CII user manual

March 2021
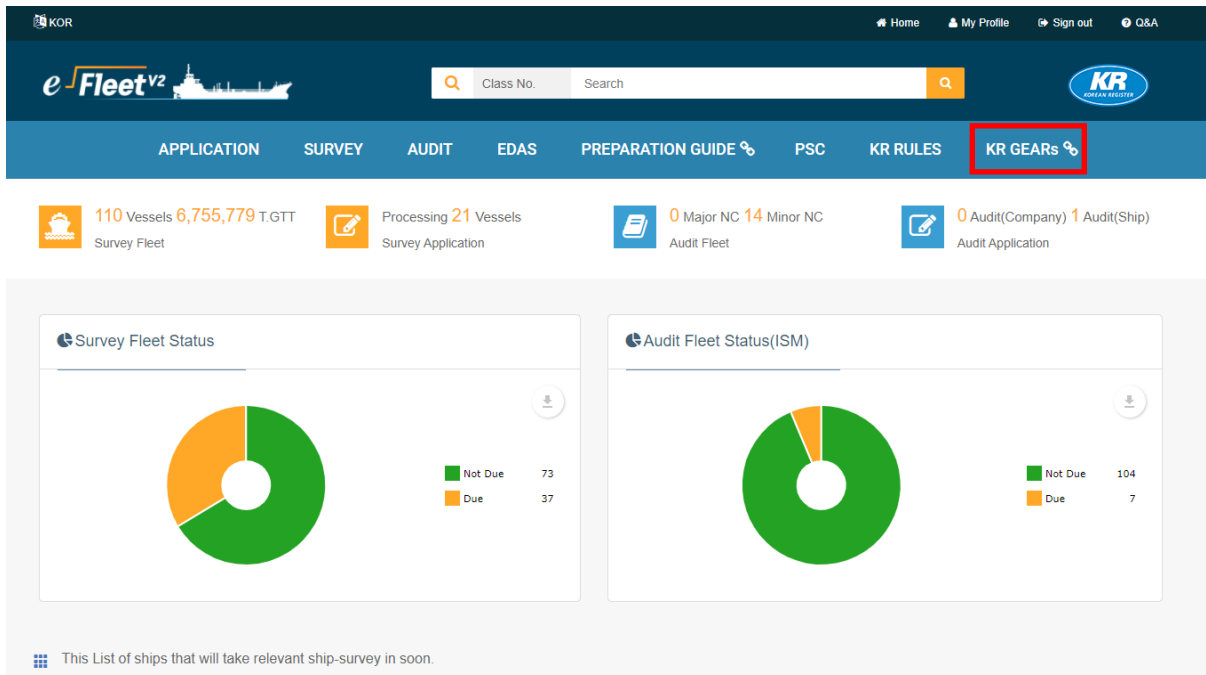
Korean Register

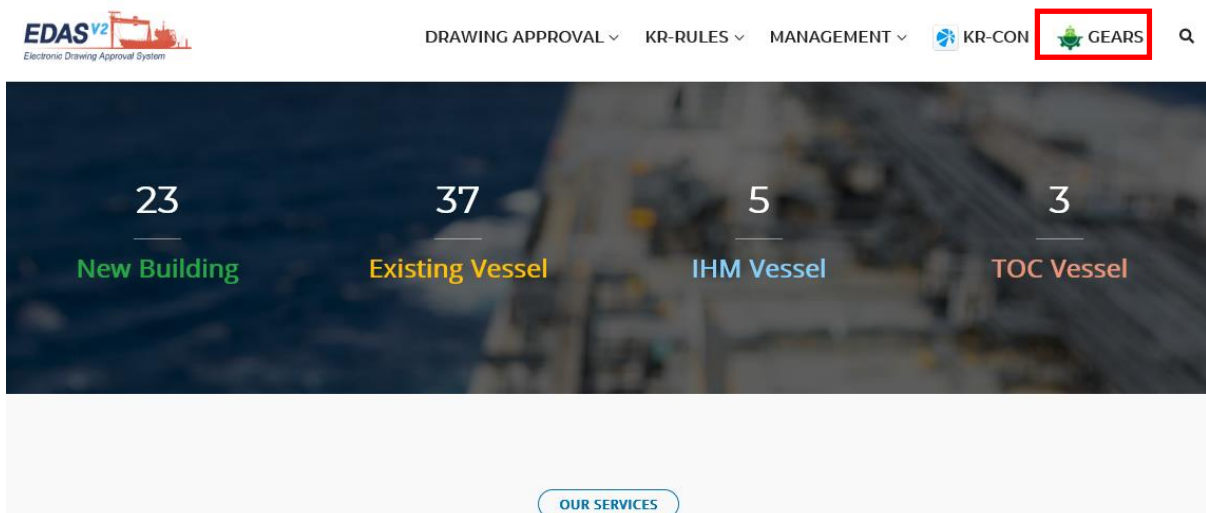# Contents

1. Login (https://gears.krs.co.kr)

1) If you have an KR E-fleet (for Ship Owner) & KR EDAS (for Ship Builder or Designer) registration account, you can log in through the corresponding ID/PW. If you don't remember your E-fleet & EDAS registration account, please contact decarbonization@krs.co.kr.
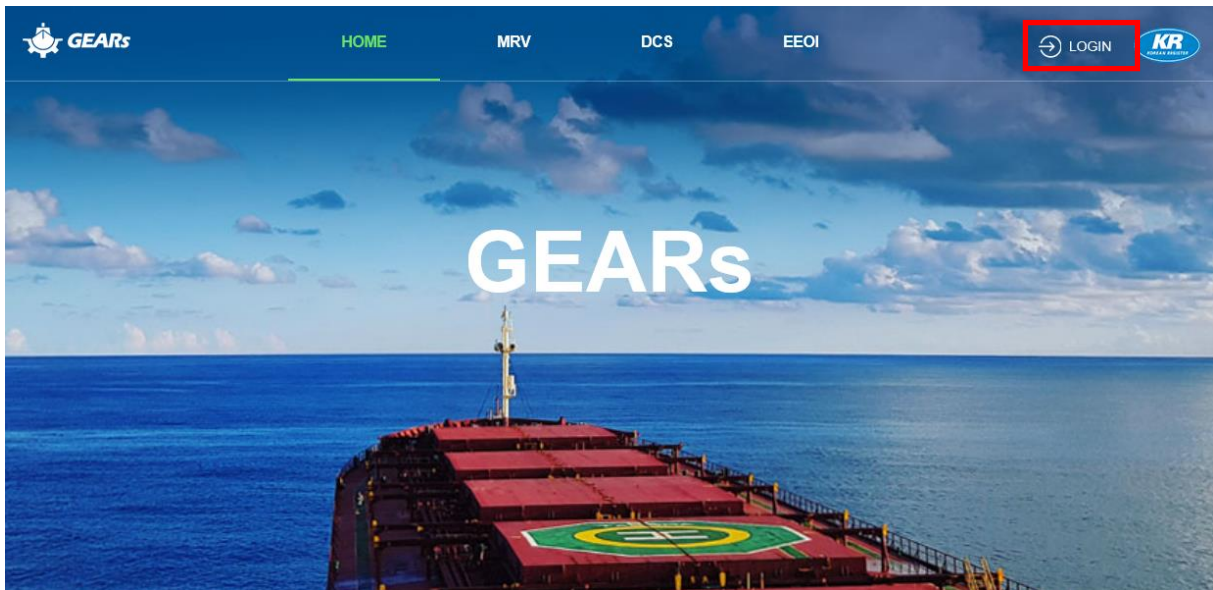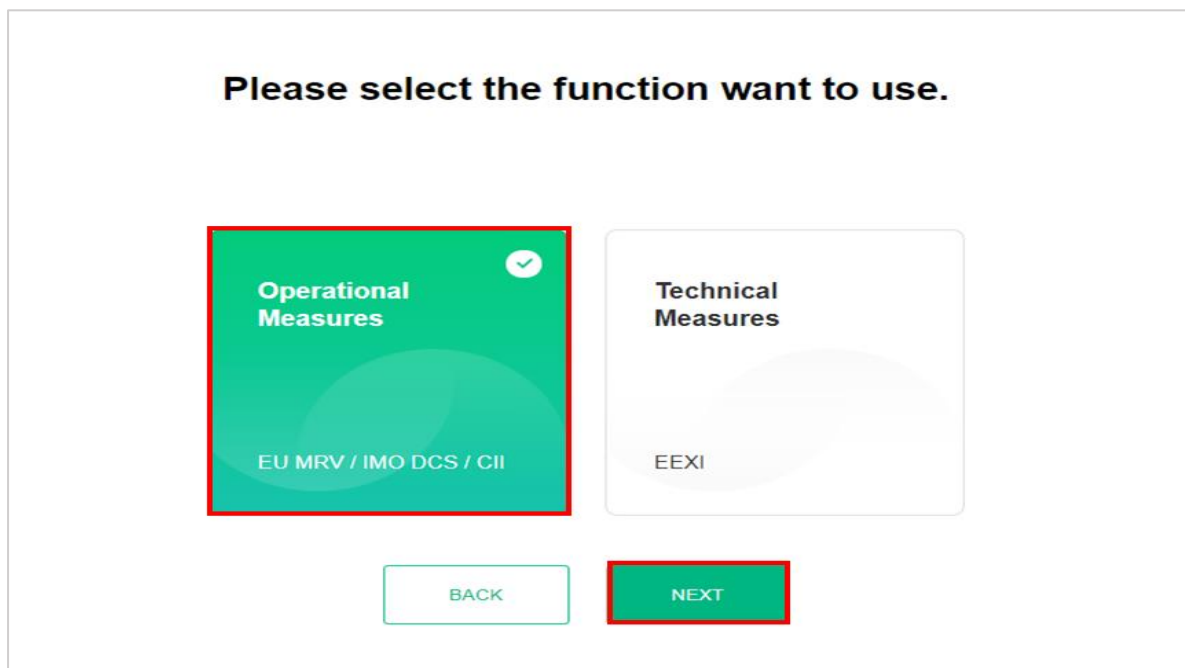

KR e-Fleet Main

KR EDAS Main

2) If you don't have an KR E-fleet & KR EDAS registration account, you can create an ID/PW by sending the request E-mail to decarbonization@krs.co.kr. And then you can use KR GEARs after login.

3) Access the KR GEARs, and log-in with your ID/PW.

4) Select **'Operational Measures'** in the page, and click **'NEXT'** button.

5) Click **'CII'** on the menu tab at the top of the page.

2. CII(Carbon Intensity Indicators)

The CII values are calculated based on **the annual IMO DCS data which was verified on KR GEARs**. CII values can be checked for each ship or selected ship type.

.1 SHIP

The user can check the CII value for each ship.

.1.1 CII Table

1) User can select the ship by selecting the ① **Ship Name**

2) The reference lines, reduction factors, and DD vectors that are the criteria for calculating CII rating can be checked by clicking ② **View CII Factor**

3) Based on the verified annual IMO DCS data, ③ **Required CII, Attained CII and CII Rating** are automatically calculated and shown as above.

.1.2 CII Chart (%)
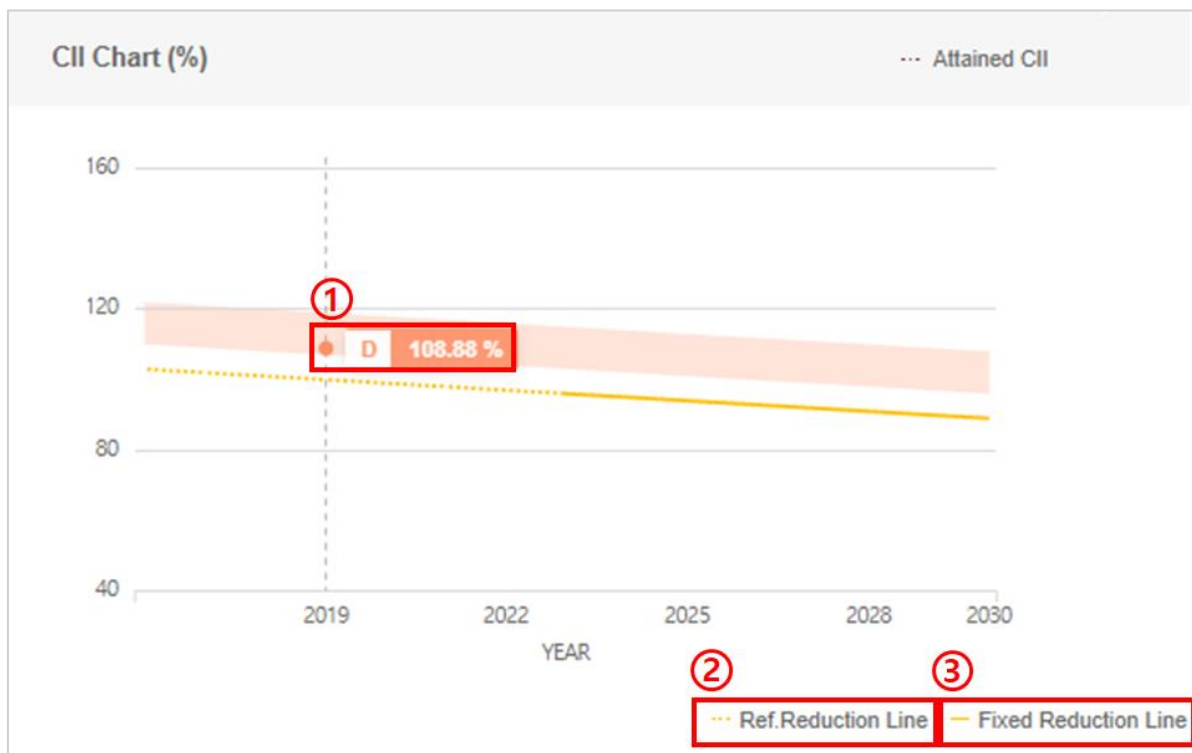
1) User can check the vessel's ① **annual rating** and the value (%) of the attained CII compared to the Required CII.

2) ② **Ref. Reduction Line** applied with the Ref. Reduction Factor (Before the regulation is enforced on 2023 years) is marked as a dotted line, and the ③ **Fixed Reduction Line** with a confirmed Reduction Factor from 2023 years is marked as a solid line.

.1.3 CII Rating Reduction Simulation

User can simulate how much Total tCO$_2$ values need to be reduced to improve the current rating of the ship.
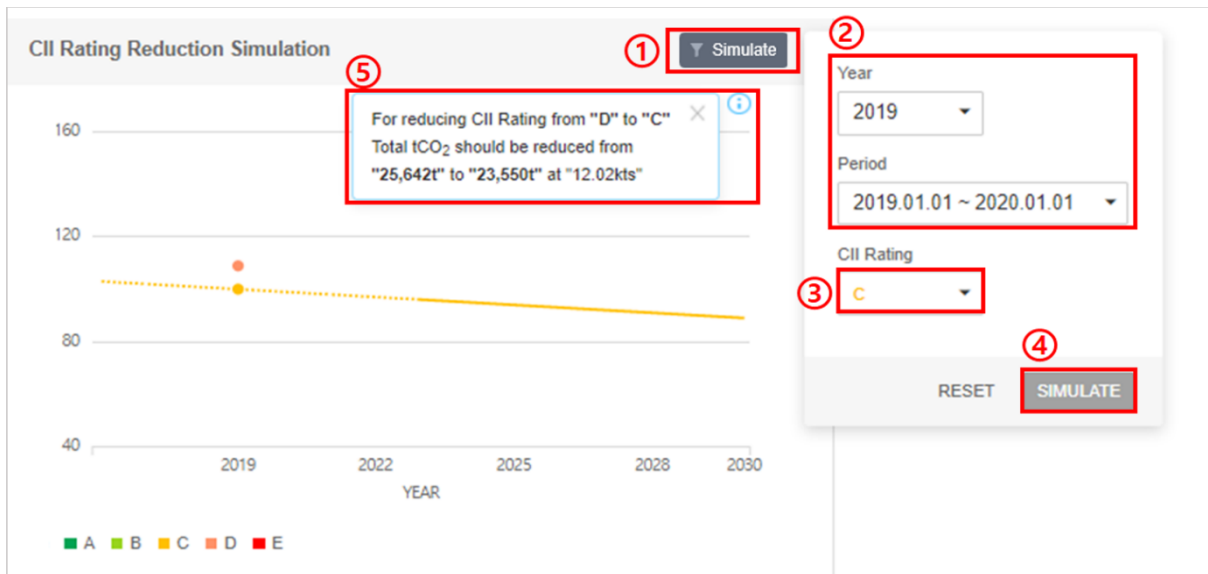
1) Click the ① **Simulate** icon.

2) Select the ② **Year, period and** ③ **CII Rating** the user want to simulate.

3) Click the ④ **Simulate** button to check the ⑤ **Total tCO$_2$ values need to be reduced from the average speed of the ship**.

.2 FLEET

User can check CII values for each ship type.
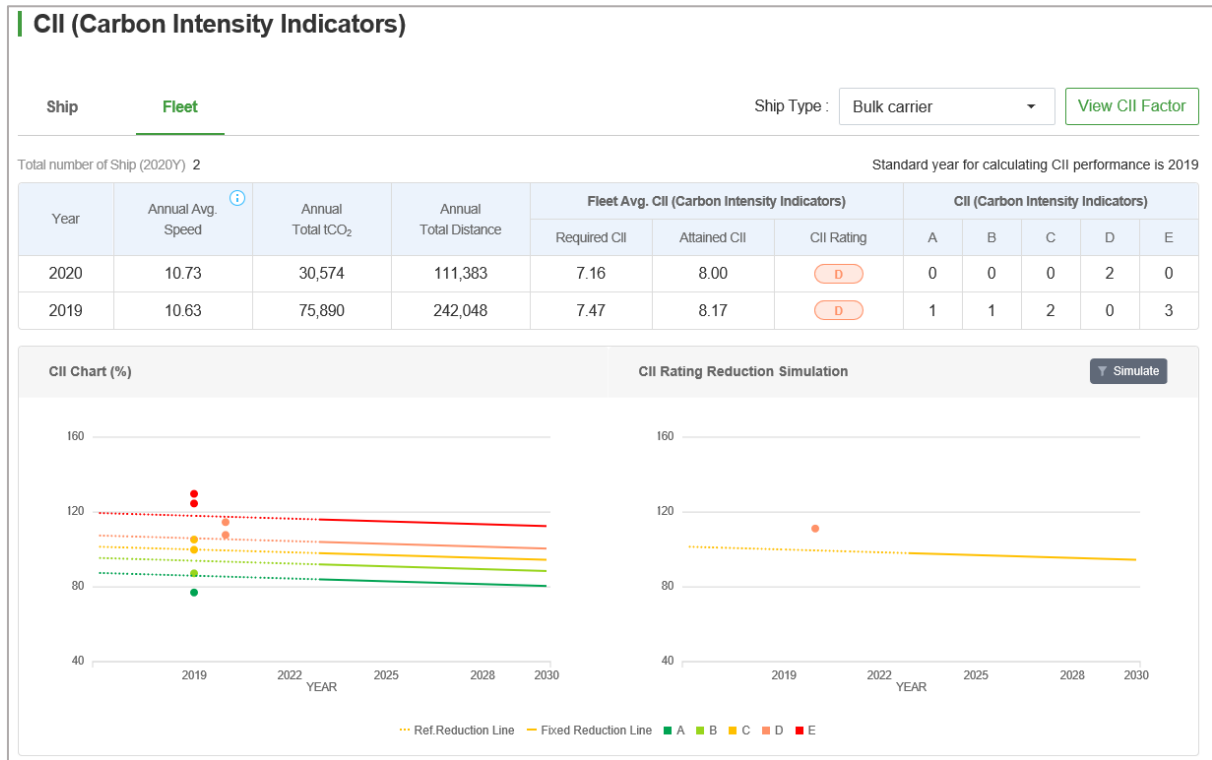
.2.1 CII Table

1) User can select the **Ship Type**.

2) **Annual Avg. Speed, Annual Total tCO$_2$,** and **Annual Total Distance** are calculated from each ship corresponding to the selected ship type and displayed.

3) The average for **Required CII/Attached CI**I is calculated, and **CII Rating** is shown based on the mean value.

4) User can check the number of vessel by **CII grade**.

.2.2 CII Chart
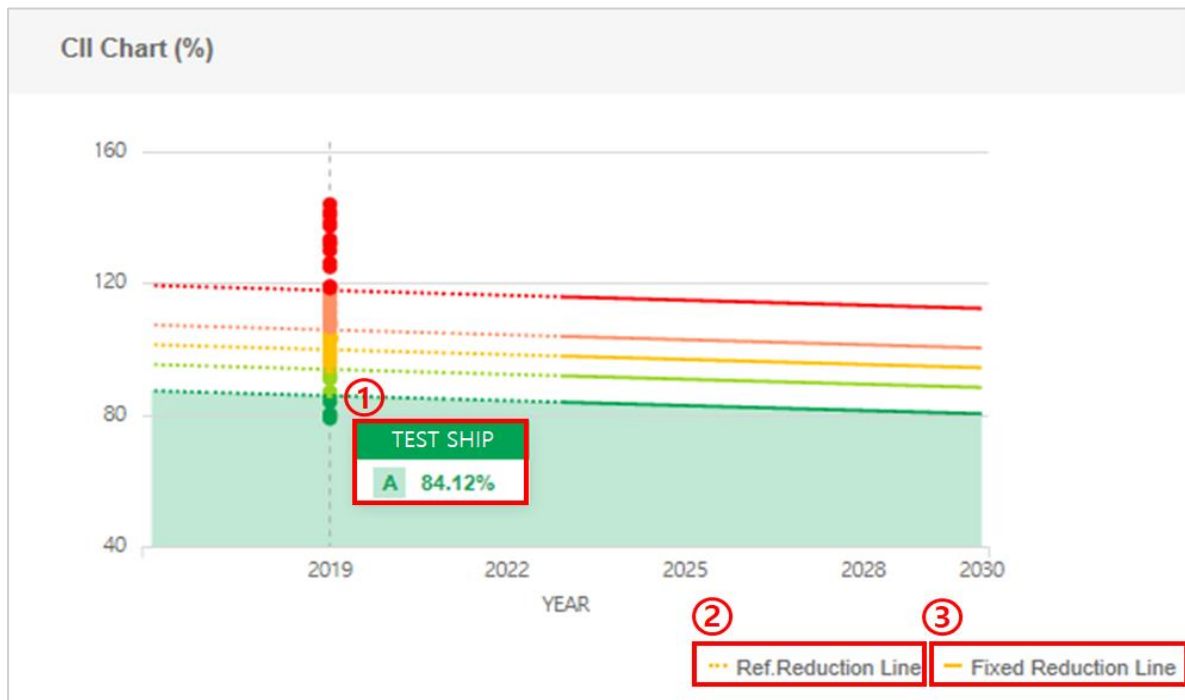
1) User can check the ① **Ship's CII grade per year** and the value (%) of the Attained CII compared to Required CII for the ship corresponding to the selected Ship Type.

2) ② **Ref. Reduction Line** applied with the Ref. Reduction Factor (Before the regulation is enforced on year 2023) is marked as a dotted line, and the ③ **Fixed Reduction Line** with a confirmed Reduction Factor from year 2023 is marked as a solid line.

.2.3 CII Rating Reduction Simulation

User can simulate how much Total tCO$_2$ values need to be reduced to improve the current rating of the selected **Ship Type**.
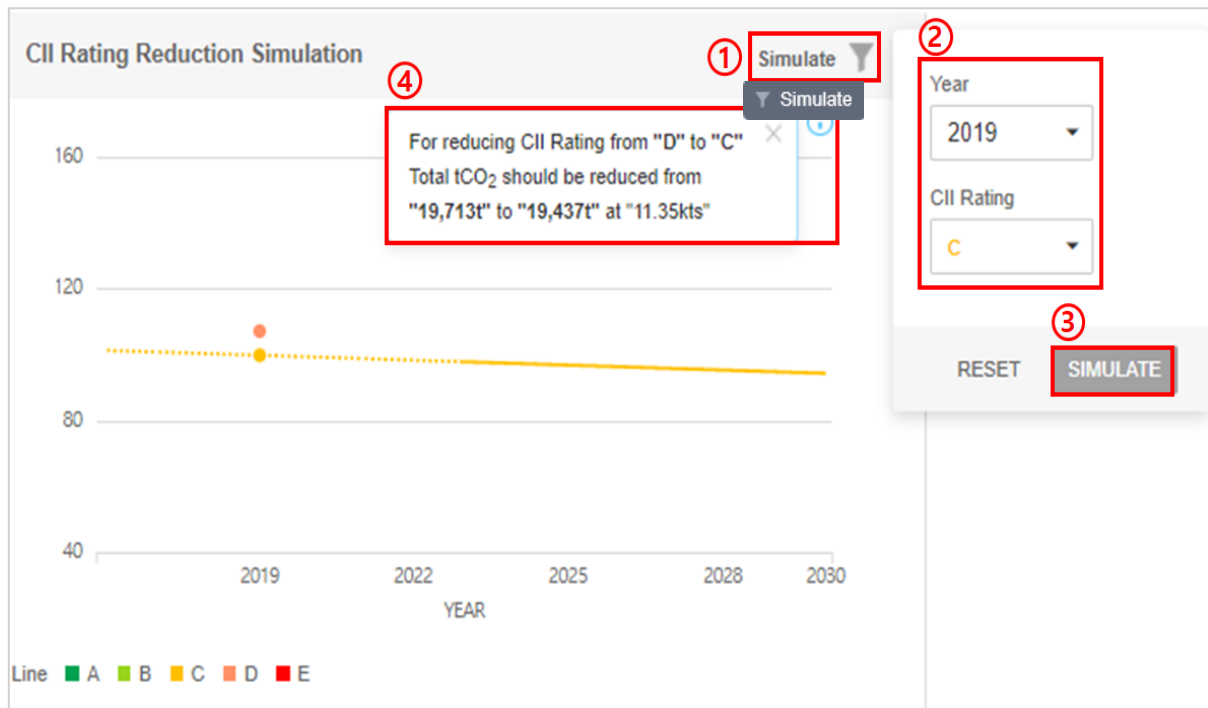
1) Click the ① **Simulate** icon.

2) Select the ② **Year and CII Rating** the user want to simulate.

3) Click the ③ **Simulate** button to check the ④ **Total tCO$_2$ values need to be reduced from the average speed of the selected Ship Type.**

.3   CII View Factor

| CII (Carbon Intensity Indicators)

User can click the **View CII Factor** to check the reference values for calculating CII rating.

.3.1 Table. 1A Reduction factors for the CII relative to the 2019 reference line

STANDARD FOR CALCULATING CII RATING

Table. 1A Reduction factors for the CII relative to the 2019 reference line

Ship Type		Capacity	Average Annual Improvement relative to 2019	Year											
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bulk carrier		DWT	0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%
Gas carrier	>= 65,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
	< 65,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
Tanker		DWT	0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%
Container ship		DWT	1.5%	0.0%	1.5%	3.0%	4.5%	6.0%	7.5%	9.0%	10.5%	12.0%	13.5%	15.0%	16.5%
General cargo ship	>= 20,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
	< 20,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
Refrigerated cargo carrier		DWT	1.5%	0.0%	1.5%	3.0%	4.5%	6.0%	7.5%	9.0%	10.5%	12.0%	13.5%	15.0%	16.5%
Combination carrier		DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
LNG carrier	>= 100,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
	< 100,000	DWT	1.0%	0.0%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%
Ro-ro cargo ship (vehicle carrier)		DWT	1.5%	0.0%	1.5%	3.0%	4.5%	6.0%	7.5%	9.0%	10.5%	12.0%	13.5%	15.0%	16.5%
Ro-ro cargo ship		DWT	0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%
		DWT	0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%

It shows the CII percentage to be reduced by every year according to Ship Type and Capacity.

.3.2 Table 1. dd vectors for determining the rating boundaries of ship types

STANDARD FOR CALCULATING CII RATING

Table 1. dd vectors for determining the rating boundaries of ship types

Ship Type		Capacity	dd vectors (after exponential transformation)			
			exp(d₁)	exp(d₂)	exp(d₃)	exp(d₄)
Bulk carrier		DWT	0.86	0.94	1.06	1.18
Gas carrier	65,000 DWT and above	DWT	0.79	0.89	1.12	1.38
	less than 65,000 DWT	DWT	0.85	0.95	1.06	1.25
Tanker		DWT	0.82	0.93	1.08	1.27
Container ship		DWT	0.83	0.94	1.07	1.19
General cargo ship		DWT	0.84	0.95	1.07	1.19
Refrigerated cargo carrier		DWT	0.77	0.90	1.07	1.21
Combination carrier		DWT	0.88	0.95	1.06	1.26
LNG carrier	100,000 DWT and above	DWT	0.91	0.98	1.05	1.11
	less than 100,000 DWT	DWT	0.77	0.91	1.12	1.37
Ro-ro cargo ship (vehicle carrier)		GT	0.86	0.94	1.06	1.16
Ro-ro cargo ship		DWT	0.67	0.90	1.09	1.37
Ro-ro passenger ship		GT	0.73	0.87	1.10	1.37

These are the values that divides the grade according to the Ship Type and the DWT or GT, which shows the maximum allowable reference value for each grade.

.3.3 Table. 1A Parameters for determining the 2019 ship type specific reference lines

STANDARD FOR CALCULATING CII RATING

Table.1A Parameters for determining the 2019 ship type specific reference lines

Ship Type		Capacity	a	c
Bulk carrier	279,000 DWT and above	279,000	4,977	0.626
	less than 279,000 DWT	DWT	4,977	0.626
Gas carrier	65,000 DWT and above	DWT	2.38E+10	1.910
	less than 65,000 DWT	DWT	8,032	0.638
Tanker		DWT	5,118	0.607
Container ship		DWT	1,963	0.487
General cargo ship	20,000 DWT and above	DWT	61,293	0.854
	less than 20,000 DWT	DWT	361	0.336
Refrigerated cargo carrier		DWT	6,736	0.599
Combination carrier		DWT	151,991	0.93
LNG carrier	100,000 DWT and above	DWT	9.86	0
	65,000 DWT and above, but less than 100,000 DWT	DWT	1.966E+13	2.498
	less than 65,000 DWT	65,000	1.966E+13	2.498

It shows the conversion coefficients for performing CII calculations.