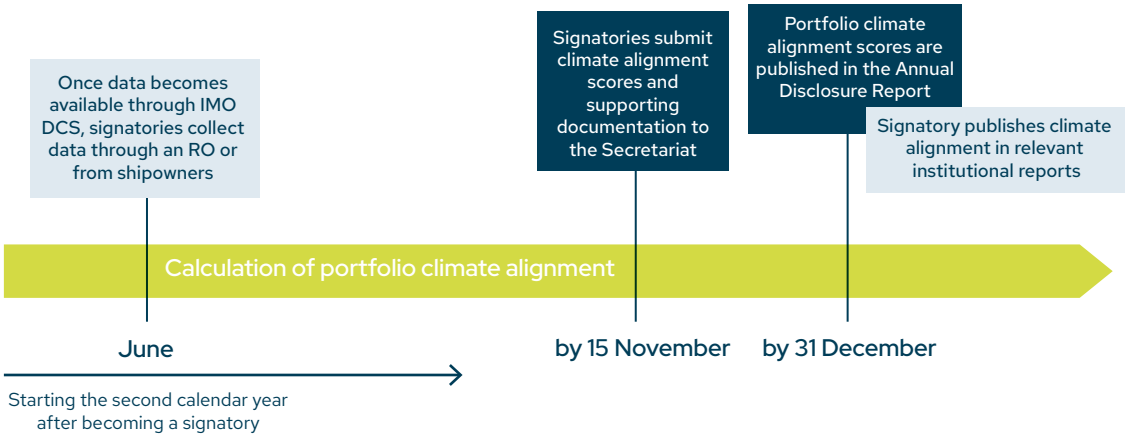


Figure 1.
Timeline for signatories of the Poseidon Principles

The Poseidon Principles are consistent with the policies and ambitions of shipping's governing body, the International Maritime Organisation (IMO). This includes the 2023 IMO Strategy on Reduction of GHG Emissions from Ships (2023 IMO GHG Strategy), adopted in July 2023, which calls for emissions from international shipping to drop to net-zero around 2050 compared to 2008 levels on a well-to-wake basis. Figure 2 below illustrates how well-to-wake emissions are a combination of tank-to-wake (operational) and well-to-tank (upstream) emissions, accounting for the full life cycle of emissions.

The 2023 IMO GHG Strategy also includes interim emission reduction targets in 2030 and 2040. Furthermore, the emissions boundary now consists of the impact of non-carbon dioxide (CO_2) greenhouse gas (GHG) species, namely methane (CH_4) and nitrous oxide (N_2O). This represents a significant shift in climate ambition for a sector that accounts for 2% to 3% of global GHG emissions.[1]

It is recognised that some signatories may choose to both fulfill their obligations under the Poseidon Principles as well as go beyond those obligations. Some signatories may choose to do this through assessing their portfolios relative to the Paris Agreement's well-below 2°C objectives, which require a steeper decarbonisation trajectory. It is recommended that, where possible, these additional efforts rely on the assessment, accountability, enforcement, and transparency practices established by the Poseidon Principles to ensure that these further efforts are robust in their demonstration of industry leadership.

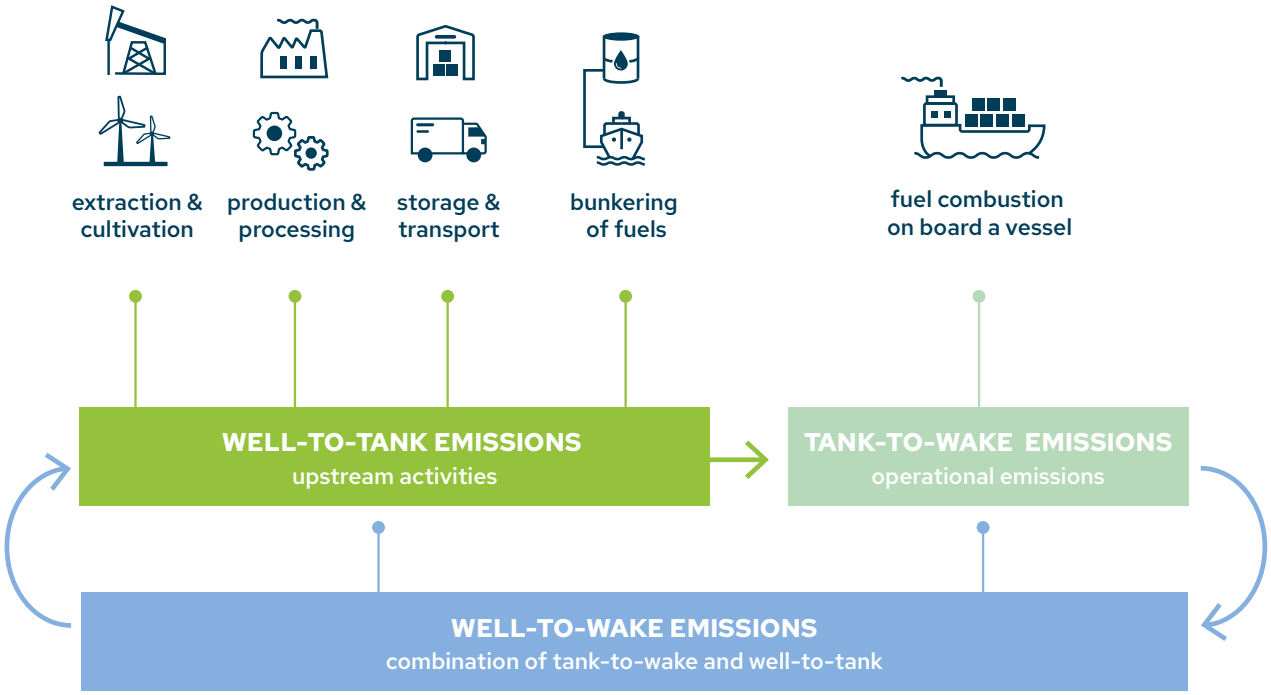


Figure 2.
Visual representation of the differences between tank-to-wake, well-to-tank, and well-to-wake emissions

1 Faber, J., Hanayama, S., Zhang, S., Pereda, P., Comer, B., Hauerhof, E., Schim van der Loeff, W., Smith, T., Zhang, Y., Kosaka, H., Adachi, M., Bonello, J. M., Galbraith, C., Gong, Z., Hirata, K., Hummels, D., Kleijn, A., Lee, D. S., Liu, Y., ... Xing, H. (2020). Fourth Greenhouse Gas Study 2020. International Maritime Organization.

1.1 The Principles

Principle 1

Assessment

"We will annually assess climate alignment in line with the Technical Guidance for all business activities."

Our commitment:

Signatories will measure the emissions intensity of their shipping portfolios on an annual basis and assess their climate alignment relative to established decarbonisation trajectories. This assessment is based on a robust industry-appropriate methodology outlined in the Technical Guidance. The requirement to assess climate alignment takes effect the calendar year after a financial institution becomes a signatory.

Principle 2

Accountability

"We recognise the important role that classification societies and other IMO recognised organisations[2] play in providing unbiased information to the industry and the mandatory regulation established by the IMO for the data collection and reporting of fuel consumption from ships to the IMO DCS. We will rely on such entities and mandatory regulations as explicitly identified in the Technical Guidance for the provision of information used to assess and report climate alignment."

Our commitment:

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

Principle 3

Enforcement

"We will require that ongoing compliance with the Poseidon Principles is made contractual in our new business activities using standardised covenant clauses. We will contribute to the update and addition of standardised clauses through the annual review process."

Our commitment:

Signatories will agree to work with clients and partners to gather the necessary information to calculate emissions intensity and assess climate alignment.

2 A recognised organisation (RO) is an authorised organisation that performs statutory requirements on behalf of the flag state of a vessel. While normally a Classification Society, in case of the IMO DCS, independent verifiers have been authorised by some flag states.

Principle 4

Transparency

"We will publicly acknowledge that we are a signatory of the Poseidon Principles and we will publish the results of the portfolio climate alignment score of our business activities on an annual basis in line with the Technical Guidance."

Our commitment:

1. Upon becoming a signatory, the financial institution will publicly acknowledge that it is a signatory of the Poseidon Principles.
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 15 November. This requirement takes effect for each signatory in the calendar year after the calendar 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.

1.2 Scope

The Poseidon Principles are applicable to relevant lenders, lessors, and financial guarantors, including export credit agencies (ECA). Signatories must apply the Poseidon Principles to all business activities:

1. that are credit products (including bilateral loans, syndicated loans, club deals, and guarantees) secured by vessel mortgages or finance leases secured by title over vessel, or unmortgaged ECA loans tied to a vessel; and
2. where a vessel or vessels fall under the purview of the International Maritime Organization (IMO) e.g. vessels with a gross tonnage of 5,000 and above that trade internationally and have an established Poseidon Principles trajectory whereby the emissions intensity can be measured with IMO Data Collection System (DCS) data.

The scope of financial products will be reviewed and may be expanded by signatories on a timeline that is at their discretion.

Climate alignment is currently the only environmental factor considered by the Poseidon Principles. This scope will be reviewed and may be expanded by signatories on a timeline that is at their discretion.

2

Assessment

PRINCIPLE

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

REQUIREMENTS

Signatories will measure the emissions intensity of their shipping portfolios on an annual basis and assess their climate alignment relative to established decarbonisation trajectories. This assessment is based on a robust industry-appropriate methodology outlined in the Technical Guidance. The requirement to assess climate alignment takes effect the calendar year after a financial institution becomes a signatory.

This section provides step-by-step guidance for measuring the climate alignment of financial institutions' shipping portfolios. The guidance is framed in the context of the existing IMO environmental regulations and climate agreements. It is informed by recommendations made by the Carbon Disclosure Project and the Task Force on Climate-related Financial Disclosures (TCFD).

The 2023 IMO GHG Strategy sets out the following absolute reduction levels of ambition:

1. To reduce the total annual GHG emissions from international shipping by at least 20%, striving for 30%, by 2030, compared to 2008.
2. To reduce the total annual GHG emissions from international shipping by at least 70%, striving for 80%, by 2040, compared to 2008.
3. GHG emissions from international shipping to peak as soon as possible and to reach net-zero GHG emissions by or around, i.e. close to 2050.
4. Carbon intensity of international shipping to decline to reduce CO_2 emissions per transport work, as an average across international shipping, by at least 40% by 2030, compared to 2008.

Additionally, the 2023 IMO GHG Strategy specifies that any activity related to emission reduction and climate alignment in shipping will need to consider well-to-wake emissions as well as all the relevant GHG species as specified by the IMO:

"The levels of ambition and indicative checkpoints should take into account the well-to-wake GHG emissions of marine fuels as addressed in the Guidelines on life cycle emissions intensity of marine fuels (LCA Guidelines)[3] developed by the Organization with the overall objective of reducing GHG emissions within the boundaries of the energy system of international shipping and preventing a shift of emissions to other sectors."

3 The Committee adopted Resolution MEPC.376(80) containing the Marine Fuel Life Cycle GHG Guidelines (LCA Guidelines) and agreed on a work program for further enhancement of the guidelines on specific areas via the existing correspondence group.

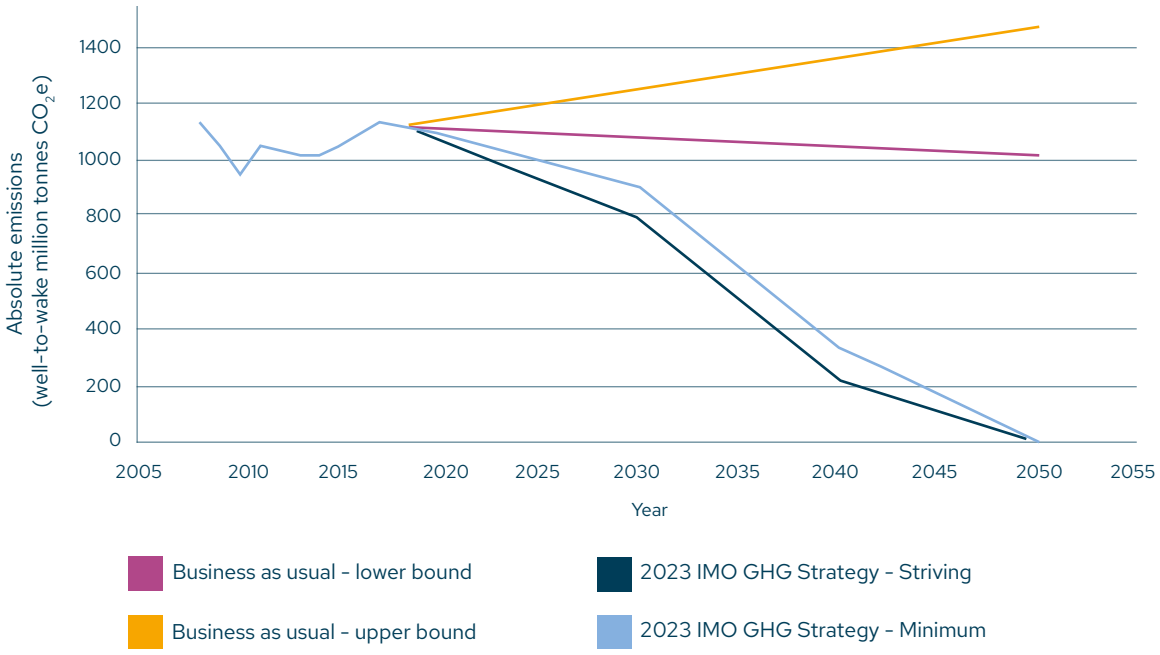


Figure 3.
Global fleet's CO_2e targets and trajectories defined by the 2023 IMO GHG Strategy

The IMO absolute targets can be converted into an emission intensity target. Figure 4 shows intensity trajectories consistent with the 2023 IMO GHG Strategy compared to the pathway drawn using the IMO legacy intensity target.

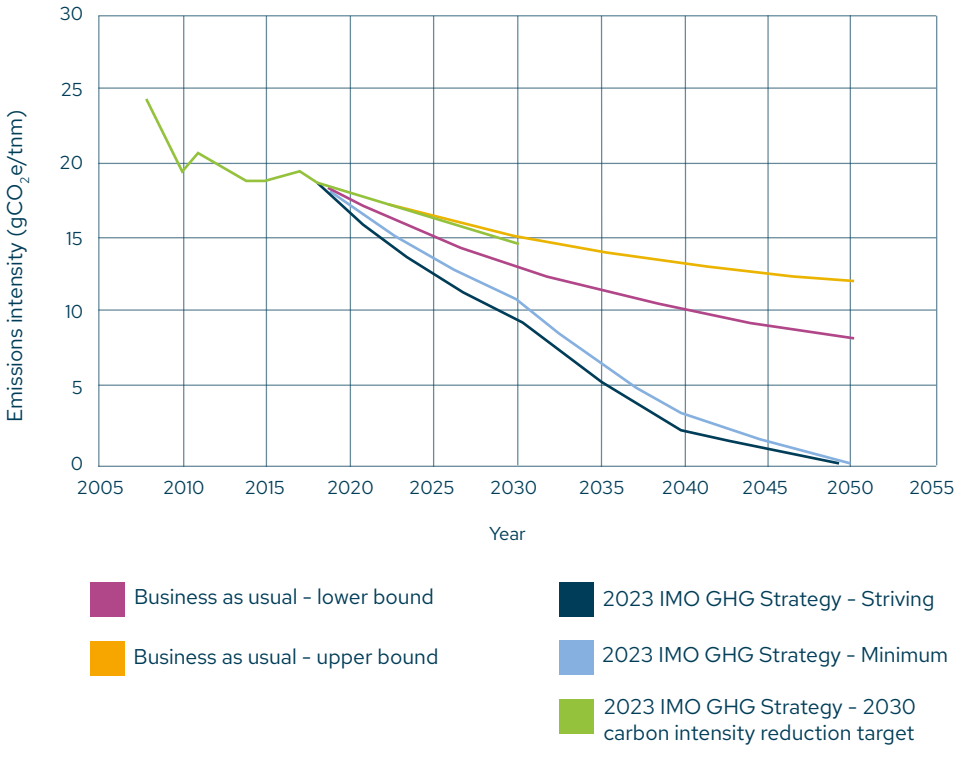


Figure 4.
Global fleet's emission intensity targets and trajectories defined by the 2023 IMO GHG Strategy

The IMO intensity target is misaligned with the absolute reduction targets being significantly less ambitious as it was not updated to match the absolute target and the wording of the 2023 IMO GHG Strategy does not state that meeting the intensity target ensures compliance with the IMO absolute target. For these reasons, the Poseidon Principles will be linked to the IMO absolute target.

The Poseidon Principles fully supports the increased level of ambition set up by the new IMO GHG Strategy and therefore includes global decarbonisation trajectories that are aligned with the outcome of the 80th Marine Environment Protection Committee (MEPC 80). In order to take into account for this change, the Poseidon Principles comprises of two trajectories for reporting:

- **2023 IMO GHG Strategy - Minimum**: defined by the 'minimum' requirement of the revised strategy with a 20% reduction in 2030, a 70% reduction in 2040 (compared to 2008 emissions) leading to net-zero by 2050.
- **2023 IMO GHG Strategy - Striving**: defined by the higher level of ambition set in the revised strategy with a 30% reduction in 2030, a 80% reduction in 2040 (compared to 2008 emissions) leading to net-zero by 2050.

2.1 Selecting the right metric for measuring climate alignment

Both absolute and intensity-level measurements of GHG emissions are useful for meeting the IMO levels of ambition, and both measurements are recommended by other initiatives like the Carbon Disclosure Project and the Science Based Targets Initiative. 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/decarbonisation 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, a relative intensity-level metric is used in the Poseidon Principles.

Due to the changes in the 2023 IMO GHG Strategy, emissions intensity now represents a full life cycle approach, and includes the total GHG emissions (well-to-wake) to satisfy a supply of transport work (grams of well-to-wake CO_2e per metric tonne-nautical mile [gCO_2e/tnm]). Emissions intensity is typically quantified for multiple voyages over a period of time (e.g., a year). To provide the most accurate representation of a vessel's climate impact, the emissions intensity of a vessel should be measured from its performance in real operating conditions instead of using a design specification metric (e.g., the Energy Efficiency Design Index).

The selection of this single metric is guided by an ambition that the Poseidon Principles use an emissions intensity metric which produces the closest measure of the vessel's true emissions intensity, while ensuring consistency with the policies and regulations of the IMO as well as of the IMO DCS regulation and associated guidelines.

The IMO DCS is an amendment to MARPOL Annex VI which entered into force in March 2018. The IMO DCS specifies the data that the IMO has mandated for shipowners to collect and report per calendar year for 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.[4] The data collected and reported includes the:

1. amount of fuel consumption for each type of fuel in metric tonnes;
2. distance travelled;
3. hours underway; and
4. technical characteristics of the ship including deadweight at maximum summer draught.

Prior to reporting to the IMO, the data must be checked to be in accordance with the regulation by the relevant flag state or an RO. A Statement of Compliance (SoC) will be issued by the relevant flag state or RO no later than 5 months from the beginning of the following calendar year (e.g., for the calendar year 2023, it would be issued by the end of May 2024) 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. As of March 2021, a Verification Letter issued by a RO may be accepted in lieu of a SoC, where such a Verification Letter expressly states the vessel's identification, reporting period relating to the IMO DCS, and is duly signed. The data reported to the IMO is anonymised and confidential, and therefore it cannot be accessed from the IMO by 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 minimised and simplifies the application of the Poseidon Principles.

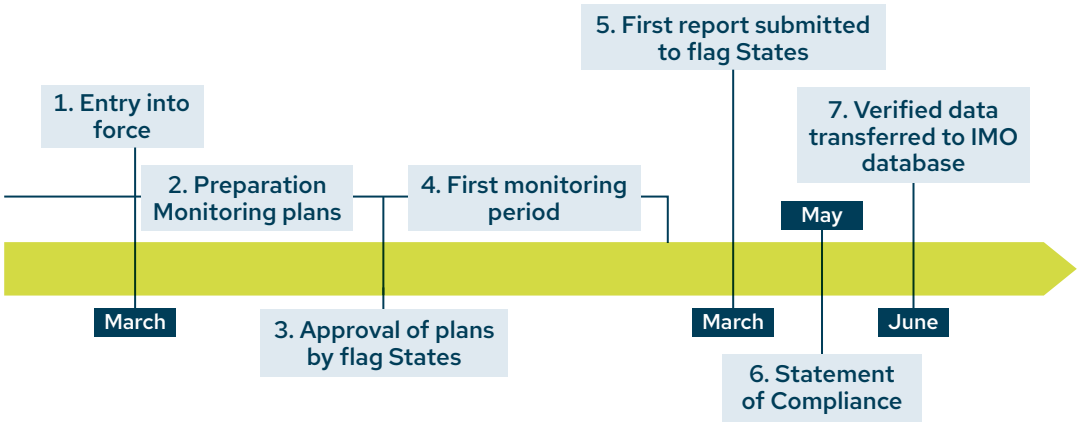


Figure 5.
The IMO DCS implementation schedule

4 IMO MEPC RESOLUTION MEPC.278(70).

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 grams of CO_2 emitted per deadweight tonne per nautical mile (gCO_2/dwt-nm):

$$AER = \frac{\sum_i C_i}{\sum_i dwt D_i}$$

Equation 1

In Equation 1, $\boldsymbol{C_i}$ 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 $\boldsymbol{D_i}$ is the distance travelled on voyage ***i***. The AER is computed for all voyages performed over a calendar year.

This metric is calculated using the total possible annual transport work performed by a ship, obtained from its total distance travelled and DWT (in metric tonne units). In the context of the Poseidon Principles, AER is used as the metric for calculating climate alignment for vessels which use deadweight to measure their capacity. For vessel types that use gross tonnage to measure their capacity, capacity gross tonne distance (cgDIST) is used to calculate actual emissions intensity, as recommended by IMO MEPC RESOLUTION MEPC.352(78). The cgDIST calculation uses the same formula as AER, but uses gross tonnage instead of deadweight and is reported in grams of CO_2 emitted per gross tonnage per nautical mile (gCO_2/gt-nm).

It is recognised that AER is less accurate at estimating a vessel's carbon intensity than some other metrics (e.g., Energy Efficiency Operational Indicator [EEOI]) because the actual cargo carried by a ship is often less than its maximum capacity and many ships (e.g., tankers and bulkers) operate with ballast voyages where for several voyages a year they have no cargo. In addition, currently, data collection 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 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 may be adapted to reflect this.

2.2 Calculating vessel emissions intensity

Following the adoption of the 2023 IMO GHG Strategy, the emissions boundary for reporting against the IMO's level of ambition changed from a tank-to-wake CO_2 to a well-to-wake CO_2e perspective. It is expected that the IMO DCS regulation will be updated to align with the 2023 IMO GHG Strategy in due course to reflect this change in data collection required.

In September 2023, the Poseidon Principles decided to pro-actively change its reporting methodology to include well-to-wake CO_2e emissions by providing a set of emission factors that can be applied to the existing IMO DCS data and AER calculation as below in Equation 2:

$$AER = \frac{\sum_i Ce_i}{\sum_i dwt D_i}$$

Equation 2

In Equation 2, well-to-wake emission factors replace the carbon factors used to calculate C_i in Equation 1. Ce_i is the carbon equivalent emissions for voyage i, meaning the units of measurement for calculations of AER and cgDIST are gCO_2e/dwt-nm and gCO_2e/gt-nm respectively.

References to AER and cgDIST in the Poseidon Principles refer to a well-to-wake carbon equivalent emissions intensity metric rather than a tank-to-wake carbon intensity metric as defined by existing regulation. Complete details, including the well-to-wake emission factors to be used by signatories, can be found in Appendix 3.

Vessel emissions 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 require that all signatories use this method for calculating emissions intensity.

There may be circumstances where it is not possible to gain access to the data as reported under the IMO DCS from shipowners. Section 3.3.4 outlines how this should be addressed.

2.3 Assessing climate alignment

For the purposes of the Poseidon Principles, climate alignment is defined as the degree to which a vessel, product, or portfolio's emissions intensity is in line with a decarbonisation trajectory that meets the 2023 IMO GHG Strategy decarbonisation ambitions. Decarbonisation trajectories are explained in Section 2.4.

Climate alignment at the vessel level (Δ_i) is the difference between a vessel's emissions intensity and the decarbonisation trajectory at the same point in time. Vessel climate alignment is expressed as a positive or negative percentage. In mathematical terms, alignment at time t is:

In Equation 3, x_i is the emissions intensity of vessel i and r_s is the required emissions intensity for the ship type and size for time period t. This value is multiplied by 100 to convert it to a percentage. A positive alignment score means a vessel is misaligned (above the decarbonisation trajectory), whereas a negative or zero score means a vessel is aligned (on or below the decarbonisation trajectory).

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

Equation 3

In Figure 6, each dot represents the annual emissions intensity of a vessel. The blue curve represents the decarbonisation trajectory. The green dots are aligned, and the red dots are misaligned.

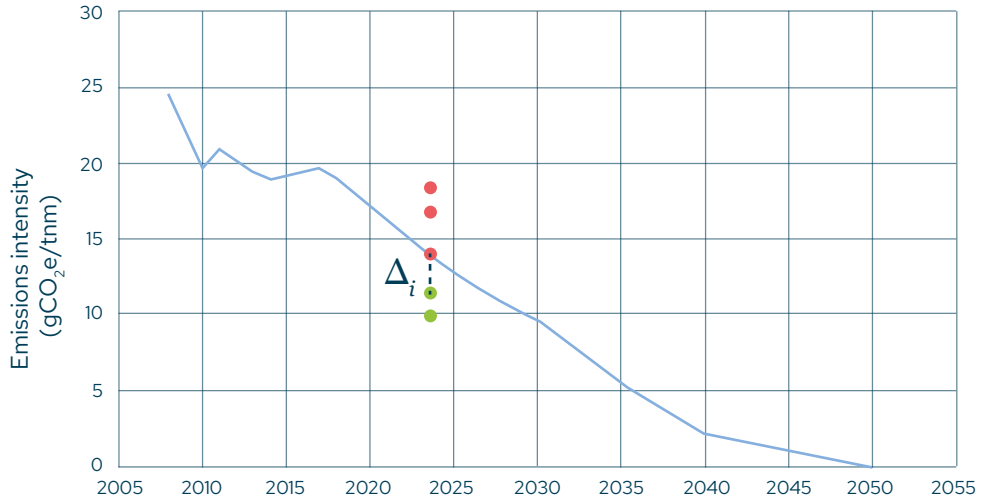


Figure 6.
Assessing alignment at the vessel level

To assess climate alignment at the portfolio level, the vessel emission intensities are aggregated using the methods described in Section 2.5.

2.4 Decarbonisation trajectories

A decarbonisation trajectory is a representation of how many grams of CO_2e a single ship can emit to move one metric tonne of goods one nautical mile on a well-to-wake basis (gCO_2e/tnm) over a time horizon (as shown in Figure 3 and Figure 4).

The decarbonisation trajectories used by signatories of the Poseidon Principles rely on two assumptions:

- the projections of transport demand for different shipping sectors out to 2050, including those available in the Fourth IMO GHG Study; and
- the total CO_2e shipping emissions permitted to be in-line with the 2023 IMO GHG Strategy.

They are produced by calculating a decarbonisation-consistent emissions intensity trajectory up to 2050. The method is derived from IMO Secretariat commissioned data sources, mainly the Fourth IMO GHG Study. Assumptions for formulating the trajectories are also taken from the 2023 IMO GHG Strategy, including the use of interim targets and a 2008 baseline. While the trajectories are kept up to date with the latest available research and will be refined to align with the IMO's projections over time, they have uncertainties because of the assumptions listed above.

The decarbonisation trajectories are produced for each ship type in a format that allows for portfolio aggregation, to ensure climate alignment is practical, straightforward, and comparable between signatories. The decarbonisation trajectories used by signatories to calculate climate alignment can be found in Appendix 3.[5]

5 In order to harmonise a discrepancy observed between the emission factors used for reporting in 2024 and the conversion factors used to convert the 2008 emissions budget from a tank-to-wake CO_2 to a well-to-wake CO_2e perspective, the trajectories were updated in July 2025.

2.5 Aggregating alignment for product and portfolios

After the climate alignment of each vessel in scope within the portfolio is calculated, an aggregated climate alignment score is calculated by following the steps below. This aggregated climate alignment score is disclosed publicly by all signatories each year.

Steps for calculating climate alignment of the portfolio:

1. For each vessel in a relevant financial product, use Equation 3 to calculate the vessel climate alignment score at time ***t***.
2. Using Equation 4 below, calculate an aggregated climate alignment score (Δp) using the weighted averages of the vessel climate alignment scores based on the debt outstanding of each vessel in the portfolio.[6]

In Equation 4 w_i is the vessel's debt outstanding as a share of the total debt outstanding and Δ_i is the vessel alignment, from Equation 3.

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

Equation 4

6 See specific guidance for calculations on the next page.

Specific guidance for calculations:

- When lenders are aggregating alignment scores to the portfolio level, the weighted average should be computed using the outstanding loan amount on 31 December of the year for which climate alignment is measured.
- When lessors are aggregating alignment scores to the portfolio level, the weighted average should be computed using outstanding capital payments under the lease on 31 December of the year for which climate alignment is measured.
- When guarantors are aggregating alignment scores to the portfolio level, the weighted average should be computed using amount outstanding under guarantee on 31 December of the year for which climate alignment is measured.
- The AER or cgDIST calculation for a vessel should be based on a full calendar year as provided in IMO MEPC RESOLUTION MEPC.278(70) (i.e., 01 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 or cgDIST calculation can instead be based on a period shorter than a calendar year. However, the requirement for provision of a SoC and/or a Verification Letter for an applicable reporting period (including a period shortened as above) shall remain unaffected.
- The total debt outstanding should be based on the outstanding capital of those vessels included in the aggregated climate alignment calculation for a given time. In other words, if a vessel is in scope of reporting, but for some reason a signatory cannot access the relevant data, this vessel's outstanding debt should not be included in the total debt outstanding when calculating aggregated climate alignment.
- When calculating the climate alignment of products with guarantees, the Poseidon Principles do not attempt to avoid double counting. For example, if an ECA guarantees a loan, it should base climate alignment calculations on the portion of that loan that it covers. The lender should disregard the guarantee and base climate alignment calculations on the outstanding loan amount on 31 December of the year. In their disclosures of their portfolio climate alignment, signatories are welcome to recognise that there may be some double counting in the case of guarantees.
- Where there may be multiple lenders involved in one transaction, such as in a syndicated loan, an individual signatory should base climate alignment calculations on only its portion of that loan.
- When calculating the climate alignment of unsecured ECA products, the loan is always established to finance a specific commercial contract, and in the case of shipping, the loan agreement is linked to an identified ship. The signatory should therefore include these vessels within the scope of the Poseidon Principles, and use this information to calculate product climate alignment.
- In the case of a bilateral facility which has been structured to include a loan amount notionally allocated to a particular vessel, that vessel's outstanding debt, for the purposes of Poseidon Principles reporting, can be the loan amount allocated that is consistent with the commercial intent in the original loan agreement.

- For ECAs, reinsurance financing should not be included in the scope of reporting. There is already double counting with ECA guarantees, so including reinsurance would be triple counting, provided the ECAs fronting the financing (i.e., receiving the reinsurance from the other ECA) are including the amounts in their scope.
- For signatories wishing to voluntarily calculate additional climate alignment scores for the cargo vessels in their portfolio, the following vessel categories should be included: bulk carrier, chemical tanker, container, general cargo, liquefied gas tanker, oil tanker, other liquids tankers, refrigerated bulk, Ro-Ro, and vehicle.
- For signatories wishing to voluntarily calculate additional climate alignment scores for the passenger vessels in their portfolio, the following vessel categories should be included: cruise, ferry-pax only, ferry-RoPax.

Example: Calculating alignment at the vessel and portfolio level

In this example, a signatory starts measuring its climate alignment in 2024. Table 1 illustrates a simple example of a portfolio with two products and shows the alignment deltas for each vessel within each product in the portfolio. The portfolio alignment delta shown in Table 2 is calculated using a weighted average according to Equation 4. Weighting is applied according to the debt outstanding designated to each vessel.

Financial Product	Year	IMO number	Actual emissions intensity (gCO_2e/tnm)	2023 IMO GHG Strategy - Minimum		2023 IMO GHG Strategy - Striving		Debt outstanding (million $)	Debt outstanding (Share of Portfolio)
				Required emissions intensity (gCO_2e/tnm)	Climate alignment	Required emissions intensity (gCO_2e/tnm)	Climate alignment		
1	2024	######	6.72	4.30	56.28%	4.10	63.90%	150	19%
1	2024	######	29.06	38.60	-24.72%	37.20	-21.88%	150	19%
2	2024	######	6.04	4.70	28.51%	4.60	31.30%	100	13%
2	2024	######	10.04	8.50	18.12%	8.20	22.44%	400	50%

Table 1.
Vessel alignment calculations

Financial product	Capital exposure (million $)	2023 IMO GHG Strategy - Minimum - climate alignment	2023 IMO GHG Strategy - Striving - climate alignment
Portfolio	800	19%	23%

Table 2.
Portfolio alignment

3

Accountability and enforcement

This section provides the requirements and guidance for both the accountability and enforcement principles for the sake of clarity and simplicity. In implementation, both principles are closely related throughout the four steps of the information flow process. At each step, the requirements that signatories must abide by are identified.

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

The Poseidon Principles use emissions intensity as the metric to measure climate alignment. The Poseidon Principles use the same information provided to the IMO DCS, which is mandatory for all ships of 5,000 gross tonnage and above engaged on international trade. Because of this, the Poseidon Principles rely specifically on AER and cgDIST as the emissions intensity metric.[7]

7 The rationale for this decision is fully discussed in Section 2.1

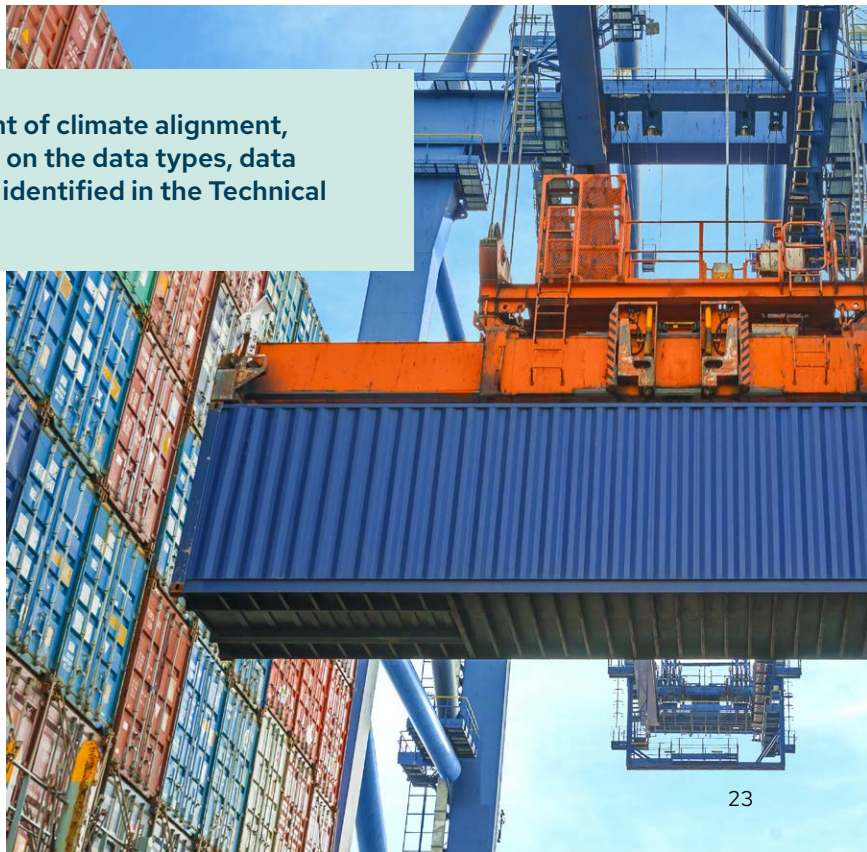
3.1 Accountability

PRINCIPLE

> We recognise the important role that classification societies and other IMO recognised organisations play in providing unbiased information to the industry and the mandatory regulation established by the IMO for the data collection and reporting of fuel consumption from ships to the IMO DCS. We will rely on such entities and mandatory regulations as explicitly identified in the Technical Guidance for the provision of information used to assess and report on climate alignment.

REQUIREMENTS

For each step in the assessment of climate alignment, signatories will rely exclusively 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 is made contractual in our new business activities using standardised covenant clauses. We will contribute to the update and addition of standardised clauses through the annual review process.

REQUIREMENTS

Signatories will agree to work with clients and partners to gather the necessary information to calculate emissions intensity and assess climate alignment.

3.3 Requirements at each information flow step

This section is broken into four information flow steps. The intent of this section is to clearly demonstrate how information flows between parties to abide by the accountability and enforcement principles. Specific accountability requirements regarding data types, data sources, and service providers are stated at each step. The enforcement requirement of using a standardised covenant clause is referenced, but the clause itself is available from the Secretariat. The Poseidon Principles' information flow process relies on data that shipowners are required to report to be in compliance 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 to, and pre-date, the Poseidon Principles.

Figure 7 provides an overview of the potential information flow pathways. The pathways are divided into preferred and allowed pathways tracks. Preferred pathways are those that rely on IMO-ROs to maintain data veracity and confidentiality.

Once a signatory has chosen to follow either the preferred or allowed pathways track, any options available can be used for the four steps within that track. For example, if a signatory chooses to follow the allowed pathways track, any of the three options for steps 2 and 3 can be used (i.e., internal, RO, or third party).

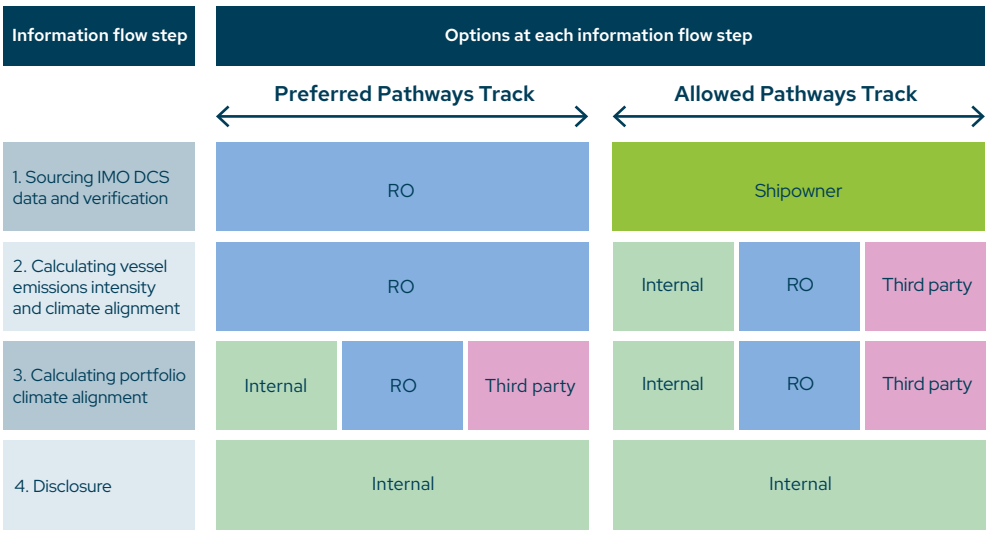


Figure 7.
Information flow pathway tracks

Step 1 Sourcing IMO DCS data and verification

Step 2 Calculating vessel emissions intensity and climate alignment

Step 3 Calculating portfolio climate alignment

Step 4 Disclosure

3.3.1 Step 1: Sourcing IMO DCS data and verification

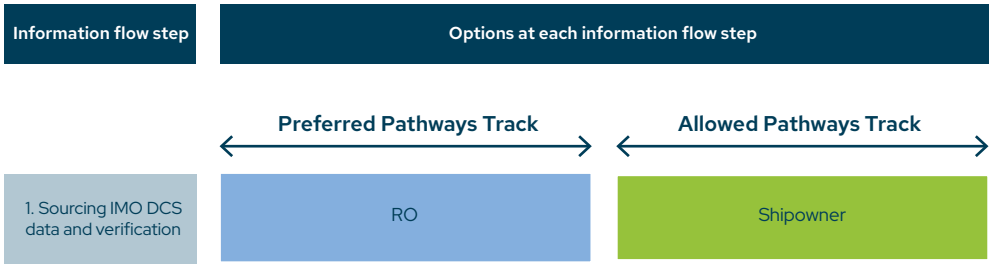


Figure 8.
Data sourcing options

Step 1 requires the sourcing of IMO DCS data and an SoC or a Verification Letter. As Figure 8 indicates, sourcing data from an RO is preferable while sourcing data from the shipowner is allowed.

Two methods can be used to source data that interact with pre-existing IMO DCS requirements, as shown in Figure 9 below. Under IMO DCS requirements, the shipowner provides the specified data to the RO. The RO checks and verifies the data is in accordance with IMO regulation, issues an SoC or a Verification Letter to the shipowner and then submits the data to the IMO Ship Fuel Oil Consumption Database.

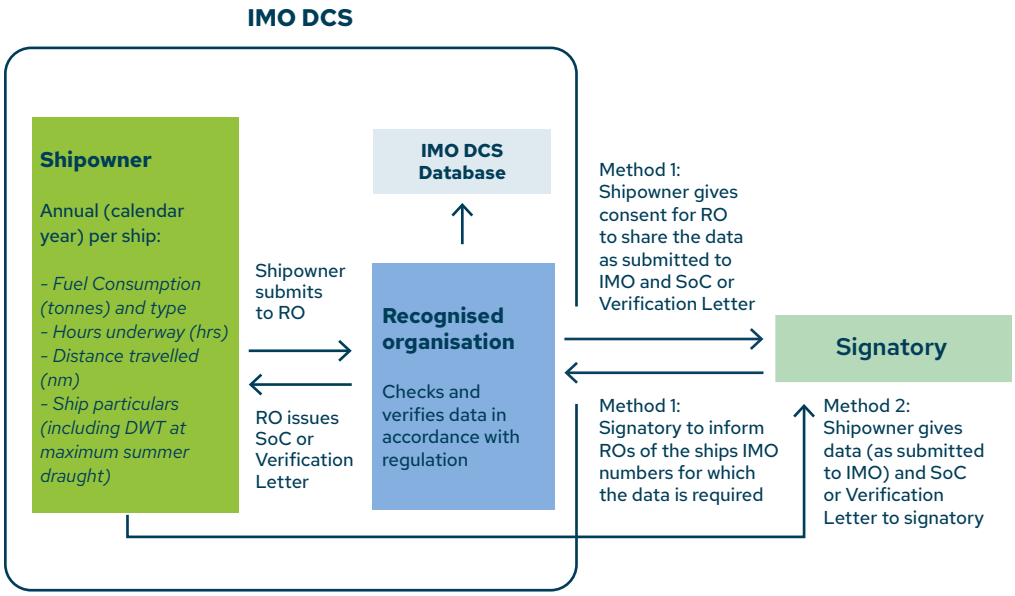


Figure 9.
Methods for sourcing vessel IMO DCS data

Method 1 (Preferred Pathways Track): RO(s) provide data and a SoC or a 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 Pathways Track): Shipowner(s) provide data and a SoC or a Verification Letter to signatory. The signatory requests the shipowner provide the data as submitted to the IMO DCS and the SoC or 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 transactions with multiple lenders:
Where there may be multiple lenders involved in one transaction, such as in a syndicated loan, 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 RO, it is in their interest 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 a RO or from the shipowner.
2. IMO DCS data may only be used if it is accompanied by a SoC or a Verification Letter provided by a RO.

3.3.2 Step 2: Calculating vessel emissions intensity and climate alignment

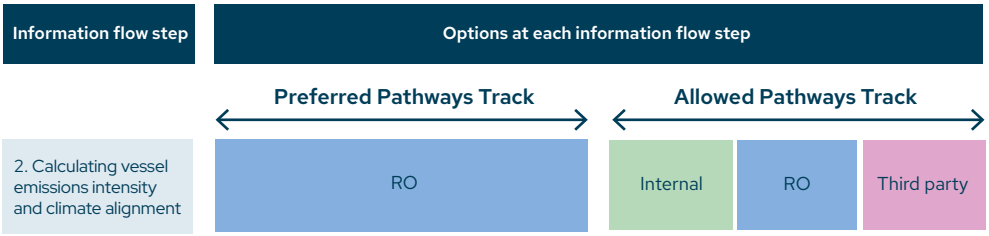


Figure 10.
Vessel alignment calculation options

Step 2 requires the calculation of vessels emissions intensity using the IMO DCS data and the calculation of vessels' alignment with decarbonisation trajectories. There are three methods for undertaking these calculations, shown in Figure 11 below. Method 1 is relevant only to the preferred pathways track, while method 2 and 3 are relevant to the allowed pathways track.

AER and cgDIST are used to measure emissions intensity and are detailed in Section 2.1. The IMO DCS data used for these calculations are also detailed in Section 2.1. Standard decarbonisation trajectories for each ship type are produced specifically for the purposes of the Poseidon Principles so that all calculations are made in the same way.[8] These are available through the Poseidon Principles Secretariat. Figure 11 demonstrates the necessary information, where to source it, and who can perform calculations.

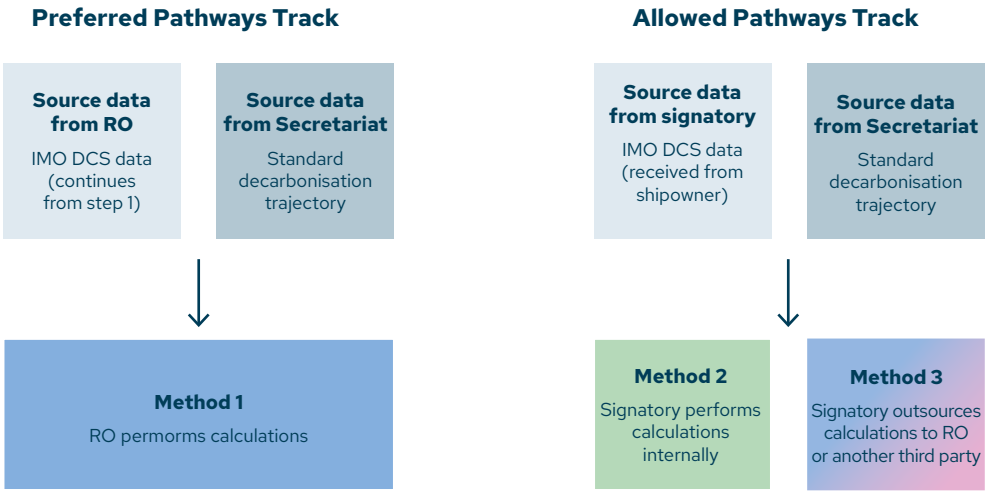


Figure 11.
Methods for calculating emission intensity and vessel climate alignment

8 See guidance in Section 2.4 and Appendix 3 for further information.

Method 1 (Preferred Pathways Track): RO calculates vessel emissions intensity and climate alignment on behalf of the signatory.

1. The RO will source the standard decarbonisation trajectories from the Secretariat.
2. The RO calculates vessel emissions 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 emissions intensity (AER/cgDIST) of the vessel(s) and the decarbonisation delta for the vessel(s), the IMO DCS data, and the SoC or Verification Letter.

Method 2 (Allowed Pathways Track): Signatory uses data provided by shipowner(s) to make vessel emissions intensity and climate alignment calculations internally.

1. Using the verified IMO DCS data as submitted to the flag state provided by the shipowner and the standard decarbonisation trajectory, the signatory calculates emissions intensity and climate alignment of the vessel(s).

Method 3 (Allowed Pathways Track): After receiving data from shipowners, signatory outsources emissions intensity and climate alignment calculations to an RO or another third party.[9]

1. After selecting a RO or another third party in accordance with accountability requirements below, the signatory should send the verified IMO DCS data, an SoC or a Verification Letter, and the standard decarbonisation trajectories to that party.
2. The RO or other third party calculates vessel emissions 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 emissions intensity (AER/cgDIST) of the vessel(s) and the decarbonisation delta for the vessel(s).

How to meet the requirements

- Vessel emissions intensity and climate alignment calculations must rely solely on verified IMO DCS data (i.e., data for which a SoC or a Verification Letter has been issued) and standard decarbonisation trajectories provided by the Poseidon Principles Secretariat.
- Vessel emissions intensity and climate alignment calculations can be performed by signatories, ROs, or other independent third parties (i.e., those that are not ROs).

9 If a third party other than an RO is used, that third party must be regarded as independent and have no shipbroking or commercial vessel interests.

3.3.3 Step 3: Calculating portfolio climate alignment

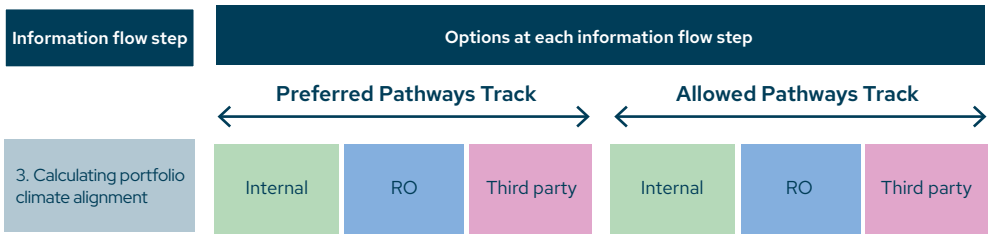


Figure 12.
Portfolio alignment calculation

Step 3 requires the calculation of portfolio climate alignment using the vessel climate alignment data from step 2 and signatories' loan book data (i.e., debt outstanding). There are two methods for undertaking this calculation. Method 1 and 2 are applicable in both the preferred pathways and allowed pathways tracks. This is due to the sensitivity of loan book data.10

Figure 13 demonstrates which data is necessary and who can perform the calculations.

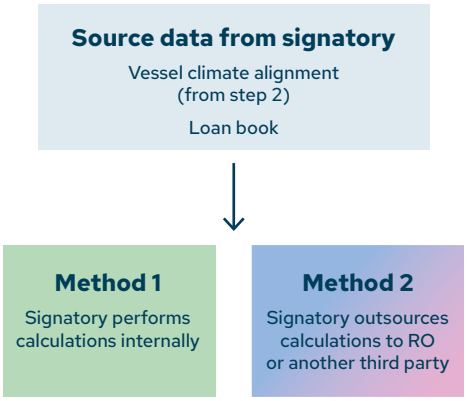


Figure 13.
Methods for calculating portfolio climate alignment

Method 1 (Preferred and Allowed Pathways Track): Signatory performs portfolio climate alignment calculations internally.

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

10 For a full calculation methodology, see Section 2.5 of the Technical Guidance.

Method 2 (Preferred and Allowed Pathways Track): Signatory outsources portfolio climate alignment calculations to an RO or another independent third party.

1. After selecting a RO or another independent third party in accordance with accountability requirements below, the signatory should send climate alignment and loan book data for all vessels within the scope of the Poseidon Principles to that party.
2. The RO or other independent third party calculates the signatory's portfolio climate alignment using climate alignment and loan book data for all vessels within the scope of the Poseidon Principles.
3. The RO or other independent third party provides the signatory with its portfolio climate alignment score.

How to meet the requirements

1. Vessel emissions intensity and climate alignment calculations must rely solely on verified IMO DCS data (i.e., data for which a SoC or a Verification Letter has been issued) and standard decarbonisation trajectory provided by the Poseidon Principles Secretariat.
2. Portfolio climate alignment calculation can be performed by signatories, ROs, or other independent third parties (i.e., 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.

Note: The AER calculation for a vessel shall be based on a full calendar year as provided in IMO MEPC RESOLUTION MEPC.278(70) (i.e., 01 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 a SoC and/or a Verification Letter for an applicable reporting period (including a period shortened as above) shall remain unaffected.

3.3.4 Step 4: Disclosure

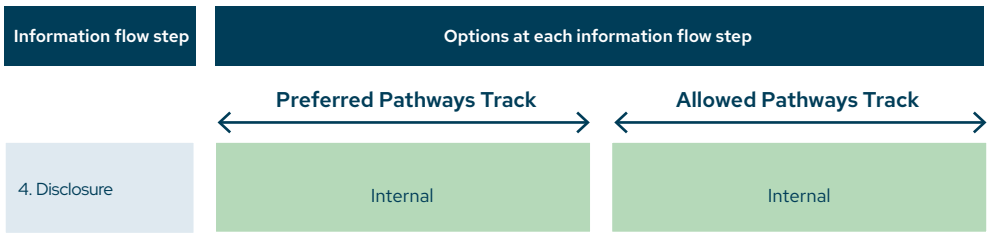


Figure 14.
Disclosure

Step 4 establishes disclosure requirements that will serve as a quality control mechanism. Signatories evaluate the specific information required for reporting each year and submit it using the Signatory Reporting Template, which is available from the Secretariat. Some information is publicly disclosed, and other information is only disclosed internally to other signatories to inform the actions of the Steering Committee. There is one method for disclosure, applicable to both the preferred and allowed pathway tracks.

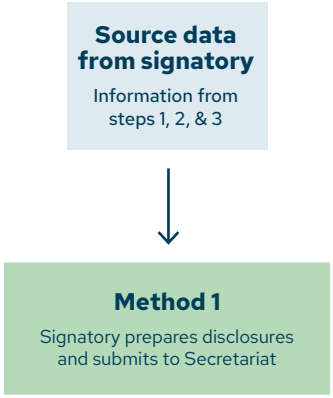


Figure 15.
Method for disclosure

Method 1 (Preferred and Allowed Pathways Track): Signatory prepares the information for disclosure and submits it to the Secretariat by the agreed-upon deadline. The following information is currently required to be submitted to meet the disclosure requirements:

1. Portfolio climate alignment scores as calculated using the methods described in Section 2. It is also optional to disclose additional separate climate alignment scores for only passenger and only cargo vessels.
2. Answers to open-ended questions and a quote from a head of shipping or similar. Some answers are disclosed publicly, and others only internally.
3. The proportion of in-scope activities included in reporting. If a signatory cannot collect data for some portion of its eligible portfolio, the percentage of its eligible portfolio which has been included in reporting should be calculated. This percentage should be calculated against the percentage of the signatory's debt in the portfolio, relying on the methodology outlined in Section 2.5. Note that the proportion of reported activities is based on the debt in a portfolio, rather than the number of vessels.

4. The proportion of the disclosed portfolio for which the preferred and allowed pathway tracks were used, along with the names of the providers (i.e., ROs or third parties), if used in steps 1-3. When calculating these percentages, the signatory should rely on the methodology outlined in Section 2.5. This information is only disclosed internally.
5. Additional information as indicated in the Signatory Reporting Template, and adjusted by the signatories as relevant.

How to meet the requirements

The signatory should provide the information listed above to the Secretariat in line with transparency requirements identified in Section 4.

Example: Meeting the public disclosure requirements

In this example, a signatory successfully completes the assessment of its portfolio climate alignment and discloses the public information as requested on the Signatory Reporting Template. Additional information must be disclosed internally, only between the signatories and the Secretariat. The up-to-date template, which displays all public and internal disclosures, is available from the Secretariat.

CLIMATE ALIGNMENT SCORE	2023 IMO GHG Strategy Minimum	2023 IMO GHG Strategy Striving
Total climate alignment score	19%	23%
Climate alignment score for all cargo vessels (OPTIONAL)		
Climate alignment score for all passenger vessels (OPTIONAL)		

Open ended questions	
What are your key takeaways from your climate alignment score? *	Our climate alignment score shows steady progress, although our portfolio remains slightly misaligned with the 2023 IMO GHG trajectories. The score helps identify which segments require further attention, and confirms that our collaboration with clients is having a positive impact.
How have the Poseidon Principles influenced your business activities and decision-making, or how will they inform these areas in the future?	The Poseidon Principles have become an essential tool for integrating decarbonisation into our lending strategy. We use climate alignment scores to assess risk, inform lending terms, and support clients transitioning to lower-emission fleets. The data also shapes our internal policies and sustainability targets in line with IMO ambitions.

Quote	
Quote (from head of shipping or similar)	"Climate alignment data is no longer just a reporting metric—it's a strategic compass. It enables us to better support our clients while advancing maritime decarbonisation."
Quotee	Poseidon Pelagaios Head of Sustainable Shipping Finance

Reporting percentages	
Portion of eligible shipping portfolio reported (against % of signatory's debt in portfolio)	98%
Portion of eligible shipping portfolio not reported (against % of signatory's debt in portfolio)	2%

Table 3.
Example of a signatory's public disclosure submission

3.4 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, there is a standard covenant clause. There is also a form of letter to be sent by signatories to shipowners to request the data. The clause and supporting definitions together with the form of letter are available from the Secretariat.

How to meet the requirements

In all new business activities that are finalised after a financial institution becomes a signatory to the Poseidon Principles, the signatory will use its best efforts to include definitions and covenant wording set out in the covenant clause in relevant documentation, amended where necessary, to reflect the signatory's proposed method of data collection.

4

Transparency

This section states the requirements for the transparency principle and provides the expectations and intent of each requirement. It also provides an outline of the timeline for the participation in and compliance with the Poseidon Principles.

PRINCIPLE

> **We will publicly acknowledge that we are a signatory of the Poseidon Principles and we will publish the results of the portfolio climate alignment score of our business activities on an annual basis in line with the Technical Guidance.**

REQUIREMENTS

1. **Upon becoming a signatory, the financial institution will publicly acknowledge that it is a signatory of the Poseidon Principles.**
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 15 November. This requirement takes effect for each signatory in the calendar year after the calendar 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 Information flow

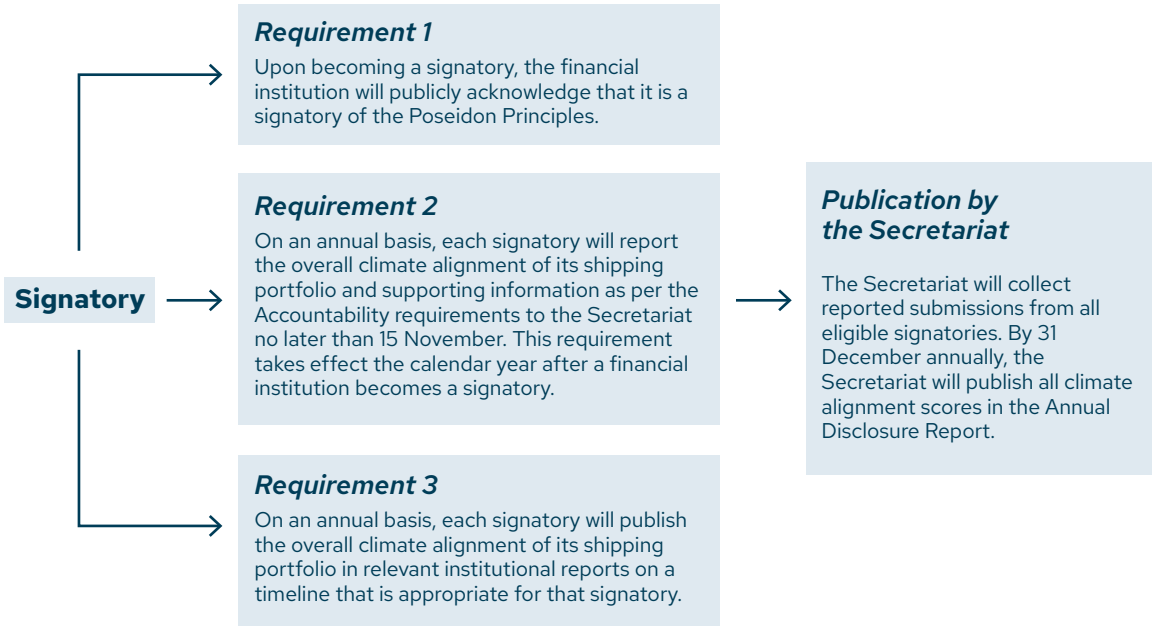


Figure 16.
Information flow for transparency requirements

Figure 16 demonstrates the information flow for each transparency requirement. Below, expectations and intent of each transparency requirement are further clarified.

How to meet the requirements

1. The expectations of transparency requirement 1 are that a signatory should make it publicly known that it is a signatory to the Poseidon Principles in a manner that is suitable for its organisation. The intent of this requirement is to increase awareness of the Poseidon Principles and to ensure it is clear which organisations are signatories without creating any significant burden to them.
2. The expectations of transparency requirement 2 are that a signatory should report all required information to the Poseidon Principles 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 principles. The intent of this requirement is to ensure that accurate information can be published by the Poseidon Principles Secretariat in a timely manner. The required reporting timeline is intended to create as little burden as possible to 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 intent of this requirement is not to specify precisely where this information should be published, but instead to ensure awareness of the Poseidon Principles.

Example: Transparency

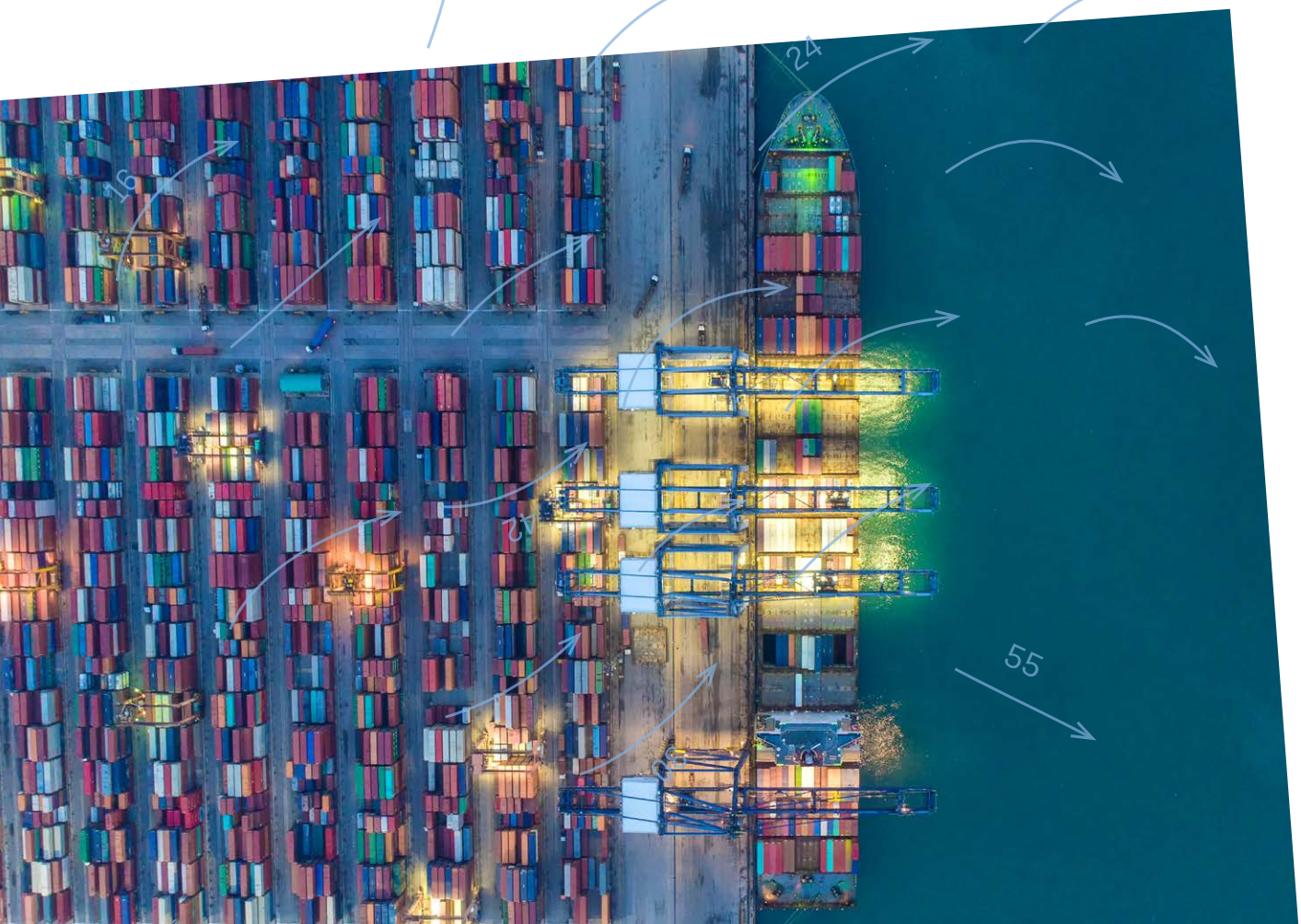
In this example, a lender becomes a signatory of the Poseidon Principles in November 2023.

Requirement 1: Lender issues a press release announcing that it is a Poseidon Principles signatory in November 2023.

Requirement 2: Prior to 15 November 2024, the signatory submits its portfolio climate alignment scores (for 2023) and supporting information as per the accountability requirements.

Requirement 3: The signatory includes its portfolio climate alignment scores in its annual sustainability report in line with their internal timeline.

Publication by the Poseidon Principles Secretariat: All eligible signatories' climate alignment scores will be published online prior to 31 December 2024.



5

How to become a signatory

The following outlines the process for financial institutions 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 prospective signatories.

Institutions wishing to become a signatory of the Poseidon Principles must:

1. Complete and send the Standard Declaration, Signatory Application, and Membership Agreement to the Secretariat.
2. Complete and submit the Self-Assessment to the Secretariat within five months of becoming a signatory.

All documents are available from the Secretariat.

5.1 Standard Declaration

The Standard Declaration is the formal commitment required of financial institutions to become a signatory. It announces the intent of the financial institution to follow all requirements of the Principles. In other words, it means that the institution is prepared to take the necessary steps to comply with all four Poseidon Principles, and will make this commitment and related reporting public.

5.2 Signatory Application

The Signatory Application outlines who is responsible for contact, reporting, invoicing, and other necessary functions to implement and maintain the Poseidon Principles within the financial institution.

5.3 Membership Agreement

The Membership Agreement is the formal agreement between the financial institution and the Poseidon Principles Association for the institution to become a signatory and a member of the Association. By signing the membership agreement, the signatory agrees to abide by the Governance Rules of the Association.

5.4 Self-Assessment

Each new signatory has five months to complete the Self-Assessment and return it to the Poseidon Principles Secretariat after joining. The purpose of this is to ensure that each signatory has made appropriate arrangements to fulfill 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 focus on ensuring that signatories are aware of timelines and obligations under the Poseidon Principles, have engaged internal stakeholders, have engaged clients, and have a plan for engaging the necessary service providers to complete their climate alignment assessment.

5.5 Timeline

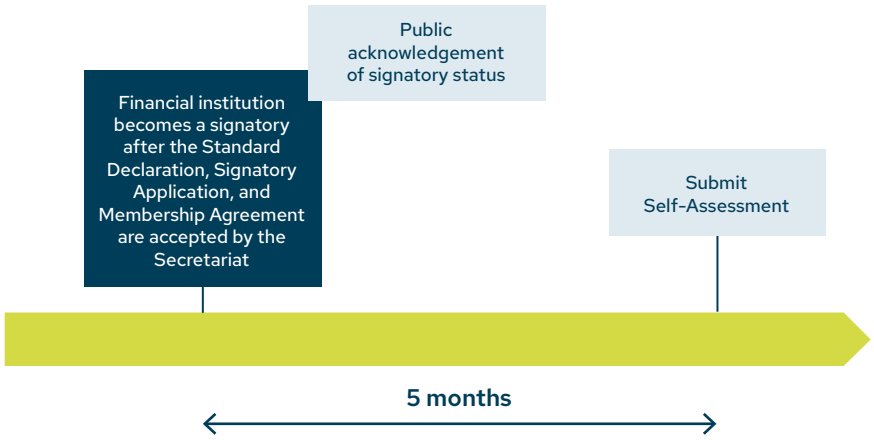


Figure 17.
Onboarding timeline

The Poseidon Principles aim to be easily implementable and achievable for each signatory. Figure 17 shows the onboarding timeline financial institutions can expect to follow when becoming a signatory.

5.6 Governance

Information regarding the creation of the Poseidon Principles Association, the selection of the Steering Committee, and the role of the Secretariat can be found in the Governance Rules of the Association, available on the website.

Appendices

Appendix 1

Definitions and abbreviations

AER is the Annual Efficiency Ratio, an emission intensity metric calculated in accordance with Equation 2 as set out in Section 2.1.

Business activity is defined as any credit product—including bilateral loans, syndicated loans, club deals, and guarantees—that is secured by vessel mortgage(s) or finance lease secured by title over vessel(s) and where that vessel, or unmortgaged ECA loans tied to a vessel, which have an established Poseidon Principles trajectory whereby the emissions intensity can be measured with IMO DCS data[11]. This scope may be amended or expanded by signatories in the future as per the annual review process.

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.

Climate alignment is the degree to which a vessel, product, or portfolio's emission intensity is in line with a decarbonisation trajectory that meets the 2023 IMO GHG Strategy ambition of reducing total annual well-to-wake GHG emissions to net-zero around 2050. This should also take into account the interim checkpoints in 2030 (20% reduction, striving for 30% on 2008 levels) and 2040 (70% reduction, striving for 80% on 2008 levels).

Continuous baselines avoid bias against vessels based on their position within a vessel category due to their size which could make alignment more challenging. This implies that the required emissions intensity is directly related to the size of the vessel through a power law relationship. Each vessel type has an annual continuous baseline that defines required emission intensity, and are defined in Appendix 3.

Decarbonisation trajectories are produced by the Secretariat based on agreed and clearly-stated assumptions. The current decarbonisation trajectories used by the Poseidon Principles define the rate of reduction of emissions intensity required to be aligned with the 2023 IMO GHG Strategy absolute emission reduction ambition. The method used for establishing the decarbonisation trajectories up to 2050 is derived from emission and transport work data from the Fourth IMO GHG Study.

DWT is deadweight tonnage at maximum summer draught, a measure of how much weight a ship is designed to carry.

ECA is an Export Credit Agency.

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.

Emissions intensity is the representation of the total well-to-wake emissions generated to satisfy a supply of transport work (grams of CO_2e per metric tonne-nautical mile [gCO_2e / tnm]). The Poseidon Principles use the AER metric for this calculation adapted to include upstream emissions as well as the impact of methane (CH_4) and nitrous oxide (N_2O).

GHG stands for Greenhouse Gas.

11 Where a vessel or vessels fall under the purview of the IMO and is required to submit data to the IMO DCS, i.e., vessels 5000 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 GISIS
(3) If still in doubt, please contact the Secretariat

IMO is the International Maritime Organization, a specialised 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.

LCA stands for IMO's Life Cycle Assessment model. This method refers to the assessment of GHG emissions from the fuel production to the end-use by a ship (well-to-wake); it results from the combination of a well-to-tank part (from primary production to carriage of the fuel in a ship's tank, also known as upstream emissions) and a tank-to-wake part (from the ship's fuel tank to the exhaust, also known as downstream emissions).

MARPOL (The International Convention for the Prevention of Pollution from Ships) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The MARPOL Convention was adopted on 2 November 1973 at IMO.

MEPC stands for IMO's Marine Environment Protection Committee.

RO stands for recognised organisation, which are an authorised organisations 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 authorised by some flag states.

Signatory is a financial institution or ECA that has sent a formal declaration to the Poseidon Principles Secretariat, has had that declaration accepted, and has had that declaration announced.

SoC is a Statement of Compliance issued by a flag state or an RO to the owner of a relevant vessel confirming its compliance with the IMO DCS.

Tank-to-wake emissions are from fuel combustion on board a vessel, or "operational emissions".

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 is a twenty-foot equivalent unit, a unit of cargo capacity often used to describe the capacity of container ships.

TNM is a metric tonne-nautical mile.

Verification Letter issued by an RO 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 includes the time spent in port for vessels sailing in international waters, as outlined by the IMO DCS requirements.

Well-to-tank emissions are from upstream activities including extraction, cultivation, production, processing, storage, transport, bunkering of fuels.

Well-to-wake emissions are a combination of tank-to-wake and well-to-tank emissions. This accounts for both the emissions from upstream activities and operation of a vessel, or the full life cycle.

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 IMO strategies. There are only suggestions made in the guidelines.

Carbon intensity measures considered for the Poseidon Principles are the Energy Efficiency Operational Indicator (EEOI) and the Annual Efficiency Ratio (AER) which are two measures used within IMO.

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 the vessel is continuously carrying cargo.
   - **b.** Because ships are not always fully utilised in terms of capacity and many ships (e.g., tankers and bulkers) operate with ballast voyages where for several voyages a year they have no cargo, this method typically underestimates carbon intensity.

Different metrics place different requirements on the data that is needed in their calculation. To ensure consistency in application of the Principles and ensure an apples-to-apples comparison between the calculations can be made by 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 • Aligned with IMO	• Not a true measure of transport work. Assumes all vessels are sailing continuously loaded on all voyages

Table 4.
Comparison of EEOI vs. AER

The CII regulation is undergoing a significant update at the moment. It is expected that the MEPC will update the regulations concerning these metrics accordingly. Similarly, amendments to the DCS regulation, which may include the reporting of cargo transported and distance sailed laden and would allow for annual EEOI to be compiled using DCS data, are currently being considered. The advisory will be assessing the developments at the IMO and considering the implications on the Poseidon Principles.

Appendix 3

Definition of the decarbonisation trajectories and vessel continuous baselines

Estimating the emissions intensity improvement required across all ship types

The overall improvement required in emissions intensity is calculated from:

1. a projection of the foreseeable growth in transport work across all ship types between the baseline year (2018) and the target year (2050), and;
2. the target CO_2e emissions defined by the 2023 IMO GHG Strategy absolute emission reduction ambition.

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 most aligned with decarbonisation in the wider economy, and most closely represents the rate of GDP and trade growth that has been observed in recent years. For each scenario, the Fourth IMO GHG Study employed two models for projecting transport work for non-energy products[12]. 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 decarbonisation 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 target CO_2e emissions is defined by the 2023 IMO GHG Strategy which has a net-zero target around 2050. Additionally, the strategy has indicative checkpoints for reductions of at least 20%, striving for 30% in 2030, as well as reductions of at least 70%, striving for 80% in 2040, all based on 2008 levels.

The 2023 IMO GHG Strategy is anchored to the same 2008 global emissions inventory that was estimated in the Third IMO GHG Study. This value of 921 Mt of operational tank-to-wake CO_2 is translated to a life cycle CO_2e value by using:

- A weighted average well-to-wake emission factor based on the fuel mix in 2008 from Lloyd's Register and UMAS.[13]
- 100-year global warming potential values aligned to IPCC Assessment Report 5 as used in the Fourth IMO GHG Study[14].

12 For a description of the full methodology employed to project transport work including energy products, see page 218 of the Fourth IMO GHG Study.

13 Lloyd's Register, & UMAS. (2019). Fuel production cost estimates and assumptions. The weighted average tank-to-wake CO2 to well-to-wake CO2e emission factor used is 1.157.

14 100 year global warming potential values used are 28 for methane (CH_4) and 265 for nitrous oxide (N_2O).

Table 5 presents the emissions budget translation from the Third IMO GHG Study to the 2023 IMO GHG Strategy minimum and striving numbers. These can then be used to build a global emissions budget by using historic data from the Third and Fourth IMO GHG Studies (2008 – 2018) and then linking the subsequent checkpoints linearly.[15]

	2008	2018	2030	2040	2050
Total transport demand (billion tonne nautical miles)	46003	59230	81804	100616	119429
Total CO_2e emissions (million tonnes) - 2023 IMO GHG Strategy - Minimum	1131.46	1127.85	905.17	339.44	0
Total CO_2e emissions (million tonnes) - 2023 IMO GHG Strategy - Striving	1131.46	1127.85	792.02	226.29	0
Estimated aggregate emissions intensity (gCO_2e/tnm) - 2023 IMO GHG Strategy - Minimum	24.60	19.04	11.06	3.37	0
Estimated aggregate emissions intensity (gCO_2e/tnm) - 2023 IMO GHG Strategy - Striving	24.60	19.04	9.68	2.25	0

Table 5.
Transport demand, CO_2e emissions, and emissions intensity for international shipping

Figure 18 plots the 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 emissions intensity reduction between 2018 and 2050. 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 2018 and 2030, 2030 and 2040, and down to 2050.

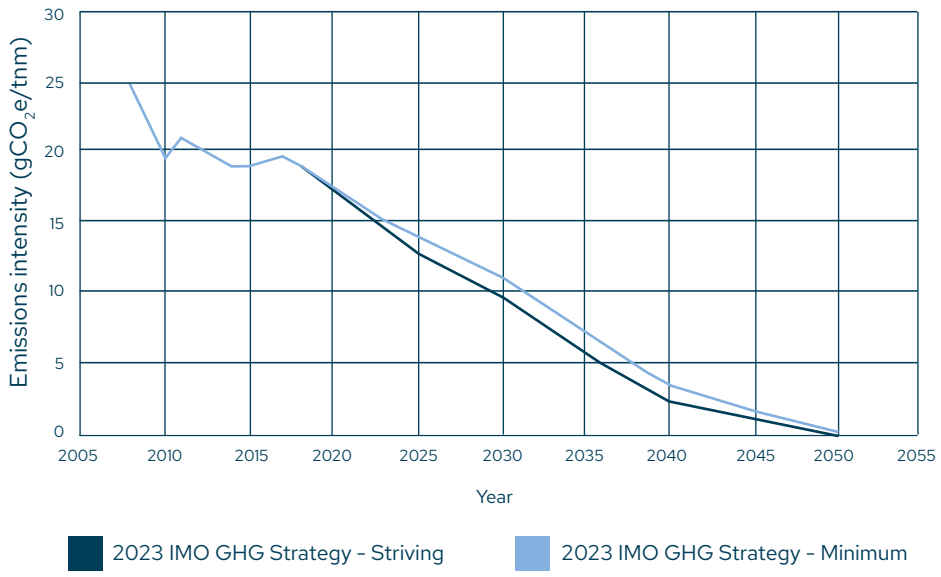


Figure 18.
Global fleet's emission intensity targets and trajectories defined by the 2023 IMO GHG Strategy

15 In order to harmonise a discrepancy observed between the emission factors used for reporting in 2024 and the conversion factors used to convert the 2008 emissions budget from a tank-to-wake CO_2 to a well-to-wake CO_2e perspective, the trajectories were updated in July 2025. This also resulted in a change to the 2008 emissions inventory shown in Table 5.

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 to overcome uncertainty introduced by projections relating to technology uptake or operational variation.

Calculating the target emissions intensity in a given year as a function of the ship type and size

The rate of reduction required per year is relative to the last historical data point (2018). The trajectories are shown relative to the 2018 emissions intensity (indexed to 2018 emissions intensity) in Figure 19. While the trajectory is presented for the time period 2018 to 2050, it is consistent with the 2008 baseline year as specified in the 2023 IMO GHG Strategy for the determination of interim checkpoints. The index value represents the required emissions intensity value relative to the emissions intensity in 2018.

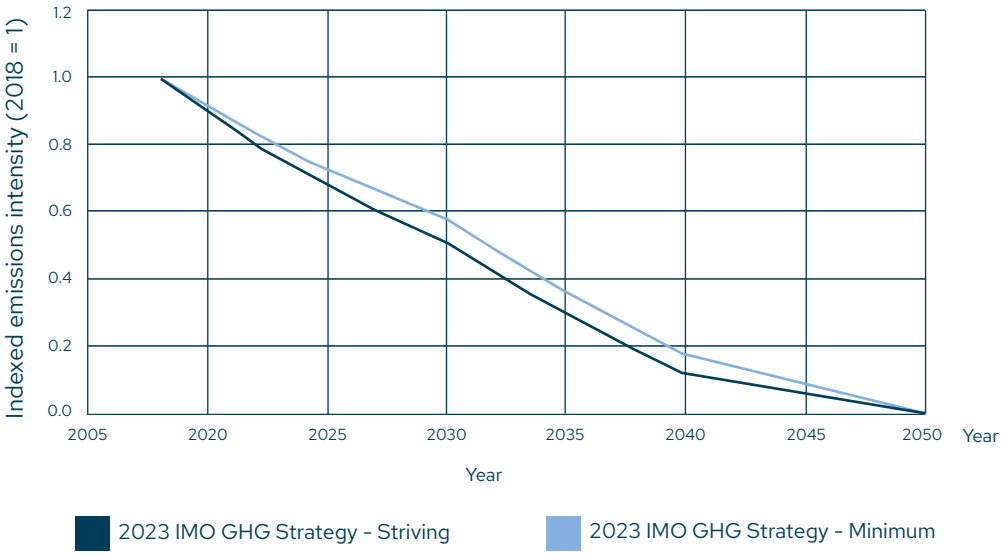


Figure 19.
Global fleet's emission intensity targets and trajectories defined by the 2023 IMO Strategy indexed to 2018

While the trajectory is presented for the time period 2018 to 2050, it is consistent with the 2008 baseline year as specified in the 2023 IMO GHG Strategy objectives as the end point is determined by a net-zero target in 2050 relative to the baseline.

Estimating vessel specific required emissions intensity

As of September 2023, the Poseidon Principles introduced continuous baselines to define the required emissions intensity for vessels. This approach mitigates the impact of discrete size categorisation alignment especially for vessels at the edges of existing vessel categories. Continuous baselines are widely used for maritime benchmarking such as by the IMO MEPC Energy Efficiency Design Index (EEDI) and the more recent Carbon Intensity Index (CII) regulation. A continuous baseline is provided for the required emission intensity values for each ship type covered in the Poseidon Principles. To obtain a continuous baseline, a curve is fitted through a plot of the median emissions intensity of each vessel size bin vs. the median vessel size in that bin. This is based on data published in the Fourth IMO GHG Study. The result is a power law fit with a high coefficient of determination (R^2). Based on the overall decarbonisation trajectory, a continuous baseline curve is obtained for each year up to 2050. Figure 20 shows the required emissions intensity values for an oil tanker in 2024.

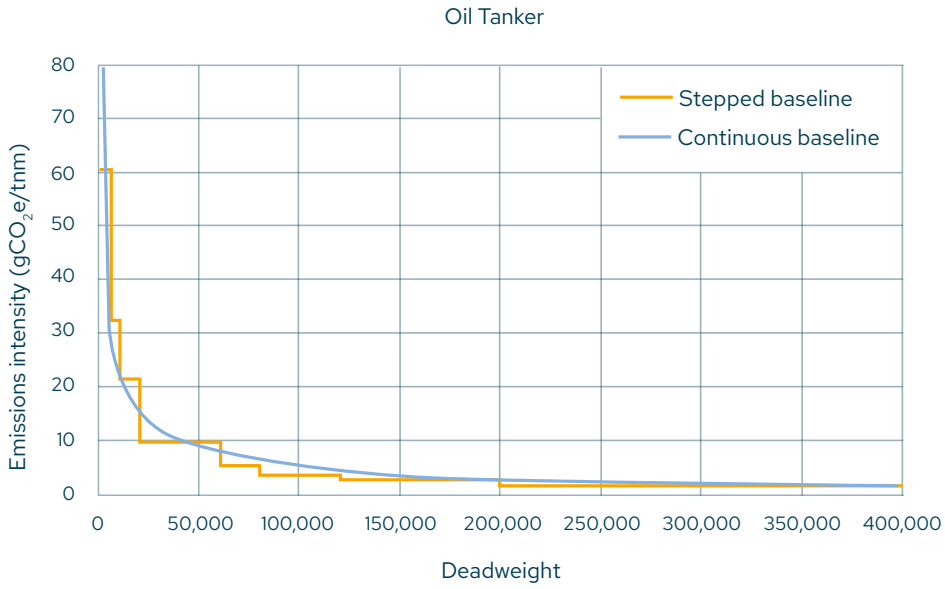


Figure 20.
Stepped and continuous required emissions intensity baseline for Oil Tankers in 2024 for the 2023 IMO GHG Strategy - Striving trajectory

The required emissions intensity can be expressed by the following expression:

$$r_s = (a.Year^3 + b.Year^2 + c.Year + d).Size^e$$

Where r_s is the required emissions intensity, **Year** is the year for which the emissions intensity is required and ***Size*** is the size of the vessel in question in deadweight tonnage (DWT), gross tonnage (GT), twenty-foot equivalent unit (TEU) or gas capacity (CBM). The coefficients ***a, b, c, d*** and ***e*** arising from the fitted curves can be found in Tables 6 and 7 for the 2023 IMO GHG Strategy minimum and striving trajectories.

Coefficients for the required emissions intensity equations (2023 IMO GHG Strategy – Minimum)							
Vessel type	**Category**	**Size units**	**a**	**b**	**c**	**d**	**e**
Bulk carrier (<279k DWT)	Cargo	DWT	0.209807568744	-1278.759470597230	2597760.34998260	-1758940375.93393	-0.621795966623
Bulk carrier (≥279k DWT)	Cargo	DWT	0.000086251453	-0.525695347839	1067.93385479	-723096.71523	0.000000000000
Chemical tanker	Cargo	DWT	0.764173554281	-4657.573487781470	9461716.61824572	-6406516823.45867	-0.708011940066
Container	Cargo	TEU	0.017046502279	-103,896996475603	211063.53785247	-142910864.97592	-0.428275282772
Cruise	Passenger	GT	3.404174776480	-20734.636616205800	42093803.95500010	-28482377259.21490	-0.781305544785
Ferry-pax only	Passenger	GT	0.295136718775	-1802.094784115290	3667631.02568721	-2487979888.87846	-0.555741051860
Ferry-RoPax	Passenger	GT	0.334879925367	-2044.332705778050	4159745.32397345	-2821202009.11277	-0.533655729715
General cargo	Cargo	DWT	0.039377010524	-239.999564521757	487551.69917650	-330120662.99436	-0.434668687862
Liquefied gas tanker (>100k CBM)	Cargo	CBM	0.000507847208	-3.095285981409	6287.97782480	-4257582.14344	-0.007986905824
Liquefied gas tanker (<100k CBM)	Cargo	CBM	0.127370369922	-776.311683062890	1577053.19558429	-1067820802.14883	-0.506409948411
Oil tanker	Cargo	DWT	0.911577369775	-5555.987335262890	11286816.58780650	-7642289794.81753	-0.710709096846
Other liquids tankers	Cargo	DWT	42798113.04877910	-260850896431.09500	529910535630003.00	-35880177967864900.00	-3.193817789625
Refrigerated bulk	Cargo	DWT	1.059012144962	-6454.589879463660	13112299.88892180	-8878322319.50608	-0.689615587971
Ro-Ro	Cargo	DWT	1.662761010298	-10134.388392135600	20587696.85914290	-13939904523.24710	-0.736571176805
Vehicle	Cargo	GT	1.614828099369	-9843.082629935810	19997657.70347210	-13541588729.99080	-0.798598669375

Table 6.
Coefficients for determination of required emissions intensity for vessel types under the 2023 IMO GHG Strategy - Minimum trajectory

Coefficients for the required emissions intensity equations (2023 IMO GHG Strategy - Striving)							
Vessel type	**Category**	**Size units**	**a**	**b**	**c**	**d**	**e**
Bulk carrier (<279k DWT)	Cargo	DWT	0.182598993274	-1111.05469566627	2253241.00726286	-1523049748.01772	-0.621795966623
Bulk carrier (≥279k DWT)	Cargo	DWT	0.000075066065	-0.45675226509	926.30267248	-626122.57072	0.000000000000
Chemical tanker	Cargo	DWT	0.665072869075	-4046.74922297428	8206887.86148983	-5547342006.09796	-0.708011940066
Container	Cargo	TEU	0.014835852556	-90.27127341307	183071.93680524	-123745159.22690	-0.428275282772
Cruise	Passenger	GT	2.865354751864	-17417.05915940180	35285556.69890570	-23825587568.26390	-0.781305544785
Ferry-pax only	Passenger	GT	0.284311154415	-1734.10730116203	3525419.88905340	-2388900844.41245	-0.555741051860
Ferry-RoPax	Passenger	GT	0.318318171617	-1941.05044542275	3945150.69861487	-2672645123.97326	-0.533655729715
General cargo	Cargo	DWT	0.034270462800	-208.52447176420	422891.77358201	-285848343.39370	-0.434668687862
Liquefied gas tanker (>100k CBM)	Cargo	CBM	0.000441987815	-2.68935018911	5454.05563977	-3686599.89812	-0.007986905824
Liquefied gas tanker (<100k CBM)	Cargo	CBM	0.110852537208	-674.50115569020	1367901.75080980	-924615880.04502	-0.506409948411
Oil tanker	Cargo	DWT	0.793360844934	-4827.33927673134	9789940.00630991	-6617386072.62061	-0.710709096846
Other liquids tankers	Cargo	DWT	37247904.84689040	-226641225353.47800	459632909968055.00	-31068304963874 2000.00	-3.193817789625
Refrigerated bulk	Cargo	DWT	0.921675765525	-5608.09328030137	11373324.64460950	-7687654883.90363	-0.689615587971
Ro-Ro	Cargo	DWT	1.447128377461	-8805.29925266498	17857321.90747640	-12070430790.04300	-0.736571176805
Vehicle	Cargo	GT	1.411635206714	-8590.43032126083	17423829.59329810	-11778980159.87730	-0.798598669375

Table 7.
Coefficients for determination of required emissions intensity for vessel types under the 2023 IMO GHG Strategy - Striving trajectory

Emission factors for well-to-wake CO_2e reporting

Aligning with the 2023 IMO GHG Strategy has required the Poseidon Principles to update its methodology from considering only tank-to-wake CO_2 emissions to well-to-wake CO_2e emissions. This requires the use of emission factors that cover the impact of the whole life cycle of the fuel as well as the relevant GHG species (carbon dioxide, methane, and nitrous oxide). The most pertinent source of these factors for the maritime industry is the life cycle assessment (LCA) guidance published at MEPC81.[16] These LCA guidelines should provide a widely accepted framework for defining emission factors, which should become the standard for the industry. However, it does not provide emission factors on all maritime fuels yet.

Following extensive advice from the Sea Cargo Charter and the Smart Freight Centre[17], the Poseidon Principles have established a set of well-to-wake emission factors based on the LCA guidelines and fill in the gaps, where necessary. The first set of emission factors was developed and used in 2023. Since then, the list has been updated to reflect the latest emission factors provided by MEPC and complemented with factors from Fuel.EU and other sources. Table 8 presents the emission factors to be used by signatories.

In the context of the Poseidon Principles, AER corrected to well-to-wake CO_2e, should be used as the metric for calculating vessel emissions intensity for the following vessel categories: bulk carrier, chemical tanker, container, general cargo, liquefied gas tanker, oil tanker, other liquids tanker, refrigerated bulk, and Ro-Ro. The cgDIST calculation, corrected well-to-wake CO_2e should be used instead of the AER calculation for the following vessel categories: cruise, ferry-pax only, ferry-RoPax, and vehicle.

16 MEPC approved terms of reference for the GESAMP Working Group on Life Cycle GHG Intensity of Marine Fuels (GESAMP-LCA WG).

17 The Smart Freight Centre are a leading authority involved actively across supply chain and logistics emissions accountancy including the Global Logistics Emission Council Framework (GLEC), ISO 14083 and offer advisory to the Sea Cargo Charter.

Emission factor list (default and granular factors)

	Fuel		LCV	WTT		TTW								WTW		Biogenic CO_2
Fuel Type	Fuel/engine specification	Notes	(MJ/g)	(gCO_2e /MJ)	(gCO_2e /g)	(gCO_2e /g)	(gCH_4 /g)	(gCO_2e/g) From CH_4	(gN_2O/g)	(gCO_2e/g) From N_2O	% methane slip	Total		g(CO_2e/ MJ)	**g(CO_2e/g)**	g(CO_2e/g)
												c(CO_2e/ MJ)	c(CO_2e /g)			
Heavy fuel oil (HFO)	Default	To be used when the exact grade of HFO is unknown	0.0402	16.8	0.675	3.114	0.00005	0.00149	0.000018	0.04914	0%	78.72%	3.165	95.52	**3.84**	-
	HFO (VLSFO)	ISO 8217 Grades RME through RMK, sulfur content is less than 0.5%	0.0402	16.8	0.675	3.114	0.00005	0.00149	0.000018	0.04914	0%	78.72%	3.165	95.52	**3.84**	-
	HFO (HSHFO)	ISO 8217 Grades RME through RMK, Sulfur content is greater than 0.5% (HSHFO)	0.0402	14.1	0.567	3.114	0.00005	0.00149	0.000018	0.04914	0%	78.72%	3.165	92.82	**3.73**	-
Light fuel oil (LFO)	Default	ISO 8217 Grades RMA through RMD	0.0412	13.2	0.544	3.151	0.00005	0.00149	0.000018	0.04914	0%	77.71	3.202	90.91	**3.75**	-
Diesel/Gas oil (MDO/MGO)	Default	To be used when the exact grade of MDO / MGO is unknown	0.0427	17.7	0.756	3.206	0.00005	0.00149	0.000018	0.04914	0%	76.27	3.257	93.97	**4.01**	-
	MDO/MGO (ULSFO)	ISO 8217 Grades DMX through DMB, Sulfur content less than 0.1%	0.0427	17.7	0.756	3.206	0.00005	0.00149	0.000018	0.04914	0%	76.27	3.257	93.97	**4.01**	-
	MDO/MGO (VLSFO)	ISO 8217 Grades DMX through DMB, Sulfur content between 0.1% and 0.5%	0.0427	14.4	0.615	3.206	0.00005	0.00149	0.000018	0.04914	0%	76.27	3.257	90.67	**3.87**	-
Liquefied petroleum gas (LPG)	Propane		0.0463	7.8	0.361	3.000	0.00005	0.00149	0.000018	0.04914	0%	65.89	3.051	73.69	**3.41**	-
	Butane		0.0457	7.8	0.361	3.030	0.00005	0.00149	0.000018	0.04914	0%	67.41	3.081	75.21	**3.44**	-

	Fuel		LCV	WTT		TTW						Total		WTW		Biogenic CO_2
Fuel Type	Fuel/engine specification	Notes	(MJ/g)	(gCO_2e /MJ)	(gCO_2e /g)	(gCO_2e /g)	(gCH_4 /g)	(gCO_2e/g) From CH_4	(gN_2O/g)	(gCO_2e/g) From N_2O	% methane slip	c(CO_2e/ MJ)	c(CO_2e /g)	g(CO_2e/ MJ)	**g(CO_2e/g)**	g(CO_2e/g)
Liquefied natural gas (LNG)	Default		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	3.5%	77.62	3.726	96.12	**4.61**	-
	Otto dual fuel (medium speed)		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	3.5%	77.62	3.726	96.12	**4.61**	-
	Otto dual fuel (slow speed)		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	1.7%	67.49	3.239	85.99	**4.13**	-
	LNG diesel		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	0.15%	58.76	2.821	77.26	**3.71**	-
	LBSI		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	2.6%	72.55	3.483	91.05	**4.37**	-
	Steam turbine & boilers		0.048	18.5	0.888	2.75	0	0	0.00011	0.03003	0.01%	57..97	2.783	76.47	**3.67**	-
Bio-LNG	Default		0.05	28.9	1.445	0	0	0	0.00011	0.03003	3.5%	19.62	0.981	48.52	**2.43**	2.86
	Otto dual fuel (medium speed)		0.05	28.9	1.445	0	0	0	0.00011	0.03003	3.5%	19.62	0.981	48.52	**2.43**	2.86
	Otto dual fuel (slow speed)		0.05	28.9	1.445	0	0	0	0.00011	0.03003	1.7%	9.84	0.492	38.74	**1.94**	2.86
	LNG diesel		0.05	28.9	1.445	0	0	0	0.00011	0.03003	0.15%	1.42	0.071	30.32	**1.52**	2.86
	LBSI		0.05	28.9	1.445	0	0	0	0.00011	0.03003	2.6%	14.73	0.736	43.63	**2.18**	2.86
	Steam turbine & boilers		0.05	28.9	1.445	0	0	0	0.00011	0.03003	0.01%	0.65	0.033	29.55	**1.48**	2.86
100% Bio-diesel	Default	(FAME)	0.0372	20.8	0.774	0	0.00005	0.00149	0.00018	0.04914	0%	1.36	0.051	22.16	**0.82**	2.83
100% Bio-Methanol	Default		0.0199	16.2	0.322	0	0.00005	0.00149	0.00001	0.0037	-	0.26	0.005	16.5	**0.33**	1.38
100% Bio-Ethanol	Default	1st generation biogenic	0.0268	47.9	1.284	0	0.00005	0.00149	0.00001	0.0037	-	0.20	0.005	48.1	**1.29**	1.91
100% HVO	Default		0.044	14.9	0.656	0	0.00005	0.00149	0.00018	0.04914	0%	1.15	0.051	16.05	**0.71**	3.12
Other	Hydrogen	Natural gas feedstock	0.12	132	15.84	0	0	0	-	-	-	0.00	0.000	132.0	**15.84**	-
	Ammonia	Natural gas feedstock	0.0186	121	2.251	0	0.00005	0.00149	-	-	-	0.08	0.001	121.1	**2.25**	-
	Methanol	Natural gas feedstock	0.0199	31.3	0.623	1.375	0.00005	0.00149	0.00001	0.0037	-	69.36	1.380	100.7	**2.00**	-
Biofuel blends	24% biodiesel (FAME)/ HFO	Based on default HFO and biodiesel (FAME) values	0.0394	17.8	0.701	2.32	0.00005	0.00149	0.00018	0.04914	0%	60.2	2.37	77.9	**3.07**	0.72
	30% biodiesel (FAME)/ HFO		0. 0393	18.0	0.707	2.13	0.00005	0.00149	0.00018	0.04914	0%	55.5	2.18	73.5	**2.89**	0.90
	24% biodiesel (FAME)/ MGO	Based on default MGO and biodiesel (FAME) values	0.0412	18.4	0.763	2.35	0.00005	0.00149	0.00018	0.04914	0%	58.3	2.40	76.7	**3.16**	0.75
	30% biodiesel (FAME)/ MGO		0.0409	18.6	0.765	2.15	0.00005	0.00149	0.00018	0.04914	0%	53.8	2.20	72.4	**2.96**	0.93

Table 8.

Well-to-wake emission factors for reporting (sources are IMO MEPC81 (green), Fuel.EU / RED II (light blue), IFEU / SFC (orange))

Considerations for reporting

Using the default emission factors

The DCS resolution does not specify the granularity to which fuels should be described in reporting and relies on MEPC.308(73) for tank-to-wake emission factors limited to eight generic maritime fossil fuels. This implies that signatories may not have access to the required information about fuel consumed and machinery on board to be able to report the most accurate emissions related to their activity. In the case that signatories only have basic DCS data, they are to use the default values marked in Table 8. If signatories have more granular data about fuels used and machinery on board (especially for LNG vessels), more specific emission factors corresponding to the information available to the signatory should be used. The Technical Committee trusts that signatories will be reporting to their best possible knowledge.

Machinery information

Given the issues around fugitive methane emissions from vessels, the distinction between different propulsion plants is important to be factored in given the high global warming potential of methane. Not all signatories may have ready access to the specifications of the vessels in their portfolio therefore the Technical Committee recommends the following sources for the identification of LNG propulsion type:

1. Documentation held by financing institutions that is related to classification including shipbuilding contracts, classification documents or the International Air Pollution Prevention Certificate (IAPP)
2. RO's acting as service providers who may have access to a vessel specification database
3. Authoritative industry vessel databases (may require verification due to inconsistency between databases).

If the above information is not enough to determine the engine type, Table 9 may be used to indicate the appropriate emission factor to be used in reporting. Table 9 is only an illustrative example and not an exhaustive list. Once again, signatories are expected to use the best of their knowledge to report in the correct way. If there is any doubt about the engine type, the default emission factor should be used.

Classification for emission factor selection	Industry reference	Alternative reference (examples from vessel databases)	Engine Type	Typical Makers / Models
LNG Otto (Dual Fuel -Medium Speed)	Dual Fuel Diesel Electric (DFDE)		4-stroke , Low pressure	CAT , Yanmar, Rolls Royce, MAN Diesel, Wartsila
LNG Otto (Dual Fuel - Slow Speed)	Low pressure Dual Fuel (LPDF)	2-Stroke Dual Fuel (Low Pressure)	2-stroke, Low pressure	MAN Diesel – ME-GA
LNG Diesel (Dual Fuel Slow Speed)	High Pressure Dual Fuel (HPDF)	2-Stroke Dual Fuel (High Pressure)	2-Stroke, High Pressure	MAN Diesel - ME-GI
LBSI	Low Burn Spark Ignited		4-stroke, Low Pressure	Rolls Royce, Bergen, Wartsila
Gas Turbine	Steam propulsion	Steam Turbine	NA	NA

Table 9.
Indicative LNG propulsion types for emission factor choice

Well-to-wake emission factor calculation approach

Keeping the logic of transparency to ensure legitimacy and credibility for any pragmatic way forward, the Poseidon Principles agreed to follow the cascading order of emission factor priority as set by the Sea Cargo Charter:

1. Emission factors approved by MEPC should be used, where available;
2. All other emission factors, or relevant input parameters, should be taken from the Fuel EU/ecoinvent where available;
3. Any other emission factors should be taken from sources aligned with the GLEC Framework emission factors.

Where MEPC81 has not provided a necessary data point as input to the calculation, this data has been sought from the final Fuel.EU regulation. Where there is still an input data gap, then the required data has been sourced from an alternative, well-established, peer-reviewed source for GHG emission factors that follows the approach set out in ISO 14083 and used in the GLEC Framework.

The well-to-wake emission factor is the sum of the well-to-tank and tank-to-wake values. The total tank-to-wake value includes the impact of any methane or nitrous oxide released to atmosphere, either as a result of methane slip or as a result of combustion. Note that methane slip also results in less fuel being combusted and this must be allowed for the calculation of the combustion elements. As an example, the LNG Otto dual fuel (medium speed) emission factor is calculated as:

Well-to-tank	Methane slip	Amount of fuel not combusted	Co_2 emissions as combustion product	Ch^4 as a combustion by-product	N_2o as a combustion by-product	Well-to-wake value
0.888 +	(0.035*29.8) +	(1-0.035)*	(2.75) +	(0*29.8) +	(0.00011*273))	=4.614g CO_2e/g

Table 10.
Example calculation of the well-to-wake emission factor LNG Otto duel fuel (medium speed)

About the latest update

In order to harmonise a discrepancy observed between the emission factors used for reporting in 2024 and the conversion factors used to convert the 2008 emissions budget from a tank-to-wake CO_2 to a well-to-wake CO_2e perspective, the trajectories and continuous baselines for all vessel types were updated in July 2025.

In addition, the liquefied gas tanker baseline was split into two separate baselines for those vessels greater than 100k CBM (mainly LNG tankers) and those less than 100k CBM (mainly LPG tankers), and a size cap was applied to the baseline for bulk carriers for vessels greater than 279k DWT.

The list of emission factors was also updated in July 2025 and thus some values differ from those used for reporting in the Annual Disclosure Report 2024 in the following ways:

- The updated emission factors are based on the global warming potential (GWP) from the latest IPCC 6th Interim Assessment Report (AR6), dated 2023 (i.e., Fossil CH_4 = 29.8, biogenic CH_4 = 27.2 and N_2O = 273). The IMO is currently using outdated values dating back to 2014 (IPCC AR5) and Fuel.EU used even older values dating back to 2007 (IPCC AR4). Given that there is no agreement between Fuel.EU and the IMO, there is no established common position from these two sources, so the Poseidon Principles decided to base the list of emission factors on the latest GWP figures from 2023. The expectation is for the IMO to update to the latest GWP figures from IPCC AR6 at some point.
- LFO and LPG values are lower due to a lower well-to-tank contribution to the total; potentially due to the new source (Fuel.EU) lagging in acknowledging the latest knowledge on methane emissions in the production phase.
- LNG and BioLNG in dual fuel medium speed engines are higher as the latest IMO value is higher than in earlier drafts or in Fuel.EU.
- Biodiesel (FAME) and HVO are lower as IMO now includes well-to-tank values that were not previously present, and which are lower than the RED II values included previously. Default emission factors for four common biofuel blends have been added to the list.
- All emission factors are now compiled in one single list for a better overview. Also, details on the composure of the factors and the respective sources are provided.
- As this is an evolving topic, the Poseidon Principles will keep evaluating the changing landscape of fuel lifecycle assessment and evaluate whether to update the Technical Guidance.

For complete details about the latest update, please refer to the 'Summary of changes to the Technical Guidance' available on the website.

Example: Calculating emissions intensity

Considering a typical 80,000 DWT Panama bulk carrier, the required emissions intensity in 2023 can be compiled as follows:

For the 2023 IMO GHG Strategy - Minimum trajectory

a: 0.209807568744	Year: 2024
b: -1278.75947059723	Size: 80000 DWT
c: 2597760.3499826	
d: -1758940375.93393	
e: -0.621795966623	

$$r_s = ((0.209807568744 * 2024^3) + (-1278.75947059723 * 2024^2) + (2597760.3499826 * 2024) + (-1758940375.93393)) * ((80000)^{(-0.621795966623)}) = 3.9\ gCO_2e/DWT\text{-}nm$$

For the 2023 IMO GHG Strategy - Striving trajectory

a: 0.182598993274	Year = 2024
b: -1111.05469566627	Size: 80000 DWT
c: 2253241.00726286	
d: -1523049748.01772	
e: -0.621795966623	

$$r_s = ((0.182598993274 * 2024^3) + (-1111.05469566627 * 2024^2) + (2253241.00726286 * 2024) + (-1523049748.01772)) * ((80000)^{(-0.621795966623)}) = 3.7\ gCO_2e/DWT\text{-}nm$$

Appendix 4

Future potential revisions to the Poseidon Principles trajectories

While the decarbonisation trajectories and the continuous baseline 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 the decarbonisation trajectories are reviewed at a minimum every five years, approximately consistent with the periodic release of new analysis (the IMO GHG studies). Any update to the decarbonisation trajectories should be applied for future climate alignment, not re-analysis of historical climate alignment. The parameters which may change include:

- Subsequent IMO GHG studies (released about every five years) and subsequent studies may update or modify the estimates of the historical emissions intensity and trends (e.g., if historical estimates are revised upwards, the emissions intensity objective will steepen).
- With the publication of the IMO life cycle assessment guidelines, the Poseidon Principles will review its approach to determining fuel life cycle GHG emissions with the intention to align with the IMO as much as possible. This a very dynamic landscape which will be consistently reviewed by the advisory team to ensure the most robust method for representing emissions is selected including fuel certification and emission factor verification.
- It is expected that the IMO DCS regulation will be updated in order to align with the 2023 GHG Strategy which will be considered when designing the future of the Poseidon Principles data collection regime. This is expected to include more data collection around fuel types used and machinery on board.
- Transport demand growth may develop differently to the estimate used here to calculate the emissions intensity trend consistent with a 2050 absolute objective (e.g., if demand growth exceeds the trend used in these calculations, the emissions intensity objective will steepen).
- Demand growth may develop differentially between ship types and increase the demand for ships with different emissions intensity than the 2018 fleet (e.g., if demand modifies the fleet composition to increase the share of emissions by ships which have higher emissions intensity, the emissions intensity objective will steepen).
- 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 (e.g., ice-classed ships).
- The next scheduled IMO discussion around GHG emission reduction is scheduled for 2028.

Acknowledgements

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Special thanks to all the signatories, Steering Committee and Technical Committee members who, through a continuous review of the methodology, ensure that the Poseidon Principles remain practical, effective, and ambitious.

The Poseidon Principles is one of three initiatives based on the same four Principles and developed with the Global Maritime Forum. Together with the Poseidon Principles for Marine Insurance and the Sea Cargo Charter, they share a common objective: fostering transparency on emissions reporting with the aim of contributing to reducing GHG emissions.

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