ClassNK Fleet Cost Calculator

https://www.classnk.or.jp/hp/en/info_service/ghg/

User Manual

Version 1.0 (July 2025)

Table of Contents

Calculation Process

Data Input

Input the fleet and fuel data
required to perform the estimation.

Assumption Settings

Set the calculation parameters,
such as fuel prices.

Calculation & Graph Output

Costs are automatically calculated,
and the results are displayed as graphs.

Note

Some functions of the calculator are available only in newer versions of excel such as Excel 2021 and Microsoft 365. Please note that the calculator may not work properly depending on your version of excel.

The calculator uses macros for some of its functions, so please enable macros before using the calculator for the first time.

Overall Structure

The ClassNK Fleet Cost Calculator consists of 56 sheets, which are categorized into 11 groups.

◆**Table of contents**

This group contains the sheet for the table of contents.

◆**Input**

This group contains the sheet for inputting fleet data and fuel consumption data.

◆**Result**

This group contains the sheet for displaying the calculation results, including graphs.

◆**For making dashboard**

This group contains the sheets for the data necessary for generating the graphs.

◆**Assumptions**

This group contains the sheets for assumptions.

◆**Shipbuilding**

This group contains the sheets for shipbuilding costs.

◆**Fuel**

This group contains the sheets for fuel costs.

◆**IMO GFI**

This group contains the sheets for IMO GFI costs.

◆**EU-ETS**

This group contains the sheets for EU-ETS costs.

◆**FuelEU Maritime**

This group contains the sheets for FuelEU Maritime costs.

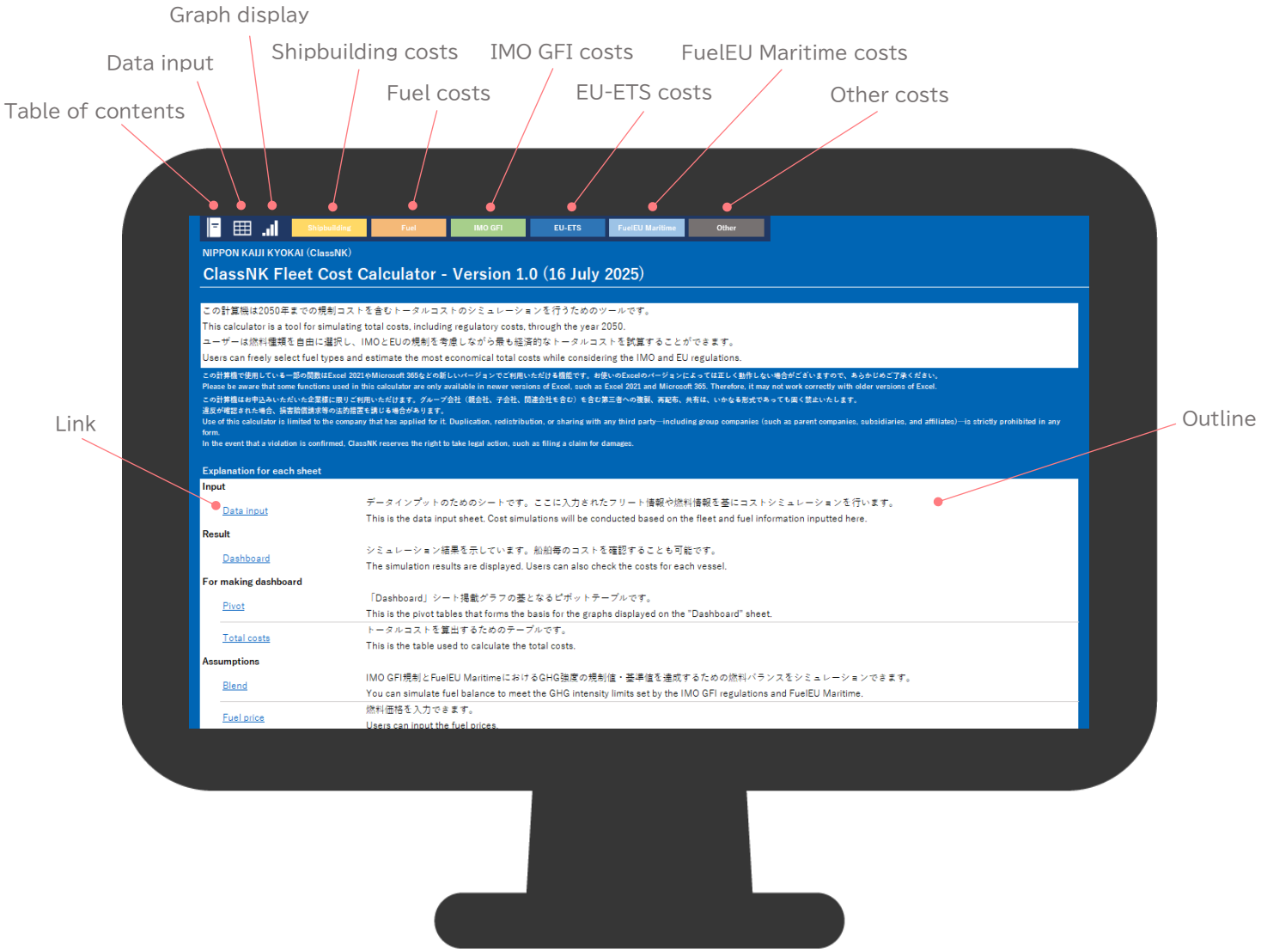
◆**Data**

This group contains the sheets for the information required for the calculator’ s operation and calculations.

An overview of each sheet is provided on the following pages.

“Table of contents” sheet

You can view an overview of each sheet.



Tips & Tricks

Click the links to quickly navigate to each sheet.

You can return to the “Table of contents” sheet from any other sheet.

Tips & Tricks

Master the calculator by learning the meaning of its color-coded text.

Note	
Written in black	関数なし Function not used
Written in blue	関数あり Function used
Written in red	ClassNKによる想定 Assumption by ClassNK

“Data input” sheet

Input the information for the vessels you want to include in the cost calculation.

ClassNK Fleet Cost Calculator

Data input

No effect on the cost simulation.
Input field

Fleet information ->

No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	GT	DWT	TEU	CBM	Cars
1	1000001	KAIJI MARU 01	2025	2050	Bulk carrier	36,000	64,000			
2	1000002	KAIJI MARU 02	2025	2050	Containership	130,000	150,000	14,000		
3	1000003	KAIJI MARU 03	2025	2050	Crude oil tanker	150,000	300,000			
4	1000004	KAIJI MARU 04	2025	2050	Product/Chemical tanker	30,000	50,000			
5	1000005	KAIJI MARU 05	2025	2050	LPG carrier	53,000	60,000		100,000	
6	1000006	KAIJI MARU 06	2025	2050	LNG carrier	110,000	100,000		170,000	
7	1000007	KAIJI MARU 07	2025	2050	Vehicle carrier	80,000	30,000			9,000

Year built
(The cost calculation starts from this year.)

Year scrapped
(The cost calculation ends with this year.)

There is no impact on the cost calculation.
(Reference)

Tips & Tricks

When considering a replacement (fuel conversion) for a specific vessel, try inputting the data for the same vessel twice for a comparison.

(for LNG-fueled vessel)
Main engine’s combustion method

Alternative fuel ship’s price
(Reference)

Ship’s residual value
(This forms the basis of the shipbuilding costs.)

Ship price’s
remaining payment period

Conventional ship’s price
(Reference)

Main engine

		Ship price ->			
ME	ME (for LNG)	Ref. ship price	Ref. ship price (DF)	Ship's residual value	Remaining payment period
Fuel_oil		USD 35,000,000	USD 35,000,000	USD 35,000,000	8 years
LNG	(Otto dual fuel slow speed)	USD 140,000,000	USD 182,000,000	USD 160,000,000	10 years
Ammonia		USD 125,000,000	USD 162,500,000	USD 150,000,000	12 years
Methanol		USD 50,000,000	USD 60,000,000	USD 40,000,000	8 years
LPG		USD 95,000,000	USD 123,500,000	USD 100,000,000	10 years
LNG	(Diesel dual fuel slow speed)	USD 200,000,000	USD 260,000,000	USD 200,000,000	10 years
Hydrogen		USD 95,000,000	USD 190,000,000	USD 190,000,000	12 years

Tips & Tricks

You can exclude shipbuilding costs from the result, but let’s start by inputting the data.

Note

Please ensure that the “Remaining payment period” does not exceed the vessel’s useful life (the period from the year built to the year scrapped).

Select the vessel for which you want to check the costs.

You can check the annual costs.

(Please also refer to the costs per tonne of fuel.)

Select ships											
KAIJI MARU 01											
Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Shipbuilding costs	4,375,000	4,375,000	4,375,000	4,375,000	4,375,000	4,375,000	4,375,000	4,375,000	0	0	0
Fuel costs	2,412,000	2,412,000	2,412,000	3,993,446	4,053,347	7,695,978	8,080,777	8,484,816	8,909,056	9,354,509	9,822,235
IMO GFI (Tier 1) costs	0	0	0	0	6,997	0	0	0	0	0	0
IMO GFI (Tier 2) costs	0	0	0	(76,274)	0	(2,592,252)	(2,385,966)	(2,179,680)	(1,973,393)	(1,767,107)	(1,560,821)
IMO GFI (Reward) costs	0	0	0	0	0	0	0	0	0	0	0
EU-ETS costs	87,074	126,879	129,417	97,963	99,922	2,267	2,312	2,359	2,406	2,454	2,503
FuelEU Maritime costs	34,949	38,444	41,939	(84,934)	(84,934)	(315,385)	(315,385)	(315,385)	(315,385)	(315,385)	(280,125)
Other costs	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Total costs	7,909,023	7,952,323	7,958,356	9,305,200	9,450,333	10,165,607	10,756,738	11,367,109	7,622,683	8,274,471	8,983,792
Total costs (/t HFOeq)	1,582	1,590	1,592	1,861	1,890	2,033	2,151	2,273	1,525	1,655	1,797
Regulatory costs (/t HFOeq)	24	33	34	(13)	4	(581)	(540)	(499)	(457)	(416)	(368)

Fuel select ->	2025										
FC (HFO base)	Energy share	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
5,000 t	5.6%	HFO	HFO	HFO	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B100)	Biodiesel (B100)	Biodiesel (B100)	Biodiesel (B100)	Biodiesel (B100)	Biodiesel (B100)
20,000 t	22.2%	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	bio-methane
15,000 t	16.7%	HFO	HFO	HFO	HFO	HFO	e-ammonia	e-ammonia	e-ammonia	e-ammonia	e-ammonia	e-ammonia
5,000 t	5.6%	HFO	HFO	HFO	HFO	HFO	bio-methanol	bio-methanol	bio-methanol	bio-methanol	bio-methanol	bio-methanol
10,000 t	11.1%	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)	LPG (Propane)
25,000 t	27.8%	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	LNG	bio-methane
10,000 t	11.1%	HFO	HFO	HFO	HFO	HFO	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen

Annual fuel consumption (HFO base)

The vessel's share of the fleet's total energy consumption

Type of fuel used (Main fuel)

Tips & Tricks

Vessels with high energy consumption (fuel consumption) have the most significant impact on the fleet's total regulatory costs. Therefore, we recommend using the "Energy share" data to prioritize evaluating fuel conversion for these vessels first.

FAQ

Q. For a dual-fuel vessel, can the regulatory costs be calculated accurately if I provide the annual consumption on an HFO-equivalent basis?

A. Yes, that will work fine. The calculator calculates all costs by converting the HFO-based consumption figure into an equivalent energy consumption value. As such, consumption data for alternative fuels is not required.

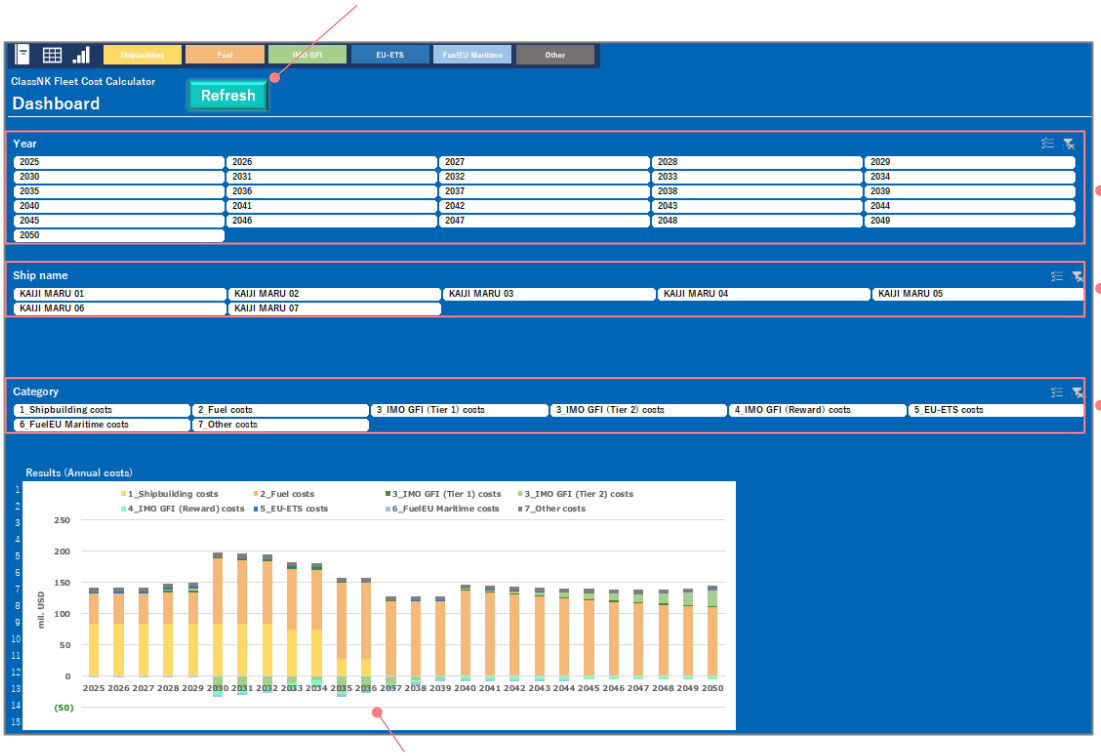
“Dashboard” sheet

You can calculate the total cost for the entire fleet and display the results as a graph.

Data update

(After changing any inputs such as fleet data, fuel types, or assumptions, please be sure to click to update the data.)

(Please note that the update process may take approximately 20 seconds.)



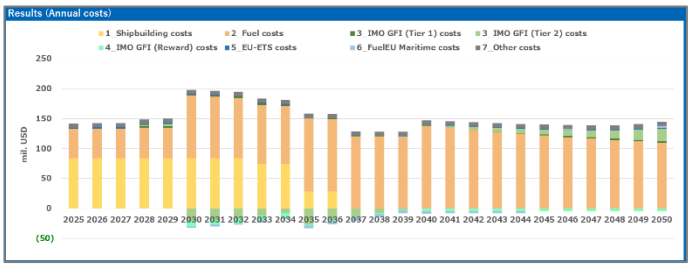
Selecting a year to display

Selecting a vessel to display

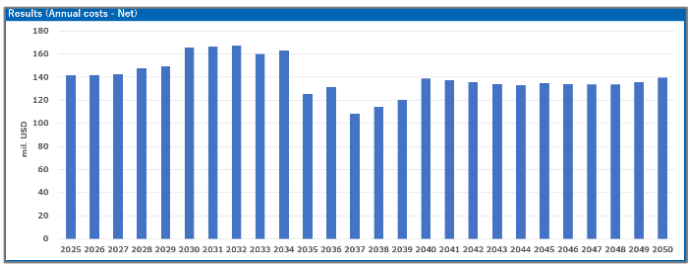
Selecting a cost to display

Estimation result

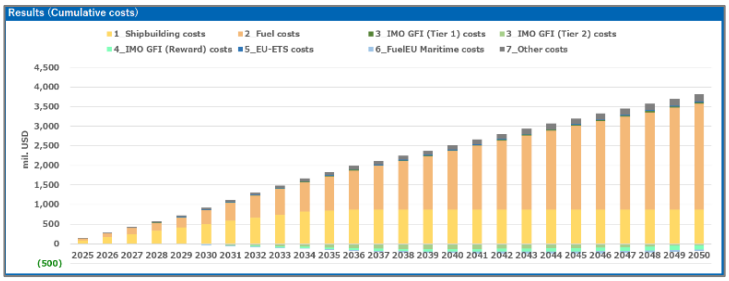
◆Total costs (Annual costs)



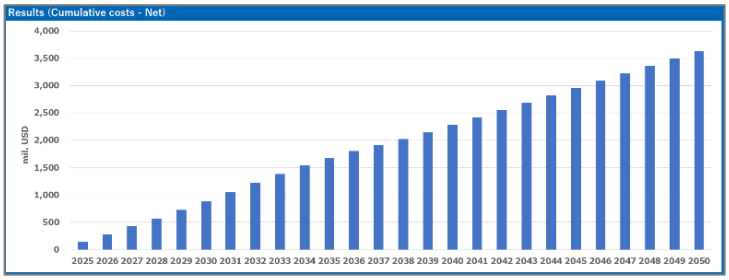
◆Total costs (Annual costs - Net)



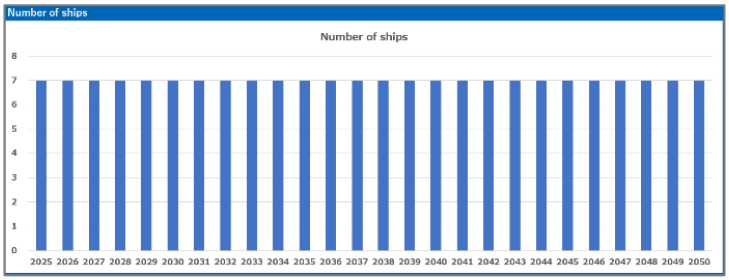
◆Total costs（Cumulative costs）



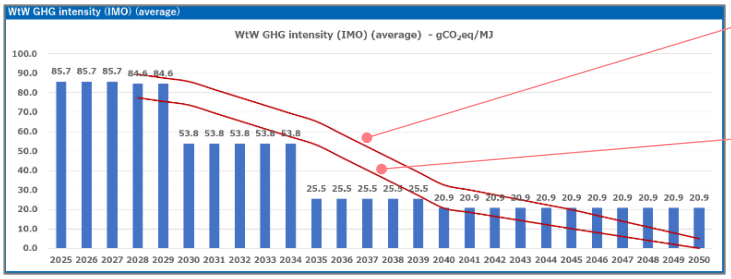
◆Total costs（Cumulative costs - Net）



◆Number of ships



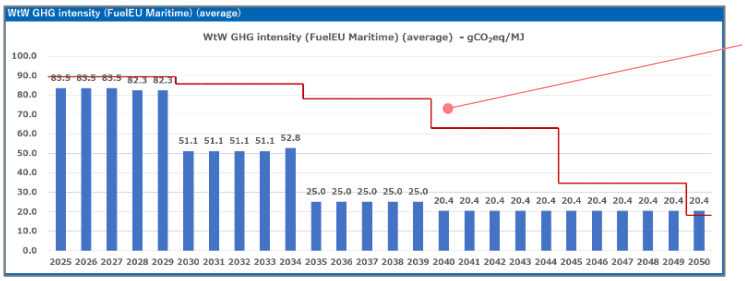
◆Fleet GHG intensity（IMO GFI）



Base target
(including ClassNK' s assumptions)

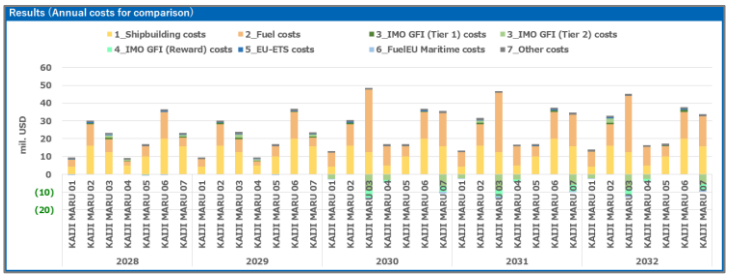
Direct compliance target
(including ClassNK' s assumptions)

◆Fleet GHG intensity（FuelEU Maritime）

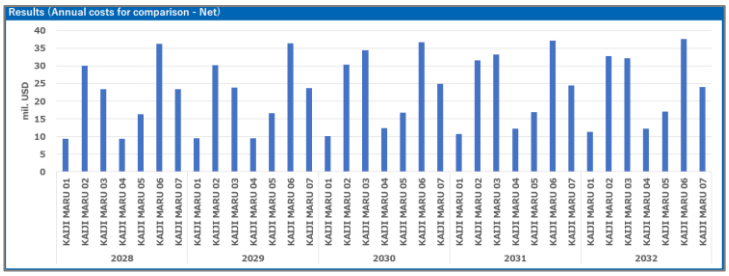


Limit

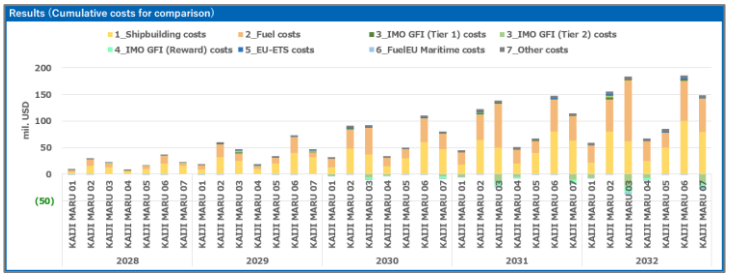
◆Total costs comparison（Annual costs）



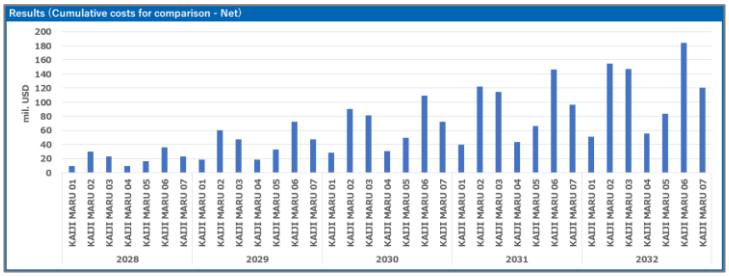
◆Total costs comparison（Annual costs - Net）



◆Total costs comparison（Cumulative costs）



◆Total costs comparison（Cumulative costs - Net）



Tips & Tricks

Here’s a useful tip for analyzing a fuel conversion: Input the same vessel twice—once with its current fuel and once with the new fuel—to create a side-by-side comparison.

“Pivot” sheet

This sheet contains the pivot tables that serve as the data source for the graphs on the “Dashboard” sheet. When you click “Refresh” on the “Dashboard” sheet, this “Pivot” sheet will also be updated.

Tips & Tricks

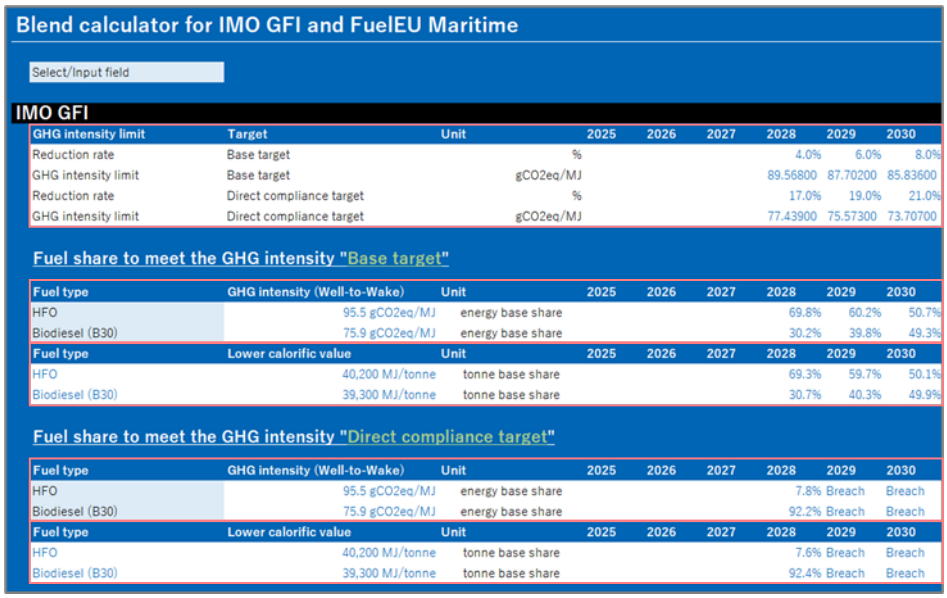
By adding new pivot tables, you can perform analyses that are more tailored to your company’s specific needs.

“Total costs” sheet

This sheet is used to generate the source data for the graphs on the “Dashboard” sheet. When you click “Refresh” on the “Dashboard” sheet, this “Total costs” sheet will also be updated.

“Blend” sheet

You can check the required fuel mix to meet the annual GHG intensity base target and direct compliance target, as well as the indicative fuel prices needed to achieve that mix.



Blend calculator for IMO GFI and FuelEU Maritime

Select/Input field

IMO GFI

GHG intensity limit	Target	Unit	2025	2026	2027	2028	2029	2030
Reduction rate	Base target	%				4.0%	6.0%	8.0%
GHG intensity limit	Base target	gCO2eq/MJ				89.56800	87.70200	85.83600
Reduction rate	Direct compliance target	%				17.0%	19.0%	21.0%
GHG intensity limit	Direct compliance target	gCO2eq/MJ				77.43900	75.57300	73.70700

Fuel share to meet the GHG intensity "Base target"

Fuel type	GHG intensity (Well-to-Wake)	Unit	2025	2026	2027	2028	2029	2030
HFO	95.5 gCO2eq/MJ	energy base share				69.8%	60.2%	50.7%
Biodiesel (B30)	75.9 gCO2eq/MJ	energy base share				30.2%	39.8%	49.3%

Fuel type	Lower calorific value	Unit	2025	2026	2027	2028	2029	2030
HFO	40,200 MJ/tonne	tonne base share				69.3%	59.7%	50.1%
Biodiesel (B30)	39,300 MJ/tonne	tonne base share				30.7%	40.3%	49.9%

Fuel share to meet the GHG intensity "Direct compliance target"

Fuel type	GHG intensity (Well-to-Wake)	Unit	2025	2026	2027	2028	2029	2030
HFO	95.5 gCO2eq/MJ	energy base share				7.8%	Breach	Breach
Biodiesel (B30)	75.9 gCO2eq/MJ	energy base share				92.2%	Breach	Breach

Fuel type	Lower calorific value	Unit	2025	2026	2027	2028	2029	2030
HFO	40,200 MJ/tonne	tonne base share				7.6%	Breach	Breach
Biodiesel (B30)	39,300 MJ/tonne	tonne base share				92.4%	Breach	Breach

IMO GFI’s annual base target and direct compliance target

Fuel share to meet the annual base target

(Energy base)

Fuel share to meet the annual base target

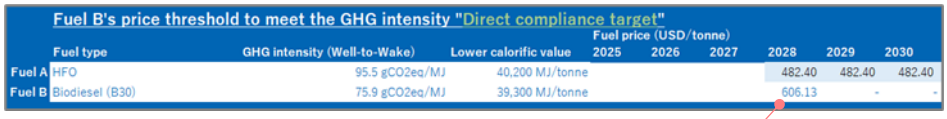
(Fuel tonne base of each fuel type)

Fuel share to meet the annual direct compliance target

(Energy base)

Fuel share to meet the annual direct compliance target

(Fuel tonne base of each fuel type)



Fuel B's price threshold to meet the GHG intensity "Direct compliance target"

	Fuel type	GHG intensity (Well-to-Wake)	Lower calorific value	Fuel price (USD/tonne) 2025	2026	2027	2028	2029	2030
Fuel A	HFO	95.5 gCO2eq/MJ	40,200 MJ/tonne				482.40	482.40	482.40
Fuel B	Biodiesel (B30)	75.9 gCO2eq/MJ	39,300 MJ/tonne				606.13	-	-

Upper price limit for Fuel B for regulatory compliance when using Fuel A and Fuel B

(If the price of Fuel B exceeds this value, it is more cost-effective to use only Fuel A and pay the associated penalty.)

A similar feature is also available for the FuelEU Maritime.

Tips & Tricks

Sourcing low-carbon fuels in substantial volumes is challenging. Therefore, the first step is to understand the fuel mix required to meet the annual GHG intensity base target and direct compliance target, and then plan your fuel procurement strategically.

“Fuel price” sheet

You can set fuel prices for the period up to 2050.

Input field

Fuel price

table_Fuel_price_MJ

Fuel type	Unit	Ref. price	Decline rate	2025	2026	2027	2028	2029	2030	2031	2032	20
HFO	USD/GJ		0.0%									
LFO	USD/GJ		0.0%									
MDO/MGO	USD/GJ		0.0%									
Biodiesel (B24)	USD/GJ		-1.2%									
Biodiesel (B30)	USD/GJ		-1.5%									
Biodiesel (B100)	USD/GJ		-5.0%									
LNG	USD/GJ		0.0%									
bio-methane	USD/GJ		-2.0%									
e-methane	USD/GJ		3.0%									
Gray methanol	USD/GJ		0.0%									
bio-methanol	USD/GJ		2.0%									
e-methanol	USD/GJ		3.0%									
Gray ammonia	USD/GJ		0.0%									
e-ammonia	USD/GJ		5.0%									
LPG (Propane)	USD/GJ		0.0%									
LPG (Butane)	USD/GJ		0.0%									
bio-LPG	USD/GJ		2.0%									
e-LPG	USD/GJ		3.0%									
Gray hydrogen	USD/GJ		0.0%									
e-hydrogen	USD/GJ		5.0%									

You can set the annual percentage change for fuel prices.

You can also view fuel prices on a per-tonne basis.

table_Fuel_price_t

Fuel type	Unit	Ref. price	Decline rate	2025	2026	2027	2028	2029	2030	2031	2032	20
HFO	USD/t		0.0%									
LFO	USD/t		0.0%									
MDO/MGO	USD/t		0.0%									
Biodiesel (B24)	USD/t		-1.2%									
Biodiesel (B30)	USD/t		-1.5%									
Biodiesel (B100)	USD/t		-5.0%									
LNG	USD/t		0.0%									
bio-methane	USD/t		-2.0%									
e-methane	USD/t		3.0%									
Gray methanol	USD/t		0.0%									
bio-methanol	USD/t		2.0%									
e-methanol	USD/t		3.0%									
Gray ammonia	USD/t		0.0%									
e-ammonia	USD/t		5.0%									
LPG (Propane)	USD/t		0.0%									
LPG (Butane)	USD/t		0.0%									
bio-LPG	USD/t		2.0%									
e-LPG	USD/t		3.0%									
Gray hydrogen	USD/t		0.0%									
e-hydrogen	USD/t		5.0%									

“2nd fuel type” sheet

You can set a 2nd fuel type.

Input field

Second fuel type

table_Second_fuel_type

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type	Main engine for LNG (Otto dual fuel slow speed)	Fuel consumption (HFO base)	2025	2026	2027	2028	2029	2030
Second fuel type	0.8437	1	1000001	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	0	5,000 t	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)
Second fuel type	0.6643	2	1000002	KAIJI MARU 02	2025	2050	Containership	LNG	(Otto dual fuel slow speed)	20,000 t	MDO/MGO	MDO/MGO	MDO/MGO	MDO/MGO	MDO/MGO	MDO/MGO
Second fuel type	0.1648	3	1000003	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	0	15,000 t	e-ammonia	e-ammonia	e-ammonia	e-ammonia	e-ammonia	e-ammonia
Second fuel type	0.5023	4	1000004	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	0	5,000 t	bio-methanol	bio-methanol	bio-methanol	bio-methanol	bio-methanol	bio-methanol
Second fuel type	0.2541	5	1000005	KAIJI MARU 05	2025	2050	LPG carrier	LPG	0	10,000 t	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)	Biodiesel (B30)
Second fuel type	0.4986	6	1000006	KAIJI MARU 06	2025	2050	LNG carrier	LNG	(Diesel dual fuel slow speed)	25,000 t	bio-methane	bio-methane	bio-methane	bio-methane	bio-methane	bio-methane
Second fuel type	0.8434	7	1000007	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	0	10,000 t	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen	e-hydrogen

Tips & Tricks

For dual-fuel vessels, you can simulate a more realistic operational scenario by selecting the main alternative fuel on the “Data input” sheet and the pilot fuel on this “2nd fuel type” sheet. Furthermore, feel free to experiment with various combinations, such as LNG and bio-methane.

“2nd fuel ratio” sheet

You can set the annual usage percentage for the 2nd fuel type.

Input field

Second fuel ratio

table_Second_fuel_ratio

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type	Fuel consumption (MT/1 hour)	Unit		2025	2026	2027	2028	2029	2030
Second fuel ratio	0.7675	1	9999999	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	5,000	t	%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Second fuel ratio	0.7755	2	9999999	KAIJI MARU 02	2025	2050	Containership	LNG	20,000	t	%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Second fuel ratio	0.2059	3	9999999	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	15,000	t	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Second fuel ratio	0.6249	4	9999999	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	5,000	t	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Second fuel ratio	0.1246	5	9999999	KAIJI MARU 05	2025	2050	LPG carrier	LPG	10,000	t	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Second fuel ratio	0.8624	6	9999999	KAIJI MARU 06	2025	2050	LNG carrier	LNG	25,000	t	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Second fuel ratio	0.5147	7	9999999	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	10,000	t	%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

For dual-fuel vessels that require pilot fuel, the cell is displayed in red to prevent input omissions.

Tips & Tricks

First, check the required fuel share for annual GHG intensity compliance on the “Blend” sheet. Then, try setting the usage percentage on this “2nd fuel ratio” sheet accordingly.

“EE” sheet

You can set the year-on-year (YoY) energy efficiency improvement rate.

Input field

Energy efficiency

table_Energy_efficiency

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type	Fuel consumption (MT/Diem)	Unit	2025	2026	2027	2028	2029	2030
Energy_efficiency	0.8341	1	9999999	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	5,000 t	%	-	1.0%	1.0%	1.0%	1.0%	1.0%
Energy_efficiency	0.1722	2	9999999	KAIJI MARU 02	2025	2050	Containership	LNG	20,000 t	%	-	0.0%	0.0%	5.0%	0.0%	0.0%
Energy_efficiency	0.6987	3	9999999	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	15,000 t	%	-	0.0%	0.0%	0.0%	0.0%	0.0%
Energy_efficiency	0.7728	4	9999999	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	5,000 t	%	-	0.0%	0.0%	0.0%	0.0%	0.0%
Energy_efficiency	0.8577	5	9999999	KAIJI MARU 05	2025	2050	LPG carrier	LPG	10,000 t	%	-	0.0%	0.0%	0.0%	0.0%	0.0%
Energy_efficiency	0.9003	6	9999999	KAIJI MARU 06	2025	2050	LNG carrier	LNG	25,000 t	%	-	0.0%	0.0%	0.0%	0.0%	0.0%
Energy_efficiency	0.3410	7	9999999	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	10,000 t	%	-	0.0%	0.0%	0.0%	0.0%	0.0%

Tips & Tricks

If you are planning to operate reduced speeds (slow steaming), please input the expected energy efficiency improvement rate from that measure.

Similarly, if you are planning to install (retrofit) energy-saving technologies such as wind-assisted propulsion systems, please input the anticipated improvement rate resulting from the retrofit.

“GHG intensity limit (IMO)” sheet

You can set the annual GHG intensity targets (base target and direct compliance target) required by the IMO GFI regulations.

Input field

WtW GHG intensity limit (IMO GFI)

table_WtW_GHG_intensity_limit_IMO_GFI

GHG intensity limit	Target	Unit	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Reduction rate	Base target	%	4.0%	6.0%	8.0%	12.4%	16.8%	21.2%	25.6%	30.0%	37.0%	44.0%	51.0%	58.0%	65.0%
GHG intensity limit	Base target	gCO2eq/MJ	89.56800	87.70200	85.83600	81.73080	77.62560	73.52040	69.41520	65.31000	58.77900	52.24800	45.71700	39.18600	32.65500
Reduction rate	Direct compliance target	%	17.0%	19.0%	21.0%	25.4%	29.8%	34.2%	38.6%	43.0%	50.0%	57.0%	63.9%	70.9%	77.9%
GHG intensity limit	Direct compliance target	gCO2eq/MJ	77.43900	75.57300	73.70700	69.60180	65.49660	61.39140	57.28620	53.18100	46.66866	40.15632	33.64398	27.13164	20.61930

Tips & Tricks

Once the regulatory targets for GHG intensity are finalized, you can set those values on this “GHG intensity limit (IMO)” sheet to quickly assess the impact of the regulations.

“Contributions (IMO)” sheet

You can set the unit price of contributions and the sale price of surplus units for the IMO’s GFI regulations.

Input field

WtW GHG contribution price (IMO GFI)															
table_WtW_GHG_contribution_price_IMO_GFI															
GHG contribution price	**Target**	**Unit**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
GHG contribution price	Base Target	USD/tCO2eq	380	380	380	380	380	380	380	380	380	380	380	380	380
GHG contribution price	Direct Compliance Target	USD/tCO2eq	100	100	100	100	100	100	100	100	100	100	100	100	100
Surplus unit price	-	USD/tCO2eq	250	250	250	250	250	250	250	250	250	250	250	250	250

Tips & Tricks

Once the unit price of the contribution is finalized, you can set that value on the “Contributions (IMO)” sheet to quickly assess the financial impact of the regulations.

“Reward threshold (IMO)” sheet

You can set the GHG intensity threshold to be eligible for a “Reward” under the IMO’s GFI regulations.

Input field

Reward threshold (IMO GFI)

table_Reward_threshold_IMO_GFI

Reward threshold	Unit	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Reward threshold	gCO2eq/MJ	19	19	19	19	19	19	19	14	14	14	14	14	14

Tips & Tricks

If the threshold is changed, you can update the value on this “Reward threshold (IMO)” sheet to quickly assess the regulation’s impact.

“Reward price (IMO)” sheet

You can set the “Reward” price unit under the IMO’s GFI regulations.

Input field

Reward price (IMO GFI)

table_Reward_price_IMO_GFI

Unit	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
USD/tonCO2eq	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Tips & Tricks

Once the “Reward” unit price is finalized, you can set that value on this “Reward price (IMO)” sheet to quickly assess the regulation’s impact.

Please note: As of July 2025, the methodology for calculating “Reward” under the IMO’s GFI regulations has not yet been finalized, but in the calculator (Version 1.0), the “Reward” is calculated using the following formula:

(GHG Intensity Threshold for ’Reward’ [gCO_2eq/MJ] - GHG Intensity of the Reward-Eligible Fuel [gCO_2eq/MJ])

× Energy Consumption of the Reward-Eligible Fuel [MJ]

/ 1,000,000 (conversion from grams to tons)

× ’Reward’ price unit [$USD/tonCO_2eq$]

“EU ratio” sheet

You can set the percentage of annual energy consumption that is subject to EU regulations (i.e., EU-ETS and FuelEU Maritime).

Input field

EU ratio (EU-ETS)(FuelEU Maritime)

table_EU_ratio

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type	[illegible]	Unit	2025	2026	2027	2028	2029	2030
EU ratio	0.4274	1	9999999	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	5,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.1542	2	9999999	KAIJI MARU 02	2025	2050	Containership	LNG	20,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.7629	3	9999999	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	15,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.3332	4	9999999	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	5,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.0717	5	9999999	KAIJI MARU 05	2025	2050	LPG carrier	LPG	10,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.5204	6	9999999	KAIJI MARU 06	2025	2050	LNG carrier	LNG	25,000 t	%	10%	10%	10%	10%	10%	10%
EU ratio	0.1651	7	9999999	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	10,000 t	%	10%	10%	10%	10%	10%	10%

Note

Please input the final percentage of energy consumption that is subject to EU regulations, after factoring in the specific rules for “at berth in EU ports”, “intra-EU voyages”, and “voyages between EU and non-EU ports.” Note that this is not simply the percentage of your EU-related voyages.

“EUA price” sheet

You can set the price per EU Allowance (EUA).

Input field

EUA price

table_EUA_price

Unit	Annual rate of increase	2025	2026	2027	2028	2029	2030
EUR/tCO2eq	2.0%	70.0	71.4	72.8	74.3	75.8	77.3
USD/tCO2eq	2.0%	78.7	80.2	81.8	83.5	85.1	86.8

Annual increase rate for the EUA price

EUA price for 2025

“Compliance surplus (FuelEU)” sheet

You can set the sale price of compliance surplus units under the FuelEU Maritime.

Input field																	
WtW GHG compliance surplus price (FuelEU Maritime)																	
table_WtW_GHG_compliance_surplus_price_FuelEUMaritime																	
GHG contribution price	**Unit**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Surplus unit price	EUR/tCO2eq	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200

“WAPS (FuelEU)” sheet

You can set the reward factor for the GHG intensity reduction achieved by installing wind-assisted propulsion systems under the FuelEU Maritime.

Input field

Reward factor for wind-assisted propulsion systems (FuelEU Maritime)

table_Reward_factor_for_wind-assisted_propulsion_systems_FuelEUMaritime

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type		Unit	2025	2026	2027	2028	2029	2030
	0.3935	1	9999999	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	5,000 t	%	0%	0%	0%	1%	0%	0%
	0.0136	2	9999999	KAIJI MARU 02	2025	2050	Containership	LNG	20,000 t	%	0%	0%	0%	3%	0%	0%
	0.0868	3	9999999	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	15,000 t	%	0%	0%	0%	5%	0%	0%
	0.4206	4	9999999	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	5,000 t	%	0%	0%	0%	0%	0%	0%
	0.5413	5	9999999	KAIJI MARU 05	2025	2050	LPG carrier	LPG	10,000 t	%	0%	0%	0%	0%	0%	0%
	0.1733	6	9999999	KAIJI MARU 06	2025	2050	LNG carrier	LNG	25,000 t	%	0%	0%	0%	0%	0%	0%
	0.8398	7	9999999	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	10,000 t	%	0%	0%	0%	0%	0%	0%

Reward factor (1% or 3% or 5%)

“Exchange rate” sheet

You can set the EUR-USD exchange rate.

Input field																
Exchange rate																
table_Exchange_rate																
Unit	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
EUR/USD	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89

Note

The prices for EUA and penalties under FuelEU Maritime are denominated in Euro (EUR). As our calculator calculates costs in US Dollars (USD), the exchange rate you set on this “Exchange rate” sheet will be applied to the EUR-to-USD conversion.

“Other costs” sheet

You can set other costs.

Input field

Other costs

table_Other_costs

Category	ID	No.	IMO No.	Ship name	Year built	Year scrapped	Ship type	Main engine fuel type		Unit	2025	2026	2027	2028	2029	2030
6_Other costs	0.1119	1	9999999	KAIJI MARU 01	2025	2050	Bulk carrier	Fuel_oil	5,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.4479	2	9999999	KAIJI MARU 02	2025	2050	Containership	LNG	20,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.4336	3	9999999	KAIJI MARU 03	2025	2050	Crude oil tanker	Ammonia	15,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.3190	4	9999999	KAIJI MARU 04	2025	2050	Product/Chemical tanker	Methanol	5,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.0224	5	9999999	KAIJI MARU 05	2025	2050	LPG carrier	LPG	10,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.5831	6	9999999	KAIJI MARU 06	2025	2050	LNG carrier	LNG	25,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
6_Other costs	0.7725	7	9999999	KAIJI MARU 07	2025	2050	Vehicle carrier	Hydrogen	10,000 t	USD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000

Tips & Tricks

Fuel conversion involves various cost increases beyond just shipbuilding and fuel costs.
Use this “Other costs” sheet to input any other company-specific costs.
You can also account for revenue by inputting a negative cost value.

This concludes the main sheets for data input and cost review.

On the following pages, we provide an overview of the other sheets. All of these sheets store data required for the simulation and the calculation results for each cost, so please feel free to review their contents as needed.

“Shipbuilding costs” sheet

This sheet shows the shipbuilding cost for each vessel.

“DF factor” sheet

This provides a guideline for the additional shipbuilding cost when adopting an alternative fueled vessel (compared to a conventional fueled vessel). The factor set here is used to calculate the “Ref. ship price (DF)” on the “Data input” sheet, but it does not affect the final shipbuilding cost estimation results.

“Fuel costs” sheet

This sheet shows the fuel cost for each vessel.

“Fuel type” sheet

This is a list of the fuel types assumed in the calculator. The fuel types set here are reflected as the options for the annual fuel type selection on the “Data input” sheet.

“IMO (Tier 1) costs” sheet

This sheet shows the Tier 1 contribution cost for each vessel under the IMO’s GFI regulations.

“IMO (Tier 2) costs” sheet

This sheet shows the Tier 2 contribution cost for each vessel under the IMO’s GFI regulations.

“IMO (Reward) costs” sheet

This sheet shows the reward revenue (as a negative cost) under the IMO’s GFI regulations.

“CB (IMO)” sheet

This sheet shows the compliance balance for each vessel under the IMO’s GFI regulations.

“GHG intensity (IMO)” sheet

This sheet shows the WtW (Well-to-Wake) GHG intensity for each vessel under the IMO’s GFI regulations.

“GHG intensity 1st fuel (IMO)” sheet

This sheet shows the WtW (Well-to-Wake) GHG intensity (1st fuel type) for each vessel under the IMO’s GFI regulations.
This determines whether the subject fuel is eligible for the “Reward”.

“GHG intensity 2nd fuel (IMO)” sheet

This sheet shows the WtW (Well-to-Wake) GHG intensity (2nd fuel type) for each vessel under the IMO’s GFI regulations.
This determines whether the subject fuel is eligible for the “Reward”.

“Fleet GHG intensity (IMO)” sheet

This sheet shows the average WtW (Well-to-Wake) GHG intensity for the entire fleet under the IMO’s GFI regulations.

“WtW GHG (IMO)” sheet

This sheet shows the WtW (Well-to-Wake) GHG emissions for each vessel under the IMO’s GFI regulations.

“TtW GHG (IMO)” sheet

This sheet shows the TtW (Tank-to-Wake) GHG emissions for each vessel under the IMO’s GFI regulations.

“Energy (IMO)” sheet

This sheet shows the energy consumption for each vessel under the IMO’s GFI regulations.

“Cf (IMO) - 1” sheet

This is a list of the conversion factors for each fuel as published in the IMO LCA Guidelines.
This sheet is not used in the calculator (Version 1.0).

“Cf (IMO) - 2” sheet

This is a list of the conversion factors used on a provisional basis to calculate the IMO’s GFI costs.
As of July 2025, the values for most conversion factors have not yet been determined in the IMO LCA Guidelines, and this list includes many assumptions made by ClassNK.

“EU-ETS costs” sheet

This sheet shows the EU-ETS cost for each vessel.

“TtW GHG (EU-ETS)” sheet

This sheet shows the TtW GHG emissions subject to the EU-ETS for each vessel.

“Energy (EU base)” sheet

This sheet shows the energy consumption for each vessel (for all voyages), calculated based on the lower calorific value of each fuel as listed in the FuelEU Maritime regulations.

“Energy (EU reg.)” sheet

This sheet shows the energy consumption subject to EU-ETS and FuelEU Maritime for each vessel.

“Cf (EU-MRV)” sheet

This is a list of the conversion factors for each fuel as published in the EU-MRV regulations. It includes some assumptions made by ClassNK.

“FuelEU Maritime costs” sheet

This sheet shows the FuelEU Maritime cost for each vessel.

“CB (FuelEU)” sheet

This sheet shows the compliance balance for each vessel under FuelEU Maritime.

“GHG intensity (FuelEU)” sheet

This sheet shows the WtW GHG intensity for each vessel under FuelEU Maritime.

“Fleet GHG intensity (FuelEU)” sheet

This sheet shows the average WtW GHG intensity for the entire fleet under FuelEU Maritime.

“WtW GHG (FuelEU)” sheet

This sheet shows the WtW GHG emissions for each vessel under FuelEU Maritime.

“GHG intensity limit (FuelEU)” sheet

This shows the limit for WtW GHG intensity under FuelEU Maritime.

“Penalty (FuelEU)” sheet

This shows the penalty unit price under FuelEU Maritime.
The penalty unit price for each vessel varies depending on its annual WtW GHG intensity value.

“Penalty multiplier (FuelEU)” sheet

This sheet shows the value “n”, which represents the number of consecutive years a vessel has been subject to penalties under FuelEU Maritime.

“RFNBO (FuelEU)” sheet

This shows the multiplier for RFNBOs* under FuelEU Maritime.
*RFNBO:Renewable Fuels of Non-Biological Origin

“Cf (FuelEU)” sheet

This is a list of the conversion factors for each fuel as published in the FuelEU Maritime regulations. It includes some assumptions made by ClassNK.

“Ship type” sheet

This is a list of the vessel types assumed in the calculator.
The vessel types set here are reflected as the options for “Ship type” on the “Data input” sheet.

“ME fuel type” sheet

This is a list of the main engine fuel types assumed in the calculator.
The types set here are reflected as the options for “ME” on the “Data input” sheet.

“ME (LNG) type” sheet

This is a list of the combustion cycles for LNG-fueled main engines assumed in the calculator.
They are reflected as the options for “ME (for LNG)” on the “Data input” sheet.

“GWP” sheet

This is a list of the Global Warming Potential (GWP) factors used in the calculator.
Please note that the referenced GWP values differ depending on the regulations.

ClassNK Fleet Cost Calculator
User Manual (Version 1.0)
[English]

For any inquiries regarding this manual, please contact the following:

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