Manual

Version 3.1

June 2026

KATALIST

Contents

1. Background & Scope

1.1. The aim of the Katalist registry (the "Registry") is to create a credible, transparent, and independent platform that standardizes the decoupling of sustainable maritime fuel ("SMF") sustainability attributes and provides the maritime industry with a tool to help accelerate decarbonization beyond regulatory compliance. The Registry is owned and administered by Fonden Mærsk McKinney Møller Center for Zero Carbon Shipping and RMI (together the "Registry Owners" or the "Administrator").

1.2. This manual describes how the Registry works by detailing the units used on the Registry, the Accounts on the Registry, and the rules for the different Registry functionalities. The annexes include details regarding the different data inputs and outputs of the Registry and the validation process for this data. This manual is not exhaustive in respect of all the terms and relevant information concerning the Registry. The manual is subject to the Terms of Use and supplemented by other information which can be found on the Registry Site.

1.3. This manual was developed by the Registry Owners, in consultation with a number of companies across the maritime value chain.

2. Version and Effective Period

2.1. This is version 3.1 of the manual, adopted June 2026.

2.2. This manual and the methodology and procedures for the Registry set out herein may be modified by publication of an updated version of the manual on the Registry Site. Major revisions will only be effective sixty (60) days following publication of the updated manual. Updates that involve no material change to the rights and duties of Registry Users and changes which concern new features on the Registry may become effective immediately.

3. The Registry & the Administrator

3.1. The Registry serves as an informative system for the listing, registration, independent validation, and independent verification of GHG emissions as well as the issuance (Booking), Transfer, Assignment, Unassignment, Removal, and Retirement of, and custodial services for, Environmental Attribute Certificates (EACs) within the Registry. The data comprising the Registry shall include information about a Voyage and its corresponding emissions provided to Administrator by a Registry User and verified by a third party according to the Requirements for Verification of Fuel Consumption and Transport Activity document found on the Registry Site.

3.2. The Administrator will act on behalf of the Registry Owners, overseeing all aspects of the Registry to ensure the smooth operation of the platform according to the rules defined in this Manual, the Terms of Use, and supplementary documents found on the Registry's Site.

4. Units in the Registry

4.1. The unit used in Katalist is an Environmental Attribute Certificate (EAC) which represents one terajoule (TJ) of sustainable maritime fuel (SMF) consumed during a Voyage. EACs contain information regarding the total CO_2eq emissions emitted, CO_2eq emissions savings, sustainability attributes of SMF, and transport work. Emissions are on a Well-to-Wake basis and include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), which are represented in carbon dioxide equivalent units (CO_2eq) using a global warming potential of 100 years as per the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5). A complete breakdown of the information contained in each EAC is found in Annex V.

4.2. There are two types of EACs on the Registry: SMF-1 and SMF-3, representing the Scope 1 and Scope 3 emissions from an SMF respectively. When EACs are Booked on the Registry both SMF-1 and SMF-3 are created.

4.3. EACs marked as "vol" (voluntary) are considered as additional and EACs marked as "comp" (compliance) are considered not additional based on how they are rated against the Additionality Criteria set out in Annex XI.

4.4. EACs can have different statuses at any time within the Registry, defined below.

4.4.1. Active: An SMF-3 that has not been Retired.

4.4.2. Partially retired: An SMF-3 that has been Retired on a Freight Forwarder Account but not Retired on a Cargo Owner Account. The SMF-3 can be Transferred to and Retired by an Account Representative of a Cargo Owner Account or Retired on Behalf of an Off Registry Customer. The SMF-3 can be Assigned to a Facilitator Account and then Transferred to and Retired by an Account Representative of a Cargo Owner Account or Retired on Behalf of an Off Registry Customer.

4.4.3. Fully retired: For SMF-3, this status is when it has either been Retired on a Cargo Owner Account or Retired on Behalf of an Off Registry Customer. All SMF-1 has this status upon completion of Booking.

4.4.4. Blocked: No action can be taken on the EAC due to suspected irregularity. Only SMF-3 can be blocked.

4.4.5. Removed: The EAC is removed permanently from Registry and no action can be taken on it. Only SMF-3 can be removed.

4.4.6. Expired: An EAC has exceeded the vintage period, see Sec. 6.3.3. No further actions can be taken it. Only SMF-3 can have an expired status.

4.5. The Actions that can be taken with EACs are further explained in Sec. 6-14.

5. Accounts in the Registry

5.1. Setting up a Registry User

5.1.1. A legal entity aiming to open Accounts in the Registry shall first register itself as a Registry User by filling out and submitting the Subscription Form available on the Registry Site, which includes providing the Registry the information set out in Annex I, and nominating at least one Company Representative by providing the information set out in Annex II.

5.1.2. The Administrator shall open the Account or refuse opening it within twenty one (21) calendar days of receipt of the Subscription Form, including the required information and documentation as set out in Annexes I and II. The Registry User will be informed of the acceptance of the Registry User by email.

5.2. Company and Account Representatives

5.2.1. A Company Representative is a natural person nominated by the Registry User to manage the Accounts of the Registry User. If the Registry User has no active Company Representatives, the Registry User shall nominate a new natural person to act as Company Representative.

5.2.2. An Account Representative is a natural person appointed by a Company Representative to manage an Account on behalf of the Registry User. A Company Representative can also be nominated as the Account Representative of one or more Accounts belonging to the Registry User. Every Account must have at least one Account Representative.

5.2.3. A Company Representative may also appoint persons with read-only access to Accounts.

5.2.4. A Company Representative does not have the right to initiate or approve Actions unless such Company Representative is also an Account Representative. A Company Representative can remove access for Account Representatives and persons with read-only access. A Company Representative can close an account.

5.2.5. An Account Representative can initiate and/or approve Actions.

5.2.6. Before using the Registry, Company Representatives and Account Representatives are required to confirm that they have read and agreed to the Terms of Use.

5.3. Account types on the Registry

5.3.1. Shipping Company Account (SCA): SMF-1 and SMF-3 can be Held in this Account and the following actions can be performed: Booking, Transferring, Assigning, Unassigning, and Retiring on Behalf of an Off Registry Customer.

5.3.2. Freight Forwarder Account (FFA): SMF-3 can be Held in this Account and the following actions can be performed: Transferring, Assigning, Unassigning, and Retiring.

5.3.3. Cargo Owner Account (COA): SMF-3 can be Held in this Account and the following actions can be performed: Retiring for a Registry User.

5.3.4. Facilitator Account (FAA): SMF-3 can be Assigned to this Account and the following actions can be performed: Transferring and Retiring on Behalf of an Off Registry Customer.

5.4. Setting up an Account

5.4.1. An Account shall be opened by the Administrator at the request of the Company Representative. When requesting the opening of the Account, the Company Representative shall nominate at least one Account Representative in accordance with Annex II.

5.4.2. One Registry User may hold multiple Accounts, but one Account shall belong only to one Registry User. A Registry User with a Facilitator Account may not open other Account types. Accounts may only have one of the Account types set out in Sec. 5.3.

5.4.3. The Administrator shall open the Account or refuse opening it within three (3) calendar days of receiving the request on the platform. The Registry User will be informed of the opening of the Account by email.

5.5. Account Statuses and transferability

5.5.1. Accounts can be in one of the following statuses: “active”, “blocked” or “closed”. Accounts must be active in order to Book, Hold, Transfer, Assign, Unassign, Retire, Block, or Remove EACs.

5.5.2. Accounts are not transferable.

5.6. Blocking Account

5.6.1. The Administrator is entitled to Block the Account or Accounts of a Registry User if:

5.6.1.1. The Registry User has failed to pay any outstanding Registry fees despite repeated notifications; or

5.6.1.2. The Registry User did not notify the Administrator about changes to Account information or provide evidence concerning changes to Account information or concerning new requirements on Account information; or

5.6.1.3. The Administrator considers that the opening of the Account should have been refused; or

5.6.1.4. The Registry User has violated or failed to accept a new version of the Terms of Use.

5.6.2. The Administrator may Block an Account if the Administrator or a law enforcement agency has reasonable grounds to believe that the Account is

or was used for fraud, money laundering, terrorist financing, corruption, or other serious crimes.

5.6.3. The Administrator may unblock the Account once the reasons that gave rise to blocking are eliminated.

5.7. Closing Account

5.7.1. The Administrator shall close an Account at the request of the Registry User, or the Company Representative can close their Account on their own.

5.7.2. Active EACs in Accounts to be closed must be removed or Transferred to an active Account prior to closing an Account.

5.8. Registry User and Account information and updates

5.8.1. The Company Representatives shall, as soon as reasonably practicable, inform and request the Administrator to update the information listed in Annex I and II relating to the Registry User and the Representatives as may be required to ensure the information is sufficient and correct.

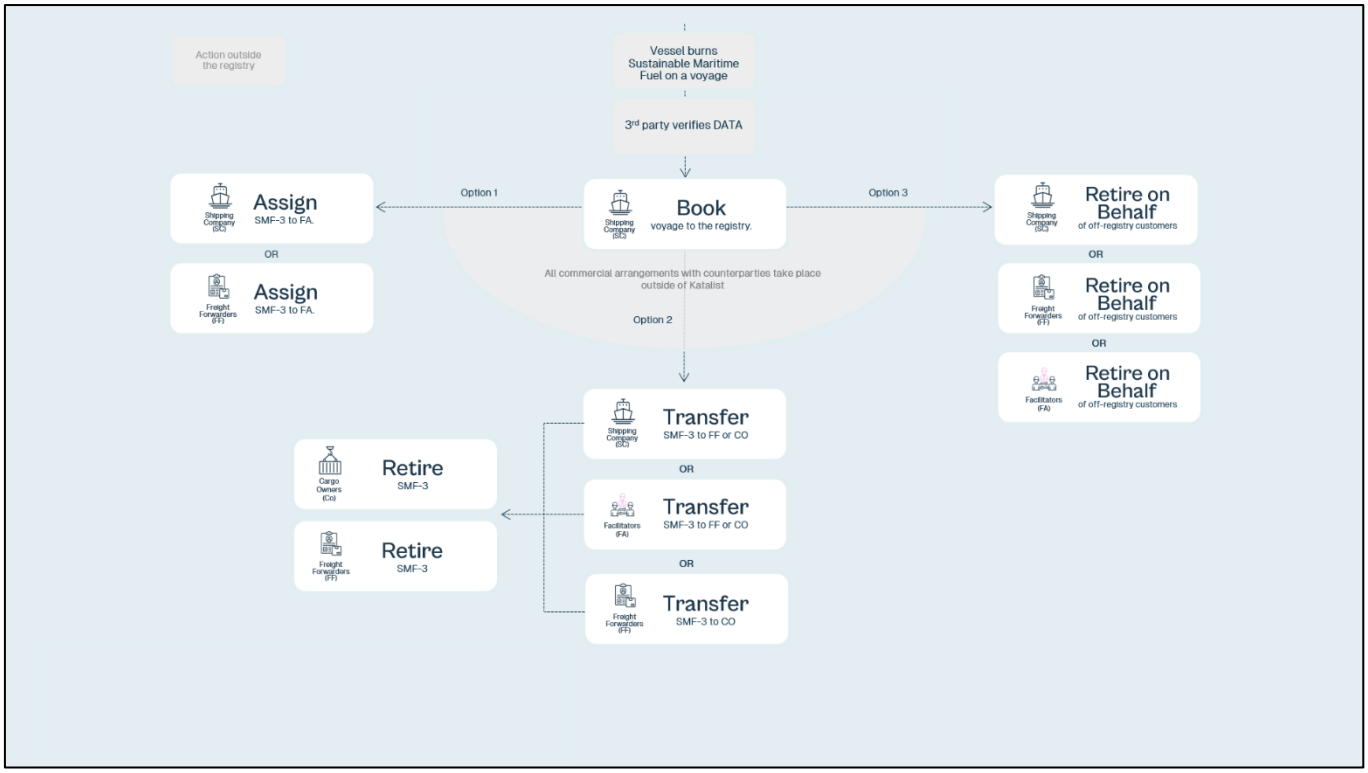
5.8.2. The Account Representatives shall inform and request the Administrator to update the information listed in relation to the Account as may be required to ensure the information is sufficient and correct.

5.8.3. The Representatives shall, subject to the KYC procedures, provide all such information and documentation as the Administrator may request to verify the information listed in Annexes I and II for the purpose of updating the information.

6. Overview of Key Registry Actions

6.1. The sequence of key Registry Actions is outlined in Figure 1.

Figure 1: Key Registry Actions



6.2. Each Account may engage in the following Actions identified in Table 1 for SMF-3 with a "vol" label, see Sec 4.3. The only permitted Actions for SMF-1 is for an SCA to Book, Hold, and Retire for a Registry User. No other Action is permitted for SMF-1. There are no permitted Actions for SMF-3 with a "comp" label.

Table 1-Permitted Actions for SMF-3 with "vol" label by Account Type

Action / Role	SCA	FFA	COA	FAA
Book	Yes	No	No	No
Hold	Yes	Yes	Yes	No
Transfer	Yes	Yes	No	Yes
Retire for a Registry User	No	Yes	Yes	No
Retire on Behalf of an Off Registry Customer	Yes	Yes	No	Yes
Assign/Unassign	Yes	Yes	No	No
Receive Assigned EACs	No	No	No	Yes

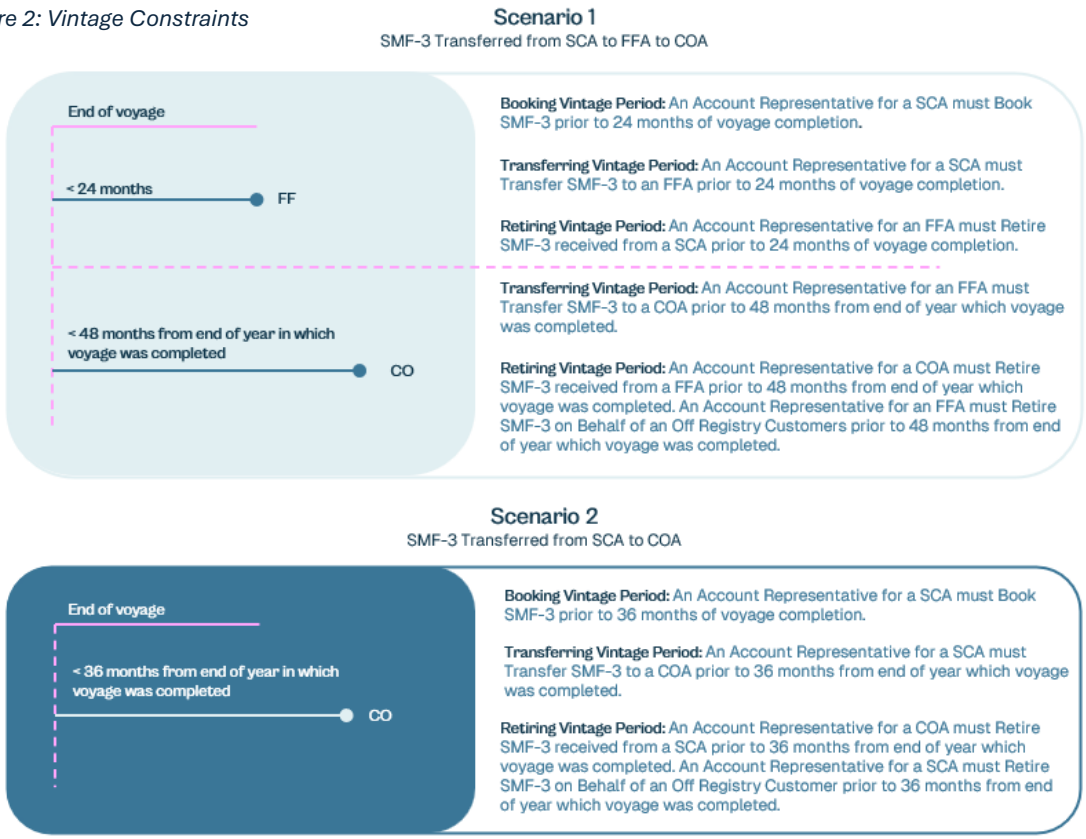
6.3. General rules for all Actions

6.3.1. Each Account type may only initiate the Actions permitted for it set out in Table 1.

6.3.2. The Administrator shall perform checks for all Actions initiated by an Account Representative and may reject Actions that do not meet the requirements set out in this Manual. The Registry will automatically check for data irregularities or errors.

6.3.3. All Actions in Registry must take place within the Vintage Periods outlined in Figure 2. Assignment or Unassignment of EACs does not impact Vintage Periods, and the Vintage Period follows the rules for the Account Type that owns the EAC. An Account Representative may be able to perform an Action within the Vintage Period but be unable to perform any subsequent Actions on this EAC if the Vintage Period is subsequently exceeded.

Figure 2: Vintage Constraints



7. Book

7.1. The Account Representative for an SCA will Book EACs by providing the Data Questionnaire and supporting documents to the Registry following the requirements listed in Annex IV.

7.2. SMF used in Voyages to be Booked must be certified under a recognized Sustainability Certification Scheme (SCS) from the Roundtable on Sustainable Biomaterials (RSB) or the International Sustainability & Carbon Certification (ISCC). This is according to IMO interim guidelines on biofuels for reporting data

to the Carbon Intensity Indicator (CII) and Data Collection System (DCS). This requirement will be adjusted once IMO's LCA GHG guidance is updated.

7.3. All SMF Booked must explicitly include all environmental attributes, including Scope 1 and Scope 3 emissions. EACs Booked from SMF that is part of a blend will reflect the emission characteristics of the blend, see Annex IX, Sec. 2.

7.4. All Booked SMF must have been consumed during a Voyage.

7.5. When data is submitted, the Registry conducts automated checks on the Booking request, ensuring data format and completeness. The Administrator also validates the data as described in Annex X, checks that it is within the Vintage Period set out in Sec. 6.3.3, and the Registry automatically labels EACs as "vol" or "comp" based on the Additionality Criteria listed in Annex XI. The Registry automatically calculates the energy content, the GHG emissions, the emission intensity, and the transport work for the fuels used during the Voyage as per Annex IX.

7.6. Upon the Administrator's approval, both SMF-1 and SMF-3 shall be credited to the SCA. The information visible on EACs that are credited is defined in Annex V.

7.7. SMF-1 that are credited towards the SCA are automatically marked as Retired by the Registry and no further actions can be taken. SMF-3 that are credited towards the SCA can be Transferred to either an FFA or COA as per Sec. 8, Assigned to a FAA as per Sec. 9, or Retired on Behalf of an Off Registry Customer as per Sec. 11.

8. Transfer

8.1. SMF-3 marked as "vol" can only be Transferred 1) from SCA to FFA, 2) from an SCA to a COA, 3) from a FFA to a COA, 4) from a FAA to a FFA, or 5) from a FAA to a COA. SMF-3 that have been Assigned by a FFA to a FAA cannot be Transferred to a FFA. SMF-3 marked as "comp" and SMF-1 cannot be transferred, see Sec 6.2.

8.2. SMF-3 can be Transferred in a fraction up to three decimal points if the SMF-3 are active or partially retired and within the Vintage Period set out in Sec. 6.3.3 and Figure 2.

8.3. The Account Representative may request the Transfer of active or partially retired SMF-3 to another active Account by selecting the SMF-3 to be Transferred, either by SMF-3 quantity, quantity of emission savings, or quantity of Transport Work, and by inputting the Account ID of the recipient's Account. The Account Representative may also include a text comment with the transfer with the option to include this comment in the Retirement Statement. The Account Representative that is Transferring the SMF-3 from an SCA must select whether credits should be included, see Sec. 2.2 in Annex IX, and the Fossil Baseline of Reference used to calculate GHG emission savings for the Transferred SMF-3, see Annex VIII. The Account Representative Transferring SMF-3 from an SCA may

also select the option to include transport work information corresponding to the SMF-3 as per Annex IX, Sec. 6.

8.4. After conducting the necessary checks, the Registry sends the Transfer request to the recipient's Account to confirm the acceptance of the Transfer. If acceptance is confirmed within fourteen (14) days, and upon the Administrator's approval, the Registry carries out the Transfer. If no confirmation is received or the Administrator rejects the Transfer, the Transfer fails.

8.5. A Registry User holding both an SCA and FFA is not permitted to Transfer SMF-3 from their own SCA to their own FFA.

9. Assign and Unassign

9.1. SMF-3 marked as "vol" can only be Assigned to a FAA by an SCA or FFA. SMF-3 marked as "comp" and SMF-1 cannot be Assigned, see Sec. 6.2.

9.2. SMF-3 can be Assigned in a fraction up to three decimal points if the SMF-3 are active or partially retired and within the Vintage Period set out in Sec. 6.3.3 and Figure 2.

9.3. The Account Representative may request the Assignment of active or partially retired SMF-3 to a FAA by selecting these SMF-3 to be Assigned, either by SMF-3 quantity, quantity of emission savings, or quantity of Transport Work, and by inputting the Account ID of the recipient's Account. The Account Representative may also include a text comment with the Assignment. The Account Representative that is Assigning the SMF-3 from an SCA must select whether credits should be included, see Sec. 2.2 in Annex IX, and the Fossil Baseline of Reference used to calculate GHG emission savings for the Assigned SMF-3, see Annex VIII. The Account Representative Assigning SMF-3 from an SCA may also select the option to include transport work information corresponding to the SMF-3 as per Annex IX, Sec. 6.

9.4. After conducting the necessary checks, the Registry sends the Assignment request to the recipient's Account to confirm the acceptance of the Assignment. If acceptance is confirmed within fourteen (14) days, and upon the Administrator's approval, the Registry carries out the Assignment. If no confirmation is received or the Administrator rejects the Assignment, the Assignment fails.

9.5. An Account Representative for an SCA or FFA may Unassign SMF-3 that have been Assigned to a FAA by selecting the SMF-3 and selecting Unassign. All pending Actions are cancelled for the Unassigned SMF-3, and the SMF-3 are credited back to the SCA or FFA account after 48 hours, with the data points selected in Sec. 9.3 automatically reset by the Registry. SMF-3 that the FAA has successfully Transferred or Retired on Behalf of an Off Registry Customer may not be Unassigned.

10. Retire for a Registry User

10.1. An Account Representative of an FFA or COA may request to Retire an active or partially retired SMF-3 on its Account. An Account Representative of a FAA cannot request to Retire SMF-3 on its own Account. An Account Representative of an SCA cannot request to Retire any SMF-1 or SMF-3 on its Account, but they can request to Retire SMF-3 on Behalf of an Off Registry Customer, as described in Sec. 11.

10.2. SMF-3 can be Retired in a fraction up to three decimal points. SMF-3 must be Retired within their Vintage Period as set out in Sec. 6.3.3 and Figure 2.

10.3. SMF-3 can be Retired up to two times and only once per Account type.

10.4. An Account Representative of an FFA can Retire SMF-3 and Transfer this SMF-3 to a COA, or Assign this SMF-3 to a FAA, as long as it is Transferred or Assigned within the Vintage Period of that SMF-3. Upon Retirement on an FFA, the SMF-3's status is changed to partially retired. SMF-3's status changes to fully retired after it has been Retired on a COA, even if the SMF-3 has not been Retired on an FFA.

10.5. When requesting a Retirement, the Account Representative shall designate the calendar year for which the Retirement shall apply, i.e., the year in which the Registry User intends to report emissions reduction claims about the use of the SMF.

10.6. When SMF-3 has been Retired on a COA, the SMF-3 will be included in the Public Retirement Table with the information as per Annex VII. During the Retirement, the Account Representative of an FFA and COA may select the option to include the name of their Registry User in the Public Retirement Table.

11. Retire on Behalf of an Off Registry Customer

11.1. An Account Representative of an SCA, FFA, or FAA may request to Retire SMF-3 on Behalf of an Off Registry Customer. Only SMF-3 marked as "vol" can be Retired on Behalf of an Off Registry Customer. SMF-3 can only be Retired on Behalf of an Off Registry Customer that does not have the same value chain role as any Registry User who has Retired the SMF-3. SMF-3 marked as "comp" and SMF-1 cannot be Retired on Behalf of an Off Registry Customer, see Sec. 6.2.

11.2. SMF-3 can be Retired on Behalf of an Off Registry Customer in a fraction up to three decimal points if the SMF-3 is active or partially retired and within the Vintage Period set out in Sec. 6.3.3 and Figure 2.

11.3. The Account Representative must register the Off Registry Customer by submitting the information described in Annex III to the Registry. The Account Representative is only required to submit this information the first time they Retire on Behalf of such Off Registry Customer. The Registry automatically sends

the Off Registry Customer an e-mail notification of this registration, and the Off Registry Customer must confirm acceptance of this registration within fourteen (14) days of receiving the notification. If no confirmation is received by the Administrator within such deadline, the registration fails. If confirmation is received, the Registry automatically sends the draft Retirement Statement as per Sec. 11.5.

11.4. The Account Representative may request to Retire active or partially retired SMF-3 on Behalf of an Off Registry Customer by selecting these SMF-3 either by SMF-3 quantity, quantity of emission savings, or quantity of Transport Work, and registering the Off Registry Customer as described in Sec. 11.3, or if already registered, by selecting the Off Registry Customer. The Account Representative of an SCA must select whether credits should be included, see Sec. 2.2 in Annex IX, and the Fossil Baseline of Reference used to calculate GHG emission savings for the SMF-3, see Annex VIII. The Account Representative must select the calendar year for which the Retirement shall apply; whether the name of the Off Registry Customer should be included in the Public Retirement Table; and whether the transport work information corresponding to the SMF-3 should be included as per Annex IX Sec. 6. The Account Representative may also include a text comment with the Retirement on Behalf with the option to include this comment in the Retirement Statement of the Off Registry Customer.

11.5. The Registry automatically sends the Off Registry Customer an e-mail with the draft Retirement Statement and the Off Registry Customer must confirm acceptance of the Retirement on its Behalf within fourteen (14) days of receiving the notification. If no confirmation is received by the Administrator within such deadline, the Retirement fails. If a confirmation is received, the Administrator conducts the necessary checks and the Off Registry Customer receives the final Retirement Statement via e-mail. SMF-3's status changes to fully retired after it has been Retired on Behalf of an Off Registry Customer, and the SMF-3 will be included in the Public Retirement Table with the information as per Annex VII.

12. Claim

12.1. Upon Retirement, SMF-1 and SMF-3 turn into Scope 1 and Scope 3 Claims, respectively, and may be Claimed for reporting purposes by the party that is designated on the Retirement Statement. The claims are made outside of and do not require any Action in the Registry.

12.2. Registry Users and Off Registry Customers are only entitled to make Claims for SMF-3 that have been Retired. All Claims must refer to the information contained in the Retirement Statement as per Annex VI and occur within the vintage period as set out in Sec. 6.3.3 and Figure 2.

12.3. SMF-3 shall only be Claimed within the maritime sector and emission reductions shall not exceed the party's total GHG footprint within the maritime sector for any given year.

12.4. Cargo Owners may sell, Transfer and otherwise Assign the reductions related to retired SMF-3 within their own customer base but are otherwise not permitted to sell, transfer or otherwise assign the reductions relating to retired SMF-3 to other companies or organizations.

13. Blocking & Unblocking

13.1. The Administrator may block an EAC if it has reasonable grounds to suspect that some irregularity took place during the Booking, Transferring, Assigning, Unassigning, or Retiring of the EAC. The owner of the EAC may also request the Blocking of an EAC on the same grounds. A Blocked EAC may not undergo any Actions.

13.2. The Administrator shall Unblock an EAC if the suspicions were proven to be unfounded, or if requested by the owner of the EAC that requested the initial Blocking, unless the Administrator still has reasonable grounds to suspect irregularities.

13.3. Blocking shall not influence the EAC's Vintage Period.

14. Removal & Expiration

14.1. The Registry User holding an active Account may request the Administrator remove an EAC from its Account.

14.2. The Administrator may remove EACs if it is established that irregularities took place during the Booking, Transferring, Assigning, Unassigning, or Retiring of the EAC and that these cannot be remedied otherwise.

14.3. The Administrator may also remove expired or retired EACs for administrative, security, data management, or privacy purposes.

14.4. The Registry shall automatically set to expired status any EAC that has reached the end of its Vintage Period in accordance as set out in Sec. 6.3.3 and Figure 2.

15. Management of the Registry

15.1. The Registry Owners may engage a professional IT organization to manage the daily operations of the Registry in accordance with this Manual on behalf of the Registry Owners.

15.2. The Registry Owners, or any professional IT organization engaged by the Registry Owners from time to time, opens, blocks, or closes Accounts, reviews

and approves Company Representatives and Account Representatives, implements changes, and operates the helpdesk for the Registry.

15.3. The Registry Owners engage, oversee and instruct the work of any professional IT organization engaged by the Registry Owners from time to time, oversee the implementation of Registry changes by such, if any, and keeps the Manual up-to-date in line with any changes.

15.4. The Registry Owners will assemble a Registry Expert Committee from a group of companies from the maritime industry and/or book and claim expert space. The Registry Expert Committee will be a consultative body set up to discuss the Registry methodology and to provide guidance to the Registry Owners on major revisions to the Registry methodology and the Manual.

Annex I | Information required to Register a Company as Registry User

When setting up a Registry User in the Registry, the representative of the requesting legal person must in the Subscription Form (as accessible on the Registry Site) provide the Administrator with the following information on the Registry User:

- Entity name
- Entity address
- Entity registration number
- Country of incorporation
- Entity website (if any)
- Entity VAT number (not applicable to entities with only COA)
- Entity email for e-invoice (not applicable to entities with only COA)
- Email of the invoice approver (not applicable to entities with only COA)
- Purchase Order number for invoicing (not applicable to entities with only COA)

Furthermore, the Registry User shall provide the following documentation:

- A copy of the memorandum of association, certificate of incorporation and/or any equivalent documents of the Registry User (depending on the country of incorporation);
- The bylaws/articles of association or any equivalent documents of the Registry User (depending on country of incorporation); and
- A duly executed power of attorney granting the signatory of this Subscription Form the power to sign on behalf of the Registry User (if such is required under applicable law in order for the signatory to bind the Registry User)

Following submission of the Subscription Form, the Administrator may (but is not required to) also request the following additional documentation and information:

- A confirmation and official documentation evidencing who is duly authorized to sign on behalf of the Registry User according to its signing rules and/or according to a power of attorney;
- Any documentation necessary to satisfy, in the sole discretion of the Administrator, the Administrator's 'Know-Your-Customer' (KYC) requirements relating to the Registry User (such as information on its beneficial owner or a list of its registered directors) or the Company Representative (such as an identity card, passport, or other personal identification document, or an affidavit certified by a notary public);

- Information on whether the Registry User has Accounts in other registries of similar scope that sell environmental attributes of fuel used in ocean transport or emissions from ocean transport services;
- Information on whether the Registry User has affiliated companies or business partners who already have Accounts in the Registry; and
- Any other information reasonably required by the Administrator.

Any evidence required might be supplied with scanned copies of originals, digitally certified copies, or, at the request of the Administrator, copies certified by a notary public consider, and/or legalized. If the documents are not in English, and English translation may be requested by the Administrator.

Annex II | Information required to Appoint a Company and Account Representative

When appointing a natural person as Company Representative or as Account Representative as set out in this Manual, Sec. 5.2, the following personal information is to be provided in respect of such person(s):

- Name and position
- Email address
- Telephone number
- Nationality at birth (passport)
- Passport number

The Registry User must also provide certain security information in case of lack of access for the person and contact information for the event the person is not responding to enquiries.

The Administrator may require additional verification documents to complete the verification of Account Representatives and Company Representatives, respectively. This information may include information to evidence the identity of the nominee, including but not limited to copies of identity card, passport, or other personal id, or an affidavit certified by a notary public.

Any evidence required might be supplied with scanned copies of originals, digitally certified copies, or, at the request of the Administrator, copies certified by a notary public. If the documents are not in English, and English translation may be requested by the Administrator.

Annex III | Information required to register an Off Registry Customer

When a Registry User Retires SMF-3 on Behalf of an Off Registry Customer, as set out in this Sec. 10 of this Manual, the Registry User must provide the following information about the entity receiving SMF-3:

- Entity name
- Entity address
- Entity registration number
- Country of incorporation
- Entity website (if any)
- Name of employee representing the Off Registry Customer
- Position of employee representing the Off Registry Customer
- Email address of employee representing the Off Registry Customer

Furthermore, the Registry User shall provide the following documentation:

- A copy of the outcome of the Registry User's most recent Know-Your-Customer checks of the Off Registry Customer, including any information and documents collected, verification steps performed and the result of the due diligence such as sanction screening results and risk assessments
- Any other confirmation, statement or documentation necessary to satisfy, in the sole discretion of the Administrator, the Administrator's 'Know-Your-Customer' (KYC) requirements for Off Registry Customers.

Annex IV | Data Requirements for Booking

The Shipping Company shall submit the Data Questionnaire file with all the data points included in table 2 along with three documents:

- Bunker delivery note of the SMF used during the Voyage.
- Proof of sustainability (POS)
- Statement of conformity from a third-party verifier according to Annex X

Table 2: Data required to Book an EAC

Data Category	Data Point	Units/options	Description
Katalist data	Registry user	N/A	Company name of the registry user booking the Voyage.
Katalist data	Registry Account ID	N/A	The unique ID number of the registry user's Registry Account.
Katalist data	Role of Registry User	Shipowner or ship operator	Role of the Shipping Company who is booking the Voyage.
Katalist data	Name of company who did not book the Voyage	N/A	Name of shipowner or ship operator who did not book the Voyage.
Vessel data	IMO No.	N/A	The IMO ship unique identification number.
Vessel data	Vessel Name	N/A	Vessel name.
Vessel data	Vessel Type	Bulk Carrier, Gas Carrier, Tanker, Container Ship, General Cargo Ship, Refrigerated Cargo Carrier, Combination Carrier, LNG Carrier, Ro-ro Cargo Ship (Vehicle Carrier), Ro-ro Cargo Ship, Ro-ro Passenger Ship, Cruise Passenger Ship, Service Vessels.	Vessel type as IMO classification.
Vessel data	Cargo capacity	N/A	The maximum cargo carrying capacity loaded to the ships summer loading mark (i.e. maximum allowable draught). Expressed in a real positive number.
Vessel data	Cargo capacity units	Metric ton, cubic meter, twenty-foot equivalent unit, number of passengers, car equivalent unit	The unit of the cargo capacity of the ship.
Vessel data	Unique Voyage ID	N/A	The unique Voyage ID used by the uploader in their internal monitoring systems.

Voyage data (leg)	Departure date	DD-MM-YYYY hh:mm	The UTC date and time of departure (last mooring line onboard) from its last terminal berth of cargo operation either loading or discharging.
Voyage data (leg)	Departure port name	N/A	Name of the departure port as per UN/ LOCODE.
Voyage data (leg)	Arrival date	DD-MM-YYYY hh:mm	The UTC date and time of arrival. All mooring lines fastened and prior to loading or discharging cargo.
Voyage data (leg)	Arrival port name	N/A	Name of the arrival port as per UN/ LOCODE.
Voyage data (leg)	Date leaving arrival port	DD-MM-YYYY hh:mm	The UTC date and time of departure from arrival port - same as the departure date for the subsequent leg.
Voyage data (leg)	Distance sailed	Nautical miles	Sailed distance (the great-circle distance) between departure and arrival port as logged by GPS (distance travelled over ground).
Voyage data (leg)	Fuel type	Standardized categories: Heavy fuel oil (HFO), Light fuel oil (LFO), Marine gas oil (MGO), Liquified natural gas (LNG), Ammonia, Methanol, Alternative fuel	The type of fuel oil consumed on the leg and the following cargo operation/port stay
Voyage data	Fuel consumption included[1]	At sea, At sea and at berth	Whether fuel consumption includes fuel consumed at sea only or both at sea and at berth.
Voyage data (leg)	Fuel consumption	Tonnes	All fuel consumed on board including but not limited to the fuel consumed by the main engines, auxiliary engines, gas turbines, boilers and inert gas generator, regardless of whether a ship is underway or not
Additionality Criteria	Amount of SMF used under EU ETS	Tonnes	The amount of Alternative Fuel used in the Voyage that was subject to EU ETS
Additionality Criteria	Amount of SMF used to comply with FuelEU	Tonnes	The amount of Alternative Fuel used in

			the Voyage that was used to comply with FuelEU, according to Annex XI.
Cargo data (leg)	Total Cargo Carried	N/A	Quantity of total cargo transported on the leg expressed as a real positive number.
Cargo data (leg)	Cargo unit	Metric ton, cubic meter, twenty-foot equivalent unit, number of passengers, car equivalent unit	The unit of what is carried onboard
Alternative fuel data	Is it a blend?	Yes / No	Indicator of whether the fuel used is a blend of two different types.
Alternative fuel data	Conventional fuel portion of blend	Heavy fuel oil (HFO), Light fuel oil (LFO), Marine gas oil (MGO), Liquified natural gas (LNG), Ammonia, Methanol	The name of the conventional fuel that is blended with alternative fuel
Alternative Fuel data	Alternative proportion of the blend	%	Weight of alternative fuel divided by the sum of the weight of alternative fuel and weight of conventional fuel it was blended with
Alternative fuel data[2]	Well-to-Tank emission factor excluding credits[3]	gCO_2e / MJ	The upstream energy based emission factor for fuel, excluding credits
Alternative fuel data[2]	Well-to-Tank emission factor including credits[3]	gCO_2e / MJ	The upstream energy based emission factor for fuel, including credits
Alternative fuel data[2]	Tank-to-Wake emission factors	gCO_2e / MJ	The downstream energy based emission factor for fuel
Alternative fuel data[2]	LCV	MJ / g fuel	Lower calorific value measures the released energy when a fuel is burnt
Alternative fuel data[2]	Type of feedstock	List of materials eligible for certification under EU RED	Standardized options to create a list of all key feedstock that is used to produce the fuel
Alternative fuel data[2]	Country of origin of feedstock	N/A	The Country in which the raw material is sourced from
Alternative fuel data[2]	Proof of sustainability number	N/A	Unique number of proof of sustainability
Alternative fuel data	Type of alternative fuel	Biodiesel, Bioethanol, Biogas / Biomethane, Biomethanol, Co- processed oil to be used for replacement of diesel, Co-processed oil to be used for replacement of marine fuel, Co-processed oil to be	The type of the alternative fuel that is used on the Voyage

		used for replacement of naphtha, Co-processed oil to be used for replacement of petrol, Co-processed oil to be used for replacement of jet fuel, Co-processed oil to be used for replacement of liquefied petroleum gas, Co-processed oil for the replacement of diesel/ petrol/jet fuel produced from biomethane, HVO - hydrotreated vegetable oil, Pure vegetable oil, Other	
Alternative fuel data[2]	Certification scheme	RSB EU RED, RSB global, ISCC EU, ISCC Plus	The certification scheme for the alternative fuel as per defined in the IMO's interim guidance on the use of biofuels under regulation 26, 27 and 28 of MARPOL Annex VI (DCS and CII)
Alternative fuel data[2]	Date of bunkering	DD-MM-YYYY	The UTC date of the bunkering event that include alternative fuels.
Alternative fuel data[2]	Amount of bunkered alternative fuel	Tonnes	The total amount of fuel bunkered. In the case of blends with conventional fuel, include the total mass of the blend.

1 - Fuel consumption at sea includes maneuvering away from berth and leaving port, sailing, maneuvering to anchorage, anchorage, and maneuvering to berth. Fuel consumption at sea and at berth includes all activities included at sea as well as activities when docked at berth.

2 - Alternative fuel data is for the Sustainable Maritime Fuel only – if the fuel is part of a blend these parameters should only be for the alternative portion of that blend.

3 - GHG emissions savings credits or bonuses refer to any downward adjustment embedded in a RED-certified lifecycle GHG emission factor displayed in the SMF's Proof of Sustainability (PoS), and calculated according to the relevant RED-recognized certification scheme, that is not solely attributable to the fuel's supply chain and combustion profiles.

Annex V | Data included in EACs

Below information is visible to the Registry User booking and receiving EACs

Table 3: EAC information visibility

Data category	Data point	Visible to Registry Users who Book?	Visible to Registry Users who receive a Transfer?
Katalist data	Registry user who booked Voyage	Yes	Yes
Katalist data	Registry Account ID	Yes	No
Katalist data	Role of Registry User who booked Voyage	Yes	Yes
Katalist data	Name of company who did not book the Voyage	Yes	No
Vessel data	IMO No.	Yes	Yes
Vessel data	Vessel name	Yes	Yes
Vessel data	Vessel type	Yes	Yes
Vessel data	Cargo capacity	Yes	Yes
Vessel data	Cargo capacity units	Yes	Yes
Vessel data	Unique Voyage ID	Yes	No
Voyage data (leg)	Departure date	Yes	Yes (First leg)
Voyage data (leg)	Departure port name	Yes	Yes (First leg)
Voyage data (leg)	Arrival date	Yes	Yes (Last leg)
Voyage data (leg)	Arrival port name	Yes	Yes (Last leg)
Voyage data (leg)	Date leaving arrival port	Yes	No
Voyage data (leg)	Distance sailed	Yes	No
Voyage data (leg)	Fuel type	Yes	Yes (SMF only)
Voyage data (leg)	Fuel consumption	Yes	No (SMF only - for amount transferred)
Voyage data	Fuel consumption includes at sea or at sea and at berth	Yes	Yes
Additionality Criteria	Amount of SMF used under EU ETS	Yes	Yes
Additionality Criteria	Amount of SMF used to comply with FuelEU	Yes	No (Comp EACs cannot be Transferred or Retired on Behalf)
Cargo data (leg)	Total cargo carried	Yes	No

Cargo data (leg)	Cargo unit	Yes	Yes
Alternative fuel data	Is it a blend?	Yes	Yes
Alternative fuel data	Conventional fuel portion of blend	Yes	Yes
Alternative fuel data	Type of alternative fuel	Yes	Yes
Alternative fuel data	Alternative proportion of the blend	Yes	Yes
Alternative fuel data	Well-to-Tank emission factor excluding credits	Yes	Yes
Alternative fuel data	Well-to-Tank emission factor including credits	Yes	Yes
Alternative fuel data	Tank-to-Wake emission factors	Yes	Yes
Alternative fuel data	LCV	Yes	Yes
Alternative fuel data	Type of feedstock	Yes	Yes
Alternative fuel data	Country of origin of feedstock	Yes	Yes
Alternative fuel data	Proof of sustainability number	Yes	Yes
Alternative fuel data	Certification scheme	Yes	Yes
Alternative fuel data	Date of bunkering	Yes	No
Alternative fuel data	Amount of bunkered alternative fuel	Yes	No
Katalist calculations	Remaining vintage period	Yes	Yes
Katalist calculations[1]	Fuel quantity consumed (SMF)	Yes	Yes
Katalist calculations[1]	Fuel quantity consumed (Voyage[2])	Yes	Yes (if selected by SCA)
Katalist calculations[1]	Absolute GHG emissions (SMF)	Yes	Yes
Katalist calculations[1]	Absolute GHG emissions (Voyage[2])	Yes	Yes (if selected by SCA)
Katalist calculations[1]	GHG emission savings	Yes	Yes
Katalist calculations[1]	GHG emission savings percentage	Yes	Yes
Katalist calculations[1]	Transport work (SMF)	Yes	Yes (if selected by SCA)
Katalist calculations[1]	Transport work (Voyage[2])	Yes	Yes (if selected by SCA)
Katalist calculations	Fossil Baseline of Reference	Yes	Yes
Katalist calculations	GHG Emission Intensity (Fossil Baseline of Reference)	Yes	Yes
Katalist calculations	GHG emission intensity (SMF)	Yes	Yes

1 - This information only relates to the share of SMF-3 received. For example, if 1 SMF-3 has 1,000,000 Tonne-miles of transport work and 0.5 SMF-3 are transferred, only 500,000 Tonne-miles of transport work would be included in the transfer.

2 - Voyage metrics refer to both the SMF and fossil fuels consumed, see Annex IX, Sec 6.

Annex VI | Retirement Statement

Upon retiring SMF-3, Registry Users can export a PDF file with the below information, as per Table 4.

Table 4: Data included in Retirement Statement

Data Point	Units/options
SMF-3 ID	N/A
Voyage date	DD-MM-YYYY
Date of booking	DD-MM-YYYY
Date of Retirement	DD-MM-YYYY
Name of organization retiring SMF-3	N/A
Role of organization retiring SMF-3	Shipping Company, Freight Forwarder, Cargo Owner
Amount of SMF Retired	Tonnes
Type of SMF Retired	Biodiesel, Bioethanol, Biogas / Biomethane, Biomethanol, Co-processed oil to be used for replacement of diesel, Co-processed oil to be used for replacement of marine fuel, Co-processed oil to be used for replacement of naphtha, Co-processed oil to be used for replacement of petrol, Co-processed oil to be used for replacement of jet fuel, Co-processed oil to be used for replacement of liquefied petroleum gas, Co-processed oil for the replacement of diesel/petrol/ jet fuel produced from biomethane, HVO - hydrotreated vegetable oil, Pure vegetable oil, Other
Are credits included[1]	Yes/No
Total GHG savings	Tonnes CO_2e
Total GHG savings	%
Fossil Baseline of Reference Type	Heavy fuel oil (HFO), Light fuel oil (LFO), Marine gas oil (MGO), Liquified natural gas (LNG), Ammonia, Methanol
Type of ship	Bulk Carrier, Gas carrier, Tanker, Container ship, General cargo ship, Refrigerated cargo carrier, Combination Carrier, LNG Carrier, Ro-ro Cargo Ship (vehicle carrier), Ro-ro cargo ship, Ro-ro passenger ship, Cruise passenger ship

Departure port name	N/A
Arrival port name	N/A
Transport work - SMF or Voyage[2] (if selected by SCA)	Cargo unit – nautical miles
Transport work emission intensity - SMF or Voyage[2] (if selected by SCA)	g CO_2eq per cargo unit – nautical miles
Emission scope	Scope 3
Fuel consumption included	At sea, At sea and at berth
Calendar year in which retirement will apply	N/A
Vintage Period	DD-MM-YYYY
SMF emission intensity	g CO_2eq / MJ
Amount of SMF-3 Retired	N/A
Absolute GHG emissions of SMF	Tonnes CO_2eq
Certification scheme of SMF	RSB EU RED, RSB global, ISCC EU, ISCC Plus
Proof of sustainability number	N/A
LCV of SMF	MJ / g fuel
Type of feedstock	N/A
Country of origin of feedstock	N/A
Fossil Baseline of Reference emission intensity	g CO_2eq / MJ
Uploader name	N/A
IMO number	N/A
Vessel name	N/A
Comment included when receiving SMF-3	N/A

1 - GHG emissions savings credits or bonuses refer to any downward adjustment embedded in a RED-certified lifecycle GHG emission factor displayed in the SMF's Proof of Sustainability (PoS), and calculated according to the relevant RED-recognized certification scheme, that is not solely attributable to the fuel's supply chain and combustion profiles.

2 - Voyage metrics refer to both the SMF and fossil fuels consumed, see Annex IX, Sec 6.

Annex VII | Public Retirement Table

Upon Retirement on a COA or a Retirement on Behalf of an Off Registry Customer, the Registry updates a public database available on its website, showing selected data points, as per Table 5.

Table 5: Public retirement table

Data Point	Units/options
Block Unit ID	Text
Date of retirement	Day – Month – Year
Type of vessel	As per IMO classification
Type of fuel	Type of SMF as per Data Questionnaire
Quantity of SMF-3	Number
Emission intensity of SMF-3	gCO_2eq/MJ
Fossil Baseline of Reference	gCO_2eq/MJ
Total GHG savings	Tonnes CO_2eq
SMF certification scheme	Name
Freight Forwarder Account who retired SMF-3 (if selected)	Name
Cargo Owner Account who retired SMF-3 (if selected)	Name
Name of Off Registry Customer (if selected)	Name

Annex VIII | Fossil Baseline of Reference

The Fossil Baseline of Reference that the Registry uses to calculate GHG emission savings, GHG emissions for blends, and transport work allocation is based on FuelEU emission factors as shown in Table 6.

The supporting calculations for these Well-to-Wake emission factors can be found in the "Katalist Fossil Baseline of Reference" document available on the Registry Site. Note that for all numbers in the Registry, a period denotes a decimal point and a comma separates thousands.

Table 6: Fossil Baseline of Reference parameters

Fuel type	WtW CO_2eq/MJ
HFO	91.601
LFO	91.251
MGO	90.632
LNG otto medium speed	91.025
LNG otto slow speed	83.834
LNG diesel slow speed	76.129
LNG Lean-burn spark ignited (LBSI)	88.457
LNG Boiler	75.102
Ammonia	123.565
Methanol	102.863

The GHG emissions factor can be calculated as the emissions of CO_2, CH_4 and N_2O combined into CO_2- equivalent emissions using global warming potential. The global warming potential of non-CO_2 emissions depends on the lifetime, and Katalist uses a lifetime of 100 years based on the Intergovernmental Panel on Climate Change's Fifth Assessment Report (IPCC AR5). The calculation is as follows:

$$EF_{GHG} = EF_{CO_2} \cdot GWP_{CO_2} + EF_{CH_4} \cdot GWP_{CH_4} + EF_{N_2O} \cdot GWP_{N_2O}$$

Where the emissions factors are noted as EF and global warming potential noted as GWP. The subscript defines which emission is considered (e.g., for EF_GHG it is the GHG emissions in CO_2 equivalents).

An example calculation is the Tank-to-Wake (TTW) emissions factor for heavy fuel oil (HFO). The emissions factors and global warming potentials for HFO are summarized in Table 7.

Table 7: HFO emission factors and GWP

Item	Value	Unit
$EF_{CO_2}^{HFO}$	76.889	gCO_2/MJ fuel
$EF_{CH_4}^{HFO}$	0.00123	gCH_4/MJ fuel
$EF_{N_2O}^{HFO}$	0.00444	gN_2O/MJ fuel
GWP_{CO_2}	1	gCO_2eq/gCO_2
GWP_{CH_4}	28	gCO_2eq/gCH_4
GWP_{N_2O}	265	gCO_2eq/gN_2O

Using these values for the calculation gives the following:

$$EF_{GHG}^{HFO} = 76.889\frac{gCO_2}{MJ}\cdot 1\frac{gCO_2eq}{gCO_2} + 0.00123\frac{gCH_4}{MJ}\cdot 28\frac{gCO_2eq}{gCH_4} + 0.00444\frac{gN_2O}{MJ} \cdot 265\frac{gCO_2eq}{gN_2O} = 78.101\frac{gCO_2eq}{MJ}$$

The TTW emissions factor for HFO is thus calculated as 78.101 gCO_2eq/MJ. The WTT emission factor is 13.500 gCO_2eq/MJ. The calculation for WtW emission factor is thus:

$$EF_{WTW}^{HFO} = 78.101\frac{gCO_2eq}{MJ} + 13.500\frac{gCO_2eq}{MJ} = 91.601\ \frac{gCO_2eq}{MJ}$$

Annex IX | Registry Calculations

Note that for all numbers in the Registry, a period denotes a decimal point and a comma separates thousands.

1. Energy Calculations

1.1. Converting mass (Tonnes) to energy (TJ)

A conversion from mass of fuel (usually noted in tonnes) to energy (usually noted in megajoules – MJ) is required to enable a comparison across different fuel types. With the introduction of new types of fuels, the energy content per mass (Lower Calorific Value – LCV) will differ significantly between current fossil fuel oils and e.g., ammonia, methanol and methane.

Data points in the Katalist Data Questionnaire shall be in the following units:

- $LCV = \frac{MJ}{Fuel_g}$
- $Mass\ (M) = Tonnes$
- [For blended fuel only] Alternative proportion of the blend: $\left(\frac{SMF_{Tonnes}}{Blend_{Tonnes}}\right)$

The Registry will automatically calculate from mass (tonnes) to energy (MJ) using the LCV using the equation:

- $E = LCV * M$

Where E is the energy, LCV is the lower calorific value and M is the mass. This is then converted to different units as follows:

- $Fuel_{grams} = Fuel_{Tonnes} * 1{,}000{,}000$
- $MJ = Fuel_g * LCV$
- $TJ = \frac{MJ}{1{,}000{,}000}$

Total Fuel Consumption (in TJ) across all fuel types and Voyage legs is calculated by summing the individual TJ values for each fuel used.

1.2. Blended Fuels

When SMF is used as part of a blend with fossil fuels, each fuel must be converted from mass to energy separately to allow the correct energy-based emission calculation. Blended fuels refer to fuels that are blended physically prior to being bunkered.

Split total blended fuel mass into SMF and fossil fuel proportions

- $SMF_{Tonnes} = Blend_{Tonnes} * SMF_{share}$

Where:

- $Blend_{Tonnes} = Total\ mass\ of\ the\ blended\ fuel$
- $SMF_{share} = Proportion\ of\ SMF\ in\ the\ blend\ [0\% - 100\%]$

Convert mass to grams

- $SMF_g = SMF_{Tonnes} * 1{,}000{,}000$
- $Fossil_g = Fossil_{Tonnes} * 1{,}000{,}000$

Convert to energy using each fuel's LCV

- $SMF_{MJ} = SMF_g * LCV_{SMF}$
- $Fossil_{MJ} = Fossil_g * LCV_{Fossil}$

Convert to TJ

- $SMF_{TJ} = \frac{SMF_{MJ}}{1{,}000{,}000}$
- $Fossil_{TJ} = \frac{Fossil_{MJ}}{1{,}000{,}000}$

Total energy of the blended fuel

- $Blend_{TJ} = SMF_{TJ} + Fossil_{TJ}$

2. GHG emission factor calculations

2.1. Overall guidance on WtW calculations

GHG emission factors in the Katalist Data Questionnaire shall be in the following units: gCO_2eq/MJ. The Well-to-Wake (WtW) GHG emission factors is the sum of the Well-to-Tank (WTT) emission factors and the Tank-to-Wake (TTW) emission factors (EF).

- $EF_{WtW} = EF_{WtT} + EF_{TtW}$

In the case when SMF is part of a blend with a fossil fuel, the GHG emission factor will be calculated as per IMO's guidance published in July 2023, which states: "For blends, the Cf [GHG emission factor] should be based on the weighted average of the Cf [GHG emission factor] for the respective amount of fuels by energy." The GHG emission factor used for the conventional fuel portion of a blend will be based on the reference fossil fuel data in Annex VIII, regardless of any supplier-specific data.

Example: A blend consists of heavy fuel oil (HFO) and a certified sustainable fuel. The WtW emissions factor of the certified sustainable fuel is 10.000 gCO_2eq/MJ and the emissions factor for HFO is 91.601 gCO_2eq/MJ. The energy split between these fuels, as calculated in Annex IX, Sec. 1, is 80% HFO and 20% SMF. The emissions factor for the blend is calculated as follows:

- $EF_{blend} = 80\% \times 91.601 \frac{gCO_2eq}{MJ} + 20\% \times 10.000 \frac{gCO_2eq}{MJ} = 75.281 \frac{gCO_2eq}{MJ}$

In this example, the emissions factor for this fuel is 75.281 gCO_2eq/MJ.

2.2. WtT Calculations for SMF

While the Proof of Sustainability (PoS) provides a lifecycle emission value, this value often requires adjustment to align with FuelEU-compliant WtW calculations. To calculate WtT, the following documentation and data are required:

- Proof of Sustainability (PoS) – The PoS contains the E-value (gCO_2eq/MJ) which may or may not include emissions from non-CO_2 combustion gases (CH_4 and N_2O).
- FuelEU default emission factors – The FuelEU Annex II provides default CO_2 emission factors from combustion ($CfCO_2$, gCO_2/MJ) for each fuel type. These represent the Tank-to-Wake CO_2 emissions.
- Lower Calorific Value (LCV) – the LCV (MJ/g) is required to convert fuel mass or volume into energy units for calculation of emission factors.

The PoS E-value represents the upstream emissions associated with production, and distribution, but it also includes or excludes certain combustion elements depending on the certification scheme. To align with FuelEU's WtW methodology, the upstream WtT component must be isolated from this combined value as PoS methodologies generally do not include CH_4, N_2O or methane slip.

The Well-to-Tank emissions factor is calculated using the following formula:

- $EF_{WtT} = E - \frac{C_f CO_2}{LCV}$

Where:

- EF_{WtT} = Well-to-Tank emission Factor (gCO_2eq/MJ)
- $C_f CO_2$ = CO_2 emission factor from fuel combustion (gCO_2/MJ or $gCO_2/gfuel$)
- LCV = Lower calorific value of the fuel (MJ/g)
- E = Lifecycle value reported in PoS (gCO_2eq/MJ)

Example: Calculating WtT using B100

- E-value (PoS): $15\ gCO_2eq/MJ$
- CO_2 combustion factor $(C_f CO_2)$: $2.83\ gCO_2/gfuel$
- LCV: $0.037\ MJ/g$
- $EF_{WtT} = 15 - \left(\frac{2.834}{0.037}\right)$
- $EF_{WtT} = 15 - 76.59 = -61.59\ gCO_2eq/MJ$

The WtT for SMF can sometimes include credits or bonuses. GHG emissions savings credits or bonuses refer to any downward adjustment embedded in a RED-certified

lifecycle GHG emission factor displayed in the SMF's Proof of Sustainability (PoS), and calculated according to the relevant RED-recognized certification scheme, that is not solely attributable to the fuel's supply chain and combustion profiles. Because these adjustments may reflect consequential or intervention-based accounting elements rather than purely attributional fuel-pathway emissions, shipping companies shall disclose them separately to improve transparency regarding their contribution to the certified emission factor and the resulting emissions savings recorded in Katalist.

WtT excluding and including credits is included in the data questionnaire and will be displayed in EAC data within the registry. Shipping companies have the option to include or exclude these credits in KPIs calculations at the point of transfer, assignment, or retirement on behalf.

2.3. TtW Calculations for SMF

Once the WtT component has been calculated, the Tank-to-Wake (TtW) emissions are calculated.

Methane slip for gaseous fuels must also be included methane slip and non-CO_2 emission must be converted to CO_2-equivalents using global warming potential (GWP) values. Katalist uses IPCC AR5 GWP potentials as listed below.

- $GWP_{CH_4} = 28$
- $GWP_{N_2O} = 265$

The formula to calculate TtW, is:

- $EF_{TtW} = (1 - \frac{C_{slip}}{100}) \times (C_f CO_2 \times GWP_{CO_2} + C_f CH_4 \times GWP_{CH_4} + C_f N_2O \times GWP_{N_2O})/ LCV + \frac{C_{slip}}{100} \times (C_f CH_4 \times GWP_{CH_4})/LCV$

Where:

- EF_{TtW} = Tank-to-Wake emission Factor (gCO_2eq/MJ)
- $C_f CO_2$ = CO_2 emission factor from fuel combustion (gCO_2/MJ or $gCO_2/gfuel$)
- $C_f CH_4$ = CH_4 emission factor from fuel combustion (gCH_4/MJ or $gCH_4/gfuel$)
- $C_f N_2O$ = N_2O emission factor from fuel combustion (gN_2O/MJ or $gN_2O/gfuel$)
- GWP= Global warming potential for non-CO_2 emissions
- LCV = Lower calorific value of the fuel (MJ/g)
- C_{slip}= Non-combusted fuel that escapes as fugitive or engine slip emissions as percentage of mass of the fused consumed

Example: Calculating TtW using B100 without any methane slip.

- $EF_{TtW} = (1 - \frac{C_{slip}}{100}) \times (C_f CO_2 \times GWP_{CO_2} + C_f CH_4 \times GWP_{CH_4} + C_f N_2O \times GWP_{N_2O})/ LCV + \frac{C_{slip}}{100} \times (C_f CH_4 \times GWP_{CH_4})/LCV$
- $EF_{TtW} = (1) \times (2.83 \times 1 + 0.0005 \times 28 + 0.00018 \times 265)/0.037 + 0 \times (0.0005 \times 28)/0037$
- $EF_{TtW} = 77.92\ gCO_2eq/MJ$

2.4. Well-to-Wake (WtW) Calculation for SMF

Once both components have been calculated, the full lifecycle intensity is obtained as:

- $EF_{WtW} = EF_{WtT} + EF_{TtW}$

Using example from above sections, the WtW = 16.33 gCO_2eq/MJ

- $EF_{WtW} = -61.59 gCO_2eq/MJ + 77.92 gCO_2eq/MJ = 16.33 gCO_2eq/MJ$

3. Absolute GHG emission calculation

The Registry will automatically calculate the GHG emissions for SMF based on its GHG emission factors. The GHG emission factor is converted to tonnes CO_2eq/TJ, which is the same as the GHG emission factor as 1 gram = 10^{-6} tonnes and 1 MJ = 10^{-6} TJ. To calculate absolute GHG emissions, the number of EACs should be multiplied by the GHG emission factor of the EAC.

- $GHG\ Emissions\ (Tonnes\ CO_2eq) = EF_{EAC}\ \frac{Tonnes\ CO_2eq}{TJ} * EAC\ Energy\ (TJ)$

Example 1: 2.5 EACs with a GHG emission factor of 75.281 gCO_2eq/MJ have absolute GHG emissions of 188.203 tonnes CO_2eq

- $75.281 \frac{gCO_2eq}{MJ} * \frac{10^{-6}\left(\frac{Tonnes\ CO_2eq}{gCO_2eq}\right)}{10^{-6}\left(\frac{TJ}{MJ}\right)} = 75.281 \frac{Tonnes\ CO_2eq}{TJ} * 2.500\ TJ = 188.203\ Tonnes\ CO_2eq$

Example 2: A vessel consumes SMF and fossil fuel with below parameters.

Fuel	Energy (TJ)	WTW EF (gCO_2eq/MJ)	Converted EF (MT CO_2eq/TJ)	Emissions (Tonnes CO_2eq)
SMF	2.0	10.000	10.000	20.000
HFO	6.0	91.601	91.601	549.606

Emissions = $20.000 + 549.606 = 569.606\ Tonnes\ CO_2eq$

4. GHG emission intensity

The GHG emission intensity for an SMF is calculated as per Annex IX, Sec. 2. To calculate the GHG emission intensity for a Voyage, the total emissions for that Voyage are divided by the total energy, including both fossil fuels and SMF.

Based on example 2 above, the GHG emission intensity of this Voyage is 71.201 gCO_2eq/MJ.

- $\frac{HFO_{emissions}+SMF_{emissions}}{HFO_{energy}+SMF_{energy}} = \frac{549.606\ Tonnes\ CO_2e+20.000\ Tonnes\ CO_2e}{6.0\ TJ+2.0TJ} = \frac{569.606\ tonnes}{8.0\ TJ} = 71.201\ gCO_2eq/MJ$

5. Calculating GHG emission savings

The Registry will automatically calculate the GHG emission savings for SMF based on its GHG emission factors and the GHG emission factors for the fossil baseline of reference selected (see Annex VIII), using the following steps:

1) The GHG savings is calculated
- $EF_{Fossil\ baseline\ of\ reference} - EF_{SMF} = EF_{GHG\ savings}$

2) This GHG emissions savings is converted into savings in tonnes/TJ, using same logic applied in previous example.
- $EF_{GHG\ savings} * \frac{10^{-6}\left(\frac{Tonnes\ CO_2eq}{gCO_2eq}\right)}{10^{-6}\left(\frac{TJ}{MJ}\right)} = \frac{10^{-6}\ Tonnes\ CO_2eq}{10^{-6}\ TJ} = \frac{EF_{GHG\ savings}\ Tonnes\ CO_2eq}{TJ}$

Note:

- GHG emission savings are only calculated for SMF
- Fossil fuels do not generate GHG savings and are therefore not included in the savings calculation, as Katalist does not include savings from switching between different fossil fuels.

Example: Calculating GHG Emission Savings

A blend consists of heavy fuel oil (HFO) and a certified sustainable fuel with a combined GHG emission factor of 75.281 gCO_2eq/MJ, generating 2.500 EACs. A fossil baseline of reference of HFO is selected upon transfer, with a GHG emission factor of 91.601 gCO_2eq/MJ.

Tonnes of GHG emission savings for one EAC: 16.320 tonnes CO_2eq savings

- $91.601\ gCO_2eq - 75.281\ gCO_2eq = 16.320\ \frac{gCO_2eq}{MJ}$
- $16.320\ \frac{gCO_2eq}{MJ} * \frac{10^{-6}\left(\frac{Tonnes\ CO_2eq}{gCO_2eq}\right)}{10^{-6}\left(\frac{TJ}{MJ}\right)} = \frac{10^{-6}Tonnes\ CO_2eq}{10^{-6}TJ} = 16.320\ \frac{Tonnes\ CO_2eq}{TJ} * 1TJ = 16.320\ Tonnes\ CO_2eq\ savings$

Total tonnes of GHG emission savings for the 2.500 EACs: 40.800 tonnes CO_2eq savings

- $16.320\,\frac{gCO_2eq}{MJ} * \frac{10^{-6}\left(\frac{Tonnes\ CO_2eq}{gCO_2eq}\right)}{10^{-6}\left(\frac{TJ}{MJ}\right)} = \frac{10^{-6}Tonnes\ CO_2eq}{10^{-6}TJ} = 16.320\,\frac{Tonnes\ CO_2eq}{TJ} *$ $2.500TJ = 40.800\ Tonnes\ CO_2eq\ savings$

6. Transport Work calculations

The Registry will automatically calculate transport work both for the SMF used on a Voyage and also for the entire Voyage. The difference between these two calculations is whether the fossil fuel used in the Voyage is included in calculations. When selecting whether to include transport work KPIs, see Sec. 8.3, SCAs can transfer 1) only the SMF transport work KPIs, 2) the Voyage and SMF transport work KPIs, or 3) no transport work KPIs.

6.1. Transport Work

Transport work is calculated by multiplying the distance travelled by the cargo carried and can be expressed in different units depending on the cargo type transported (e.g. TEU, tonnes, CMB)

- $Transport\ Work = Distance\ Travelled * Cargo\ Carried$

Total transport work for a Voyage is calculated by summing the transport work for each leg. All transport work for a Voyage is included in this calculation, including the transport work done using fossil fuels on the Voyage.

- $Total\ Transport\ Work\ Voyage = Transport\ Work_{Leg\ 1} + Transport\ Work_{Leg\ 2} + \cdots Transport\ Work_{Leg\ x}$

The total energy consumption from fuel used on a Voyage, including fossil fuel and any fuel used on ballast legs is then calculated in TJ, as per Annex IX, Sec. 1.

- $Total\ Energy\ Consumption = Energy\ Consumption_{Leg\ 1} + Energy\ Consumption_{Leg\ 2} + \cdots Energy\ Consumption_{Leg\ x}$

The total transport work is then divided by total energy consumption to get the transport work per energy consumption.

- $Total\ Work\ per\ Energy\ Consumption = \frac{Total\ Transport\ Work}{Total\ Energy\ Consumption}$

Example: The below Voyage is booked – consisting of three legs with two fuel types used (SMF and fossil fuel).

Table 8: Example of calculation of energy consumption and transport work

	Distance travelled (nm)	Cargo Carried (TEU)	SMF (TJ)	Fossil Fuel (TJ)
Leg 1	250	-	-	2.000
Leg 2	250	5,000	2.500	-
Leg 3	250	5,000	-	2.500

Voyage transport work is 2,500,000 TEU-nm as per below

- $Voyage\ \ Transport\ Work = (250\ mm + 0\ TEU) + (250\ nm * 5{,}000\ TEU) + (250\ nm * 5{,}000\ TEU) = 2{,}500{,}000\ TEU\ nm$

SMF transport work is 892,857 TEU-nm as per below

- $Voyage\ \ Transport\ Work = (250\ mm + 0\ TEU) + (250\ nm * 5{,}000\ TEU) + (250\ nm * 5{,}000\ TEU) = 2{,}500{,}000\ TEU\ nm$
- $Voyage\ Energy\ Consumption = 2.000\ TJ + 2.500\ TJ + 2.500\ TJ = 7.000\ TJ$
- $SMF\ Share\ of\ Energy\ Consumption = \frac{2.500}{7.000} = 35.714\%$
- $SMF\ Transport\ Work = 2{,}500{,}000\ TEU\ nm * 35.714\% = 892{,}857\ TEU\ nm$

6.2. Transport Work intensity

Transport work intensity is a measure of emissions efficiency in transportation. It quantifies the amount of CO_2-equivalent (CO_2eq) emissions produced per unit of transport work performed.

Transport work intensity is calculated as follows:

- $Transport\ work\ intensity = \frac{CO_2eq\ Emitted}{Transport\ Work}$

where:

- CO_2eq Emitted represents the total CO_2-equivalent emissions in tonnes as per Sec. 3 of this Annex.
- Transport Work is the transport work performed, calculated as the product of the cargo carried and the distance travelled, as per Sec 5.1 of this Annex.

Example, the Voyage from Table 8 is used with GHG emissions shown below and same energy split and transport work split as per the example in Sec 5.1 of this Annex.

Table 9 -Example of calculation of transport work intensity

	Distance travelled (nm)	Cargo Carried (TEU)	SMF (tonnes CO_2eq)	Fossil Fuel (tonnes CO_2eq)
Leg 1	250	-	-	180.000
Leg 2	250	5,000	25.000	-
Leg 3	250	5,000	-	225.000

Voyage transport work intensity is $172\ \frac{gCO_2eq}{TEU\ nm}$ as shown below

- $Voyage\ Transport\ Work\ Intensity = \frac{180+25+225}{2{,}500{,}000} = 0.000172\ \frac{Tonnes\ CO_2eq}{TEU\ nm}$ or $172\ \frac{gCO_2eq}{TEU\ nm}$

SMF transport work intensity is $28\ \frac{gCO_2eq}{TEU\ nm}$ as shown below.

- $SMF\ Transport\ Work\ Intensity = \frac{25}{892{,}857} = 0.000028\ \frac{Tonnes\ CO_2eq}{TEU\ nm}$ or $28\ \frac{gCO_2eq}{TEU\ nm}$

6.3. Transport Work efficiency

Transport Work Efficiency is calculated as follows:

- $Transport\ Work\ Efficiency = \frac{Fuel_g\ Consumed}{Transport\ Work}$

where:

- $Fuel_g$ consumed represents the total fuel consumption expressed in grams.
- Transport Work is the transport work performed, calculated as the product of the cargo carried and the distance travelled, as per Sec 5.1 of this Annex.

Example, the Voyage from Table 8 and 9 is used with fuel consumption in grams shown below and same energy split and transport work split as per the example in Sec 5.1 of this Annex.

	Distance travelled (nm)	Cargo Carried (TEU)	SMF (Tonnes)	Fossil Fuel (Tonnes)
Leg 1	250	-	-	10
Leg 2	250	5,000	10	-
Leg 3	250	5,000	-	15

Voyage transport work efficiency is $14\frac{gfuel}{TEU\ nm}$ as shown below

- $Voyage\ Transport\ Work\ efficiency = \frac{10+10+15}{2{,}500{,}000} = 0.000014\ \frac{Tonnes\ fuel}{TEU\ nm}$ or $14\frac{gfuel}{TEU\ nm}$

SMF transport work efficiency is $28\frac{gfuel}{TEU\ nm}$ as shown below.

- $SMF\ Transport\ Work\ efficiency = \frac{10}{892{,}857} = 0.0000112\ \frac{Tonnes\ fuel}{TEU\ nm}$ or $11\frac{gfuel}{TEU\ nm}$

7. Vintage period

Vintage periods define the allowable timeframes for completing specific EAC-related actions in the registry. These constraints ensure temporal integrity and traceability of emissions claims in relation to the underlying transport activity.

Example calculation:

- Voyage Completed: April 15, 2022
- End of Year Date: December 31, 2022

Action	Constraint	Base Date	Months	Deadline
SCA Books	Voyage End	April 15, 2022	24	April 15, 2024
SCA Transfers to FFA	Voyage End	April 15, 2022	24	April 15, 2024
FFA Retires	Voyage End	April 15, 2022	24	April 15, 2024
FFA Transfers to COA	End of Year	December 31, 2022	48	December 31, 2026
COA Retires (from FFA)	End of Year	December 31, 2022	48	December 31, 2026
SCA Transfers to COA	End of Year	December 31, 2022	36	December 31, 2025
COA Retires (from SCA)	End of Year	December 31, 2022	36	December 31, 2025

Once a vintage period expires for a given action, that action is no longer valid in within the registry. Downstream actions (e.g., retirement) are invalidated if any upstream action exceeds its vintage limit.

Annex X | Verification and Validation of Registry Data

As detailed in Sec. 7, all the information contained in Annex IV for Voyages that shipping companies wish to Book in the Registry must be verified by third-party organizations with the expertise to perform such verification services. These organizations shall determine, with reasonable assurance, to what extent information provided by shipping companies is accurate and free from misreporting or discrepancies from expected values or industry averages for a similar Voyage. To do so, third-party verifiers should evaluate the completeness and sufficiency of the data provided by shipping companies; compare data provided with third-party data sources and proprietary models; and determine with reasonable assurance if the data accurately reflects the characteristics and conditions of the Voyage. A supplemental document called “Third Party Verification - Requirements for verification of fuel consumption & transport activity” consolidates the definitions, activities, criteria, and general requirements for verifiers. It also outlines the minimum information that must be included in the statement of conformity.

In addition, there is a supplemental document describing the procedures that Administrator must follow to fulfill its responsibilities, as defined in Sec. 15. These responsibilities include the Registry’s actions in Sec. 5 related to Account management and Sec. 7 to 14 concerning EAC Booking, Transferring, Assigning/Unassigning, Retirement, and status changes. Furthermore, the Registry will perform additional and automatic validations according to the rules established in these Sections. Due to the multiyear extension of the vintage period and the timeline for complying with regulatory requirements, Administrator will perform further validations after a EAC is booked to ensure the accuracy of the information reported in the Data Questionnaire, including additionality requirements.

Annex XI | Additionality Criteria

Additionality generally is defined within Katalist as a criterion for assessing whether the use of SMF was required by regulation. The concept of additionality is not new and intends to ensure that any environmental benefits claimed by a project, or an intervention are truly additional and would not have occurred without the project or intervention. This is crucial for maintaining the integrity and credibility of voluntary actions.

Katalist adopts in full the additionality guidance stated in the paper entitled "Defining additionality in the voluntary book and claim market in deep-sea shipping", developed by the Global Maritime Forum in collaboration with organizations involved in the book and claim ecosystem. The paper considers three maritime regulations: the EU Emission Trading System (EU ETS) Regulation and Carbon Intensity Indicator (CII) regulation.

While the detailed position on additionality and rationale can be found in the paper, for the implementation and usage of the registry, the following guidance need to be followed to ensure all additionality constraints are met.

EU ETS Position: The use of SMF by a carrier on a Voyage subject to EU ETS is considered additional, as long as shipping companies follow one of the two options below.

Option 1 **Provide transparency on EU Allowances (EUAs) avoided from SMF use**	**Option 2** **Cancel EUAs avoided from SMF use**
The Shipping Company will provide transparency on the amount of EUAs avoided from use of the booked SMF.	The buyer can request the seller to cancel the EUAs avoided by use of this SMF.
Implementation in the registry	
This information will be displayed as amount of SMF, in tonnes, burned under the scope of EU ETS. The seller and/or buyer can use this information to determine the amount of EUAs that have been avoided (i.e. not purchased by the seller).	This transaction and verification takes place outside the registry and is the responsibility of the seller and buyer.

FuelEU Maritime position: The use of SMF towards compliance with FuelEU is not additional, including fuel that is pooled, banked for future compliance with the regulation, or used to cancel borrowed deficit from previous years. SMF that is not used towards compliance with FuelEU is considered additional and may be sold in the voluntary market. There are two options for proving additionality depending on the timing of the booking process.

Option 1 Voyage booked before end of the verification process	Option 2 Voyage book after end of verification process
Throughout the reporting period in a given year (i.e. before the end of the FuelEU verification period for that given year), low-emission fuel may be booked and claimed in the voluntary market on the condition that the shipping company booking the fuel provides documentation proving that it has not and will not be used by the FuelEU DOC holder (ISM company) towards compliance. Such documentation should be audited by an external verifier.	Another equally acceptable option is to wait until the end of the FuelEU verification period. In this case, the issuance of all relevant verified documentation will prove that the low-emission fuel was not used by the FuelEU DOC holder in its compliance balance or banked with the intent to use for future compliance. This provides the buyer with transparency and ensures that the volumes sold on the voluntary market are additional. It should be noted that in this scenario, such fuel volumes can only be booked in the voluntary market six to 18 months after the intervention (depending on when the intervention took place within the reporting year).
Implementation in the registry	
The shipping company must provide a statement to the registry upon booking from ISM company/DOC holder stating that fuel will not be used for compliance. Additionally, at end of verification period the shipping company must provide confirmation to the registry from the vessel (if not pooled) or pool verifier (if pooled) that the fuel wasn't used for compliance or banked by providing the pooling report of the respective vessel.	The shipping company must provide confirmation to the registry from the vessel verifier (if not pooled) or pool verifier (if pooled) that the fuel wasn't used for compliance (i.e. not pooled or banked) by providing relevant supporting documentation.

IMO CII position: In its current form, the CII regulation imposes no concerns or restrictions concerning additionality.

Annex XII | Double Counting Guidelines

In general terms, double counting happens when two different organizations claim the same environmental attributes. It is important to clarify that not all double counting is the same, and thus it does not have the same effect on the Registry's outputs. Furthermore, Scope 3 emissions are, in fact, double counted multiple times by different organizations through a supply chain, upstream and downstream. The more complicated a supply chain is, the more times the same specific emissions are counted as Scope 3 emissions in organizations' emission inventories. The table below introduces definitions for different types of double counting that could occur within or outside the Registry.

Table 10: Type of double counting

Type of double counting	Description	Example	Control
Double booking	Occurs when two or more EACs are issued based on the same Voyage information.	Two or more users with different roles in the same Voyage (e.g. Shipping Company) fully or partially book the emission data from that Voyage at different times.	Data validation features that consider vessel and Voyage attributes (e.g., IMO number, port of calls, and dates of arrival)
Double use	Occurs when a user utilizes the emission-related data from a Voyage booked in the Registry to also obtain EACs, credits, or other benefits in another market-based mechanism (e.g., fuel or transport-based registries and group mass balance systems).	Shipowners or operators use the emission from a Voyage in another Book and Claim system to monetize twice the Voyage's emission profile.	Although this is outside the scope of the Registry, the Terms of Use will include clauses addressing this issue. In addition, Katalist is participating in working groups to develop interoperability mechanisms that enable the detection of double use practices.

Double claiming	Occurs if an EAC or emission profile is claimed more than once by two or more users of the same role through an EAC's lifecycle.	Physical cargo owners in a Voyage booked in the Registry claim their emission profile when they are not entitled to do it.	Although this is outside the scope of the Registry, mechanisms such as the retirement table and upcoming reporting guidelines will provide the tools to support corporate auditors to detect these practices. In addition, the Terms of Use will include requirement for carriers on emission- related data disclosure to cargo owners outside the Registry.

Annex XIII | Manual Updates

Version	Description of changes	Date
1	Adoption of document	November 14, 2024
1.1	Primarily editorial changes and clarifications	December 20, 2024
2.0	- Reflecting the new “Retirement on Behalf” functionality - Extended timeline for Registry Users accepting Actions from 72 hours to 14 days - Other minor updates	July 1, 2025
3.0	-Addition of new Facilitator Role and Assign/Unassign functionality -Addition of new KPIs and data points	January 12, 2026
3.1	-Updating nomenclature of unit from “Token” to “Environmental Attribute Certificate (EAC)” -Adding visibility of credits included in SMF	June 04, 2026