SCIENCE BASED TARGET-SETTING IN THE MARITIME TRANSPORT SECTOR

IN-DEPTH TRAINING WEBINAR

31 January 2023
VIDEO-CONFERENCE GUIDELINES

- This is a **zoom webinar**. Your camera and microphone are automatically muted.
- Participants can **send questions via the Q&A button**.
- Please participate in our **online polls**, launched throughout the webinar.
- **Slides from this webinar will be shared** after this meeting.
- Please note that this webinar will be **recorded** for the benefit of those who cannot attend.
AGENDA

1. Housekeeping and agenda
2. Introduction to the SBTi Maritime Guidance
3. Modelling maritime transport SBTs
4. Q&A
5. Closing
TODAY’S WEBINAR TEAM

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Principal Consultant
UMAS

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Technical Director
SFC
INTRODUCTION TO THE SBTi

What is the Science Based Targets initiative?

The Science Based Targets initiative (SBTi) is a global body enabling businesses and financial institutions to set ambitious emissions reductions targets in line with climate science.
TECHNICAL GUIDANCE AND TOOL

SCIENCE BASED TARGET SETTING FOR THE MARITIME TRANSPORT SECTOR

Version 1.0
November 2022
THE SBTi MARITIME GUIDANCE
80% of global trade by volume is carried by sea.

3% of global GHG emissions (~1GT of CO$_2$e).

Completely reliant on fossil fuels.

Highly heterogeneous (cargo categories, vessel types, vessel sizes, routes).

Long asset replacement cycles.

**THE CHALLENGE**

Decarbonizing a critical link of global trade
WHAT DOES MARITIME TRANSPORT GUIDANCE COVER?

All movement of goods and people on shipping vessels

- Ship owners
- Ferry operators
- Commodity traders
- Consumer goods companies
- Cargo owners
- Charterers
- Cruise companies
- Commuters
- Logistics service providers
- Ship operators
- Charter pools
- FLs portfolios, recreational, fishing not covered

A toolkit to **measure** carbon intensity of activity to **inform** decision-making around short-term **actions** towards a **long-term goal**
SHIP CATEGORISATION

- Comprehensive list provided in Technical Guidance and Tool based on IMO4 categorisation.

<table>
<thead>
<tr>
<th>Vessel type</th>
<th>SBTi vessel type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregates Carrier</td>
<td>Bulk carrier</td>
</tr>
<tr>
<td>Bulk Carrier</td>
<td>Bulk carrier</td>
</tr>
<tr>
<td>Bulk Carrier (with Vehicle Decks)</td>
<td>Bulk carrier</td>
</tr>
<tr>
<td>General Cargo/Tanker</td>
<td>General Cargo</td>
</tr>
<tr>
<td>Heavy Load Carrier</td>
<td>General Cargo</td>
</tr>
<tr>
<td>Heavy Load Carrier, semi submersible</td>
<td>General Cargo</td>
</tr>
<tr>
<td>Livestock Carrier</td>
<td>General Cargo</td>
</tr>
</tbody>
</table>
PATHWAY DESIGN

CARBON BUDGET

Well Below 2°C

15°C

TRANSPORT WORK DEMAND

CARBON INTENSITY
<table>
<thead>
<tr>
<th>1.5°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Establish carbon budget based on IMO4 and IPCC 1.5°C.</td>
</tr>
<tr>
<td>● Translate budget from TtW to WtW budget.</td>
</tr>
<tr>
<td>● Translate linear assumption to logistics (S-curve).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WB2°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Carbon budget projection from Energy Technology Perspectives 2017 published by the International Energy Agency.</td>
</tr>
<tr>
<td>● Well to wake provided at 5 year intervals.</td>
</tr>
<tr>
<td>● Linear interpolation.</td>
</tr>
</tbody>
</table>
CARBON BUDGET

- Well-to-Wake Emissions (Upstream + Operational).
- CO$_2$, N$_2$O, CH$_4$ (methane).
- IMO curve adapted to include WTT phase.
Carbon intensity: \[
\frac{\text{Total emissions}}{\text{Transport work}} = \frac{\text{total emissions}}{\text{distance sailed} \times \text{cargo carried}} = \frac{\text{gCO2eq}}{\text{T.nm}}
\]

Freight vessels: carbon intensity = \[
\frac{\text{gCO2eq}}{\text{T.nm}}
\]

Passenger vessels: carbon intensity = \[
\frac{\text{gCO2eq}}{\text{GT.nm}}
\]
CARBON INTENSITY

- Metric: $\text{gCO}_2 / \text{transport work}$. 

![Graph showing carbon intensity over years]
Comparing apples with apples

**CATEGORY SPECIFIC TARGET**

Carbon Intensity (gCO2e/MNm)

- Bulk carrier 0-9999 DWT
- Bulk carrier 200000+ DWT
- Oil tanker 20000-59999 DWT

Year:
- 2020
- 2025
- 2030
- 2035
- 2040
- 2045
- 2050

Temperature Levels:
- WB2°C
- 15°C
All targets must cover Well-to-Wake (WTW) emissions (in metric tonnes of CO₂ equivalent (CO₂e)).

WTW emissions are emissions generated across the life cycle of a fuel, from both upstream and operational activities.

They include both Well-to-Tank (WTT) emissions, generated in the fuel’s production and distribution, and Tank-to-Wake (TTW) emissions, generated in the combustion of the fuel.
## TARGET COVERAGE

<table>
<thead>
<tr>
<th>Type of shipping related emissions</th>
<th>WTW base year GHG emissions</th>
<th>Base year activity data*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vessel owners / operators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger</td>
<td>Scope 1</td>
<td>tonne-nautical mile</td>
</tr>
<tr>
<td>Freight</td>
<td>Scope 3</td>
<td>tonne-nautical mile</td>
</tr>
<tr>
<td><strong>Cargo shippers / Logistics Service Providers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger</td>
<td>Scope 3 category 6 or 7</td>
<td>tonne-nautical mile</td>
</tr>
<tr>
<td>Freight</td>
<td>Scope 3 category 4 or 9</td>
<td>tonne-nautical mile</td>
</tr>
</tbody>
</table>

* Except cruises
SECTOR SPECIFIC REQUIREMENTS*

**TARGET YEAR ELIGIBILITY**

- For all companies, near-term target year must be **no earlier than 2030**.

**TARGET AMBITION**

- Vessel owners or operators must also submit **long-term science-based targets** (net-zero targets) along with their near-term target submission.
- For maritime transport emissions, a long-term science-based target means reducing emissions to a residual level **in line with 1.5°C scenarios** by no later than 2040.

* In addition to the SBTi [general](#) and [Net-Zero](#) criteria.
LIMITATIONS ON FOSSIL FUEL ACTIVITIES

- The SBTi Fossil Fuel Policy affects the extent to which companies engaging in fossil fuel businesses can commit to climate aligned targets.

- Currently the SBTi is unable to accept commitments or validate targets from companies in the oil and gas or fossil fuels sectors.

- Users of the SBTi Maritime Tool with activities related to transportation or extraction of fossil fuel products are advised to review the current status of this policy as well as the latest version of the SBTi Criteria.
MODELLING TARGETS
EXCEL TOOL TO SUPPORT TARGET SETTING FOR THE MARITIME SECTOR

Calculates science-based targets for different vessel types and sizes following the SDA (convergence approach)

One interface for calculating SBTs for all maritime transport categories and one additional (non target setting) feature are included:

**SBT tool**

Vessel operators can model emission reduction targets for freight and passenger maritime transport activities. Shippers and Logistics Service Providers can also use this tool to model emission reduction targets for scope 3 category 4/9 emissions.

**SBT aggregator**

Additional feature to help companies combine targets across multiple maritime transport categories into a single metric.
Section 1. Select type of vessel used for transport activity

Please select vessel type for transport activity

Section 2. Select vessel size category

Please refer to guidance document for details

Section 3. Enter emissions and activity data

Select a base year: 2021
Select a target year: 2033

Well-to-Wake (WTW) emissions in base year: 1,750,000 metric tonnes of CO2 equivalent (tCO2e)
Activity in base year: 168,888,481.121 tonne-nautical mile (tnm)
Expected activity in target year: 236,467,883,369 tonne-nautical mile (tnm)

Option for use when you don't know the vessel size

When don't know breakdown: total emissions across whole portfolio

Based on 40% growth projection over 12 years
TRANSPORT ACTIVITY

- Transport activity: measure of the amount of transport conducted.
  - Calculated by multiplying the amount of goods or number of people by the distance traveled.

- For the purpose of calculating the EEOI, as defined by IMO, this is the actual distance*.
  - This may need to be converted when generating a corporate inventory.

- Amount of goods is quantified in metric tonnes.

- In the SBTi Maritime Tool, distance is quantified in nautical miles.
CALCULATION OF TRANSPORT ACTIVITY

- 20,000 tonnes loaded at Tilbury & transported 1,800 nm to Barcelona.
- 5,000 tonnes unloaded at Barcelona and remaining 15,000 tonnes transported 1,150 nm to Piraeus.
- Total tonne nm = 20,000 \times 1,800 + 15,000 \times 1,150 = 53,250,000
- Always break each journey down into constituent parts for the most accurate results.
CONTAINER SHIPPER: DEFAULT

Section 4. Review target modelling results

Target modelling results - 1.5C

<table>
<thead>
<tr>
<th></th>
<th>Base year 2021</th>
<th>Target year 2033</th>
<th>% Reduction 2021 - 2033</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container Default</td>
<td>1,750,000</td>
<td>643,348</td>
<td>63.2%</td>
</tr>
<tr>
<td>Container Default</td>
<td>10.36</td>
<td>2.72</td>
<td>73.7%</td>
</tr>
</tbody>
</table>

Total emissions respect company share of total GHG budget

Company S curve less steep than industry average as have a better-than-average starting point
**CONTAINER OPERATOR: CATEGORIES**

**Sectoral Decarbonization Approach - Maritime Transport Tool**

**Section 1. Select type of vessel used for transport activity**

- **Container**

**Section 2. Select vessel size category**

- (TEU) 8,000 - 11,999

**Section 3. Enter emissions and activity data**

- Select a base year: **2021**
- Select a target year: **2033**
- Well-to-Wake (WTW) emissions in base year: **171,058** metric tonnes of CO2 equivalent (tCO2e)
- Activity in base year: **10,691,144,708** tonne-nautical mile (tnm)
- Expected activity in target year: **14,967,602,591** tonne-nautical mile (tnm)

Vessel operator will probably have a range of vessel sizes and should have the input data for each vessel category.
CONTAINER OPERATOR: CATEGORIES

Sectoral Decarbonization Approach - Maritime Transport Tool

Section 1. Select type of vessel used for transport activity

Section 2. Select vessel size category

(TEU) >20,000

Section 3. Enter emissions and activity data

Select a base year: 2021 (Any base year between 2013 and the current year is eligible)
Select a target year: 2033 (Near-term targets must cover a maximum of 10 years from the date the target is submitted to the SBTi for validation)

Wet-to-Wake (WtW) emissions in base year: 120,229 metric tonnes CO2 eq.
Activity in base year: 86,393,068,553 tonne-nautical mile (tnm)
Expected activity in target year: 120,950,323,974 tonne-nautical mile (tnm)

Just showing two size categories for the purposes of illustration
CONTAINER OPERATOR: CATEGORIES

Sectoral Decarbonization Approach - Maritime Transport Tool

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OPTIONAL - Target aggregation sheet

Step 1: List the vessel type, size, base year emissions (WTW), activity, and target year activity in columns D, E, G, H and J for each different vessel type or size category for which targets are to be calculated.

Step 2: Calculate the targets for each different vessel type or size category using the "Tool" tab.

Step 3: Input the results calculated in step 2 into columns L through T of the SBTaggregator tab. The aggregated results and prorated reduction target are shown in at the bottom of row of this table. Please note that only intensity targets with the same activity denominators (i.e., unit) can be aggregated.

<table>
<thead>
<tr>
<th>Emissions and activity data (as entered in tool interface)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vessel type</strong></td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

**Combined results**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WTW emissions (tCO₂e)</td>
<td>1,750,000</td>
<td>168,896,488,121</td>
</tr>
<tr>
<td>Activity (Lnm or GTnm)</td>
<td>10.4</td>
<td>236,457,883,369</td>
</tr>
</tbody>
</table>
Company S curve steeper than industry average as have a worse-than-average starting point.
Section 4. Review target modelling results

Target modelling results - 1.5C

<table>
<thead>
<tr>
<th>Container (TEU)</th>
<th>WTW emissions</th>
<th>CO2e</th>
<th>Base year 2021</th>
<th>Target year 2033</th>
<th>% Reduction 2021 - 2033</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;20,000</td>
<td>790,259</td>
<td>308,470</td>
<td>59.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container (TEU)</td>
<td>WTW carbon intensity</td>
<td>gCO2/tn.m</td>
<td>8.80</td>
<td>2.55</td>
<td>71.0%</td>
</tr>
</tbody>
</table>
### Optional - Target aggregation sheet

**Step 1:** List the vessel type, size, base year emissions (WTW), activity, and target year activity in columns D, E, G, H and J for each different vessel type or size category for which targets are to be calculated.

**Step 2:** Calculate the targets for each different vessel type or size category using the “Tool” tab.

**Step 3:** Input the results calculated in step 2 into columns L through T of the SBTAggregator tab. The aggregated results and prorated reduction target are shown in at the bottom of row of this table. Please note that only intensity targets with the same activity denominators (i.e., unit) can be aggregated.

<table>
<thead>
<tr>
<th>Emissions and activity data (as entered in tool interface)</th>
<th>Base year</th>
<th>WTW carbon intensity (gCO2e/t.mm or gCO2e/GT.nm)</th>
<th>Target year</th>
<th>Target modelling results - 1.5C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel type</td>
<td>Vessel size</td>
<td>WTW emissions (tCO2e)</td>
<td>Activity (t.mm or G.T.nm)</td>
<td>WTW carbon intensity (gCO2e/t.mm or gCO2e/GT.nm)</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>----------------------</td>
<td>---------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Container</td>
<td>(TEU) &gt; 20,000</td>
<td>760,259</td>
<td>86,353,068,553</td>
<td>8.80</td>
</tr>
<tr>
<td>Container</td>
<td>(TEU) 14,500 - 19,999</td>
<td>449,028</td>
<td>45,356,371,490</td>
<td>9.90</td>
</tr>
<tr>
<td>Container</td>
<td>(TEU) 12,000 - 14,499</td>
<td>369,064</td>
<td>26,457,883,369</td>
<td>13.97</td>
</tr>
<tr>
<td>Container</td>
<td>(TEU) 8,000 - 11,999</td>
<td>171,058</td>
<td>16,991,144,708</td>
<td>16.00</td>
</tr>
<tr>
<td>Combined results</td>
<td></td>
<td>1,750,000</td>
<td>168,898,488,121</td>
<td>10.4</td>
</tr>
</tbody>
</table>
### CONTAINER OPERATOR: GROWTH

**Sectoral Decarbonization Approach - Maritime Transport Tool**

**Section 1. Select type of vessel used for transport activity**

- **Container**

  Please select vessel type for transport activity

**Section 2. Select vessel size category**

- **(TEU) > 20,000**

  Please refer to guidance document for details

**Section 3. Enter emissions and activity data**

- **Select a base year:** 2021
- **Select a target year:** 2033
- **Well-to-Wake (WTW) emissions in base year:** 760,259 metric tonnes of CO2 equivalent (tCO2e)
- **Activity in base year:** 99,393,099.553 nautical mile (n mi)
- **Expected activity in target year:** 95,032,397.408 nautical mile (n mi)

Based on 10% growth projection over 12 years.
CONTAINER OPERATOR: HIGH GROWTH

Repeat of 40% growth example used previously

Section 4. Review target modelling results

<table>
<thead>
<tr>
<th>Container (TEU) &gt;20,000</th>
<th>WTW emissions</th>
<th>TC02e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year 2021</td>
<td>760,259</td>
<td></td>
</tr>
<tr>
<td>Target year 2033</td>
<td>306,470</td>
<td></td>
</tr>
<tr>
<td>% Reduction 2021-2033</td>
<td>59.4%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Container (TEU) &gt;20,000</th>
<th>WTW carbon intensity gCO2e/t km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year 2021</td>
<td>8.80</td>
</tr>
<tr>
<td>Target year 2033</td>
<td>2.55</td>
</tr>
<tr>
<td>% Reduction 2021-2033</td>
<td>71.0%</td>
</tr>
</tbody>
</table>

Graphs showing target modelling results - 1.5°C
CONTAINER OPERATOR: LOW GROWTH

Section 4. Review target modelling results

Target modelling results - 1.5C

<table>
<thead>
<tr>
<th>Container (TEU) &gt; 20,000</th>
<th>WTW emissions</th>
<th>tCO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year 2021</td>
<td>700,259</td>
<td></td>
</tr>
<tr>
<td>Target year 2033</td>
<td>251,725</td>
<td></td>
</tr>
<tr>
<td>% Reduction 2021-2033</td>
<td>66.9%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Container (TEU) &gt; 20,000</th>
<th>WTW carbon intensity</th>
<th>gCO2e/t nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year 2021</td>
<td>8.80</td>
<td></td>
</tr>
<tr>
<td>Target year 2033</td>
<td>2.65</td>
<td></td>
</tr>
<tr>
<td>% Reduction 2021-2033</td>
<td>69.9%</td>
<td></td>
</tr>
</tbody>
</table>

Company S curve slightly less steep in this low growth situation

Easier to respect company share of GHG budget
Section 1. Select type of vessel used for transport activity

Chemical Tanker

Section 2. Select vessel size category

(DWT) 20,000 - 39,999

Section 3. Enter emissions and activity data

Select a base year: 2022
Select a target year: 2030
Well-to-Wake (WTW) emissions in base year: 200,000 metric tonnes of CO2 equivalent (tCO2e)
Activity in base year: 8,338,308,855 t-nm
Expected activity in target year: 8,338,308,855 t-nm

Based on no growth over 12 years
# CHEMICAL TANKER

## Section 4. Review target modelling results

### Target modelling results - 1.5C

<table>
<thead>
<tr>
<th>Model</th>
<th>Category</th>
<th>Key Metric</th>
<th>Unit</th>
<th>Base year 2022</th>
<th>Target year 2030</th>
<th>% Reduction 2022 - 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Tanker (DWT) 20,000 - 39,999</td>
<td>WTW emissions</td>
<td>tCO2e</td>
<td></td>
<td>200,000</td>
<td>112,055</td>
<td>44.0%</td>
</tr>
<tr>
<td>Chemical Tanker (DWT) 20,000 - 39,999</td>
<td>WTW carbon intensity</td>
<td>gCO2e/t nm</td>
<td></td>
<td>23.15</td>
<td>12.97</td>
<td>44.0%</td>
</tr>
</tbody>
</table>

Lots of work to do to catch up with industry average.
CHEMICAL TANKER: HIGH GROWTH

Change to 40% growth example

Section 4. Review target modelling results

Target modelling results - 1.5C

<table>
<thead>
<tr>
<th>Chemical Tanker (DWT) 20,000 - 39,999</th>
<th>WTW emissions</th>
<th>tCO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td>137,317</td>
<td>31.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Tanker (DWT) 20,000 - 39,999</th>
<th>WTW carbon intensity</th>
<th>gCO2/t nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>23.15</td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td>11.35</td>
<td>51.0%</td>
</tr>
</tbody>
</table>

Becomes harder to catch up with industry average

Fills the company share of GHG budget
**FERRY OPERATOR**

**Sectoral Decarbonization Approach - Maritime Transport Tool**

**Section 1. Select type of vessel used for transport activity**

| Ferry Passenger Only | Please select vessel type for transport activity |

**Section 2. Select vessel size category**

| (GT) 1,000 - 1,999 | Please refer to guidance document for details |

**Section 3. Enter emissions and activity data**

| Select a base year | 2022 |
| Select a target year | 2033 |
| Well-to-Wake (WTW) emissions in base year | 100,000 metric tonnes of CO2 equivalent (tCO2e) |
| Activity in base year | 1,000,000,000 gross tonne nautical miles (GTnm) |
| Expected activity in target year | 1,300,000,000 |

Based on 30% growth over 12 years
Company share of GHG budget already constrained
FERRY OPERATOR

Change to 40% growth example

Section 4. Review target modelling results

<table>
<thead>
<tr>
<th>Target modelling results - 1.5C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferry Passenger Only (GT) 1,000 - 1,999</td>
</tr>
<tr>
<td>Base year 2022</td>
</tr>
<tr>
<td>100,000</td>
</tr>
<tr>
<td>Ferry Passenger Only (GT) 1,000 - 1,999</td>
</tr>
<tr>
<td>100.00</td>
</tr>
</tbody>
</table>

Becomes harder to catch up with industry average
TARGET FORMULATION

Targets may be expressed either as absolute emissions (tonnes CO\textsubscript{2}e) or on an intensity basis (e.g., gCO\textsubscript{2}e per tonne nautical mile).

*Vessel Operator commits to reduce Well-to-Wake GHG emissions 69% per tonne nautical mile from ferry operations by 2033 from a 2021 base year.*

- SBTi Bioenergy footnote may be applicable.
- Target recalculation is needed in the event of changes to the company structure or its operations. (e.g., mergers & acquisitions, updates to growth projections, base year data/assumptions).
THE TIME TO ACT IS NOW!

- We are urgently calling on all companies to set science-based net-zero targets.
- Join our mailing list to receive updates.
- Should you have any questions, contact us at info@sciencebasedtargets.org.
- The new guidance and materials, as well as the recording of this webinar can be found on the SBTi maritime webpage.