



DEVELOPMENT OF AN MRV FRAMEWORK FOR THE WASTE SECTOR IN CAMBODIA

Report on fully adapted and deployed WasCAD Tool for the waste sector



March 2026



Initiative for Climate Action Transparency - ICAT

DEVELOPMENT OF AN MRV FRAMEWORK FOR THE WASTE SECTOR, INCLUDING APPLICATION OF THE WASCAD AND GACMO TOOLS, CAMBODIA

Output F - Fully adapted and deployed WasCAD Tool for the waste sector in Cambodia

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Table of contents

List of tables.....	4
1. Introduction.....	5
2. Adaptation and implementation of the Tool.....	5
3. Tool orientation.....	7

List of tables

Table 1: Agenda of the online stakeholder engagement workshop	7
Table 2: Agenda of the onsite workshop	9



1. Introduction

This report presents the set up and implementation of the Waste sector Climate Action Data (WasCAD) tool to support NDC 3.0 tracking in Cambodia's waste sector, under the ICAT Phase 3 project. Purpose of the WasCAD Tool is to support the tracking of mitigation actions and emission reductions under Cambodia's NDC 3.0 in the waste sector, in line with the Enhanced Transparency Framework (ETF). The Tool is designed to enable estimation of baseline emissions, projection of future emissions, and assessment of mitigation impacts across subcategories across waste sector.

Given the current limitations in data availability, operational monitoring, and MRV systems, the Tool facilitates the use of available national data and methodologies to generate consistent and transparent estimates. It supports the identification of key emission sources from waste disposal and wastewater and allows for the evaluation of mitigation measures such as improved waste management practices and wastewater treatment interventions.

The WasCAD Tool enables baseline estimation, emissions modelling, and projection of mitigation impacts for key waste-sector intervention measures. This note summarizes the approach followed for Tool customization, data integration, and implementation.

The objective of this delivery is to adapt and implement the WasCAD tool to support tracking of mitigation actions and emission reductions under Cambodia's NDC 3.0 in the waste sector. This includes customizing the Tool to reflect national circumstances, integrating available data, and applying appropriate methodologies. In addition, it supports strengthening data management, improving consistency in reporting, and aligning NDC tracking with the ETF.

2. Adaptation and implementation of the Tool

The WasCAD Tool was adapted for Cambodia's NDC 3.0 waste sector to align it with national mitigation priorities and the data available in country.

WasCAD tool was initially developed with 10 waste sector methodologies. During the implementation of WasCAD tool in Cambodia, ClimateSI team identified that 5 methodologies that are already in WasCAD tool can be assigned to Cambodia. With support from ClimateSI, ICAT assigned the following methodologies to Cambodia's formal account in WasCAD:

- CDM_ AMS-III.F: Avoidance of methane emissions through composting
- CDM_ AMS-III.E: Avoidance of methane production from decay of biomass through controlled combustion, gasification, or mechanical/thermal treatment



- CDM_AMS-III.H: Methane recovery in wastewater treatment
- CDM_AMS-III.AJ: Recovery and recycling of materials from solid waste
- CDM_ACM0001: Flaring or use of landfill gas

In parallel, with guidance from ClimateSI, ICAT created a new country administrator account for Cambodia in the Tool. ClimateSI then held several meetings with Cambodia's Ministry of Environment (MoE) to agree on the workflow for the country application. As a first step, ClimateSI requested user and institution information from the MoE to enable creation of users and institutions in the Tool. ClimateSI also worked with Mr. Lido to train and coordinate on the setup process.

Next, the relevant NDCs were added to Cambodia's formal account and entered the climate actions linked to those NDCs. Then, the required data providing institutions were created and other related institution types (including the NDC Unit, data collection institution, and QC institution) were also created. To support completion of the remaining workflow-steps in the country application, ClimateSI team created test user accounts for these institutions.

Following the setting up of users and institutions, data request assessments were also conducted for the GHG impact and identified. During this assessment and in consultation with the Cambodia team, it was realized that ClimateSI needs to add six additional methodologies to fully support Cambodia's country application:

- Open Burning (IPCC)
- Textile Waste Recycling (CDM)
- Waste-to-Energy (IPCC + CDM)
- Industrial Wastewater Treatment (IPCC + CDM)
- Solid Waste Landfill (IPCC)
- UNFCCC CDM ACM0001: Flaring or use of landfill gas — Version 19.0-CMB

ClimateSI developed these methodologies, added to WasCAD tool. Then, ClimateSI, with the support from the UNOPS IT team, deployed these methodologies in UNOPS servers. With guidance from ClimateSI, ICAT then assigned the newly deployed methodologies to Cambodia's formal account. After this, GHG impact data request assessments were completed for climate actions. Once the assessments for all actions were completed, the data requests were sent to collect the required parameters to the relevant institutions through the data collection team. This enabled institution administrators to log into the Tool and assign data requests to data entry operators for data entry.

Overall, this process ensured that Cambodia's waste sector actions under NDC 3.0 were fully configured in WasCAD using appropriate methodologies, institutional roles and a complete data request workflow were defined, so that institutions can submit data consistently and the country can generate credible GHG mitigation estimates for reporting and decision making.



3. Stakeholder orientation on the Tool

This process focused on engaging stakeholders and demonstrating practical application of the Tool. This step involved discussions with and training workshops for internal stakeholders under Cambodian context.

Stakeholder Discussions: The national team conducted discussions with stakeholders involved in NDC 3.0 waste sector actions. As part of this process, Deliverable E (Reports on NDC tracking indicators and data gaps for the waste sector) was prepared and used to identify relevant institutions and potential users of the WasCAD Tool.

Stakeholder engagement and workshops: An online workshop was conducted by ClimateSI with the support of Climate Change Department, Ministry of Environment of Cambodia, on 17 February 2026. Focus of this workshop was introduction of the WasCAD Tool to stakeholders, and demonstrating its common functionalities such as climate action creation, and GHG impact assessment. Overall objectives of the workshop were:

1. Engage key stakeholders involved in waste data collection, to demonstrate the WasCAD Tool.
2. Building capacity to use the Tool effectively; and establishing a common understanding of data requirements, roles, and responsibilities among all participants. This alignment is critical for maintaining accuracy and consistency across all waste data collection and reporting activities.

Below is the agenda of the online stakeholder engagement workshop.

Table 1: Agenda of the online stakeholder engagement workshop

Time	Programme	Responsible
13:30 - 14:00	Registration	Admin & Project Team
14:00 - 14:10	Welcome Remarks	ICAT Representative
14:10 - 14:20	Opening Remarks	H.E. Sum Thy, Director General of the GDPS, Ministry of Environment
14:20 - 14:25	Group Photo	All Participants
14:25 - 14:30	Introduction and objective of the workshop	Mr. Lun Lido Dept. of Climate Change
14:30 - 15:10	Introduction to the WasCAD Tool and Demonstration of common functionalities of Users	ClimateSI



15:10 - 15:20	Break (10 min.)	
15:20 - 15:40	Guidance on how to propose climate action in the WasCAD Tool	ClimateSI
15:40 – 16:20	Application of WasCAD for NDC tracking in the waste sector	ClimateSI
16:20 – 16:40	Waste sector indicators to track NDCs	ClimateSI
16:40-17:00	Q&A and Group Discussion	All Participants
17:00	Closing Remarks	Mr. OUK Navann, Deputy Director General of the GDPS, MoE

Onsite hands-on training: Stakeholders participated in an onsite training on 13 March 2026 to gain practical experience on using the Tool. The workshop was conducted by ClimateSI with the support of Climate Change Department, Ministry of Environment of Cambodia. This one-day workshop was conducted at Cambodian hotel, Phnom Penh with 40+ participants representing both the government and private sectors.

Purpose of the workshop was to strengthen participants’ technical capacity to effectively use the WasCAD Tool for waste-sector climate action planning and monitoring.

Specifically, the workshop aimed to:

1. Strengthen participants' technical capacity to effectively navigate and utilize the WasCAD Tool for waste-sector climate action planning and monitoring.
2. Provide hands-on experience with the Tool's core functionalities, including user interface navigation, data entry protocols, and reporting features.
3. Train participants on systematic approaches to data collection, climate action tracking, and greenhouse gas emissions quantification in the waste sector.
4. Demonstrate how to conduct mitigation option analysis using MAC curves to support evidence-based decision-making.

This training included:

- Introduction and demonstration of common functionalities of the Tool
- Climate action creation
- “Enter data” approach and “Collect data” approach
- GHG impact assessment
- MAC assessment

The workshop included a demonstration of the WasCAD Tool, along with practical exercises that provided participants with hands-on experience in using the Tool effectively. Following is the agenda of the onsite workshop.



Table 2: Agenda of the onsite workshop

Time	Programme	Responsible
08:30 – 09:00	Registration	Admin. and Project team
09:00 – 09:10	Welcome Remarks	Mr. Oleg Bulanyi, Senior Programme Manager, ICAT Secretariat
09:10 – 09:20	Opening Remarks	H.E. Sum Thy, Director General of the General Directorate of Policy and Strategy, Ministry of Environment
09:20 – 09:35	Photo Session & Coffee Break	All Participants
09:35 – 09:45	Objective of the workshop	Mr. Lun Lido Dept. of Climate Change
09:45 – 10:15	Overview of Cambodia's Waste Sector and NDC 3.0 Targets	Mr. CHHOM Chanchhaya Team Lead Consultant
10:15 - 10:45	Session 1: Introduction to WasCAD Tool, (includes: Overview/common functionalities/ main users and their roles in the WasCAD Tool)	ClimateSI
10:45 - 11:20	Session 2: Application of WasCAD for NDC tracking – Create climate actions	ClimateSI
11:20 - 12:00	Practice exercise to session 2	ClimateSI
12:00 - 13:00	Lunch time	All Participants
13:00 – 13:30	Session 3: Application of WasCAD for NDC tracking – Data collection approach	ClimateSI
13:30 – 14:00	Practice exercise to session 3	ClimateSI
14:00 – 14:30	Session 4: Application of WasCAD for NDC tracking – Enter data approach	ClimateSI



14:30 – 15:00	Practice exercise to session 4	ClimateSI
15:00 – 15:15	Coffee break	All Participants
15:15 – 15:35	Session 5: Application of WasCAD for MAC assessment	ClimateSI
15:35 – 16:10	Practice on exercise to session 5	ClimateSI
16:10 – 16:30	Q&A session	All Participants
16:30 – 16:45	Closing remarks	Mr. OUK Navann Deputy Director General, GDPS, MoE

As part of the stakeholder engagement and training workshops, the deliverable G (Stakeholder workshop report and training workshop reports) was prepared and shared with the ICAT secretariat. Further, the training materials and session recordings of the WasCAD Tool were prepared and shared with Cambodian stakeholders. They are available for future reference and capacity-building purposes.



ICAT CLIMATE ACTION DATA TOOL USER MANUAL

Country portal users

Version 1.2
By ClimateSI

Contents

1. Introduction	3
2. Users	3
3. Landing page	5
4. Log in	6
5. Dashboard	7
6. Manage users	8
6.1 Available users	8
6.2 Create users	9
7. Manage institutions	10
8. GHG impact and MAC module	11
8.1 Propose climate action	11
8.2 Accept climate action	14
8.3 Assess climate action	15
8.4 Send data requests	20
8.5 Assign data requests	21
8.6 Data entry	22
8.7 Review data	24
8.8 Approve data	24
8.9 Quality control	25
8.10 Verification	26
8.11 Reports generation	37
9. Activity log	38
10. Greenhouse gas inventory interface	39
10.1 GHG inventory management	39
10.2 GHG inventory assessment	41
10.3 Send data requests	43
10.4 Assign data requests	44
10.5 Data entry	45
10.6 Review data	47
10.7 Approve data	47

10.8 Quality control	49
10.9 Verification.....	50
10.10 GHG inventory assessment list	56
10.11 Export XML files	57

1. Introduction

ICAT Climate Action Data (CAD) tool is a comprehensive tool designed to help countries to assess the impacts of climate actions systematically in the transport and waste sectors. It simplifies the entire data collection process by providing standardised methodologies, automated calculations, and integrated reporting features. Additionally, CAD enables the collection of GHG inventory activity data for Tier 1 emission sources for these two sectors.

The country portal allows users within a country to log in and access the tool's features seamlessly. Users listed in the table below can refer this user manual as a guidance for using the tool. The functionalities described in the user manual are common to different types of users but may not appear to all users. To avoid repetition, this user guide is developed focusing on the functionalities. Detailed videos are available for each user to learn about the different functionalities. The videos can be found in learning materials section after logging to the tool.

2. Users

CAD is designed to be operated by different users. There are different user types, and each user has different functions in the operation of the tool. These users and their functions are shown in the table below.

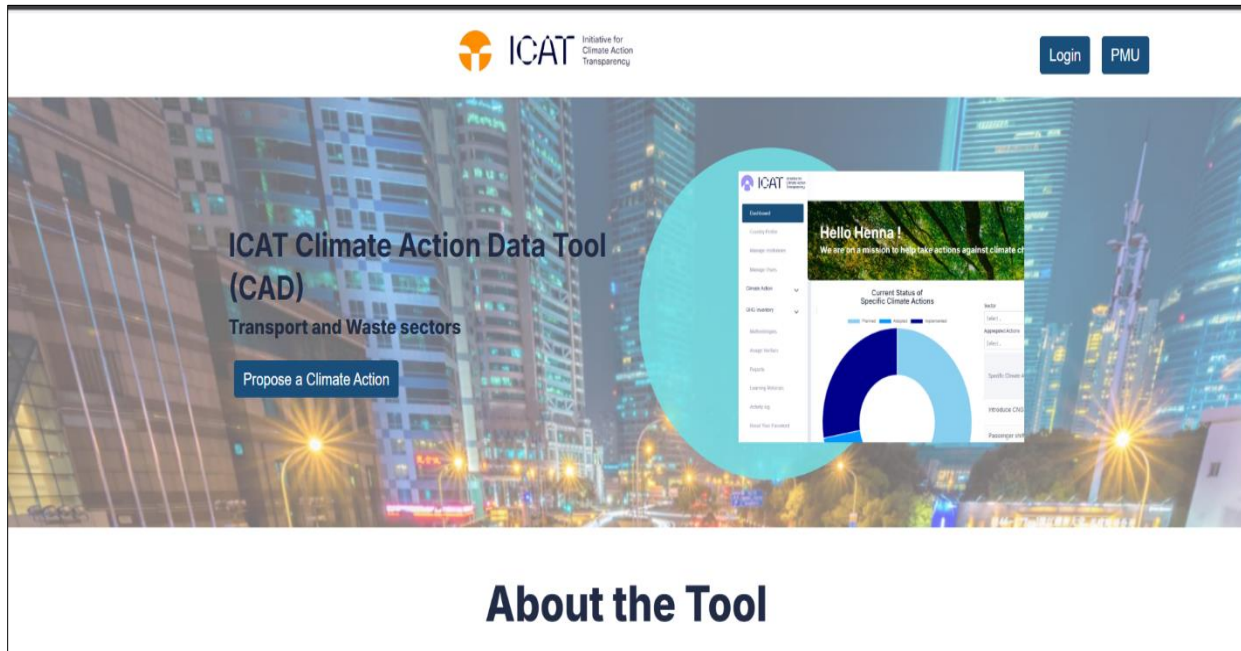
User	Functions
Country admin	<ul style="list-style-type: none"> Manage users of the respective country Manage institutions Manage and track climate actions Assign verifiers Manage reports Manage Green House Gas (GHG) inventories Generate GHG inventory extensible markup language (XML) files
Sector admin	<ul style="list-style-type: none"> Manage institutions Manage users Manage, assess and track climate actions View and download assessment results Manage verification Generate reports Conduct GHG inventory assessments Generate GHG inventory XML files
MRV admin	<ul style="list-style-type: none"> Manage institutions

	<p>Manage users</p> <p>Approve data requests</p> <p>Send data requests</p> <p>Manage default values</p> <p>Manage and assess climate actions</p> <p>Quality control</p> <p>View and download assessment results</p> <p>Manage verification</p> <p>Generate reports</p>
Technical team	<p>Manage institutions</p> <p>Manage users</p> <p>Manage and assess climate actions</p> <p>View and download assessment results</p> <p>Manage verification</p> <p>Generate reports</p>
Data collection team	<p>Data collection</p> <p>Manage institutions</p> <p>Manage users</p> <p>Approve data requests</p> <p>Send data requests</p> <p>Manage default values</p>
Quality control (QC) team	<p>Quality control of GHG inventory, GHG impacts and marginal abatement cost and MAC assessments</p>
Verifier	<p>Verification of GHG inventory, GHG impacts and MAC assessments</p>
Institutional admin	<p>Enter data for parameters</p> <p>Assign data request to data entry operators</p> <p>Review data</p> <p>Create data entry operators</p> <p>Manage climate actions</p>
Data entry operator	<p>Provide data for requested parameters.</p> <p>Manage climate actions</p>

3. Landing page

Landing page provides an overview of the system.

Link: <https://unops-cpit-icat-prod-tracad-country-portal-web-788109338760.europe-west3.run.app/landing-page>



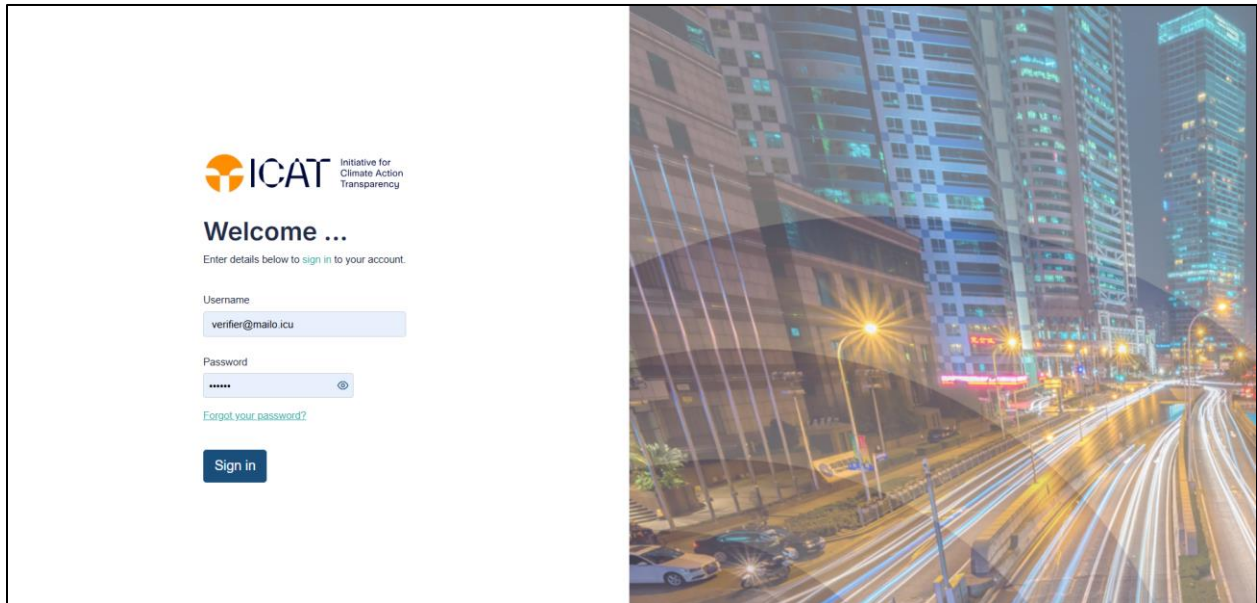
Users can have access to the CAD tool by using the 'login' button in the upper right-hand corner of the landing page. The link <https://unops-cpit-icat-prod-tracad-country-portal-web-788109338760.europe-west3.run.app/login>, also provides direct access to the login page. Stakeholders can propose climate actions by clicking the 'propose a climate action' button and adding the required data. For more information, please refer section 8.1

4. Log in

There are two ways to log in to the country portal.

1. Through the direct link - <https://unops-cpit-icat-prod-tracad-country-portal-web-788109338760.europe-west3.run.app/login>
2. By clicking the 'login' button at the top right corner of the landing page.

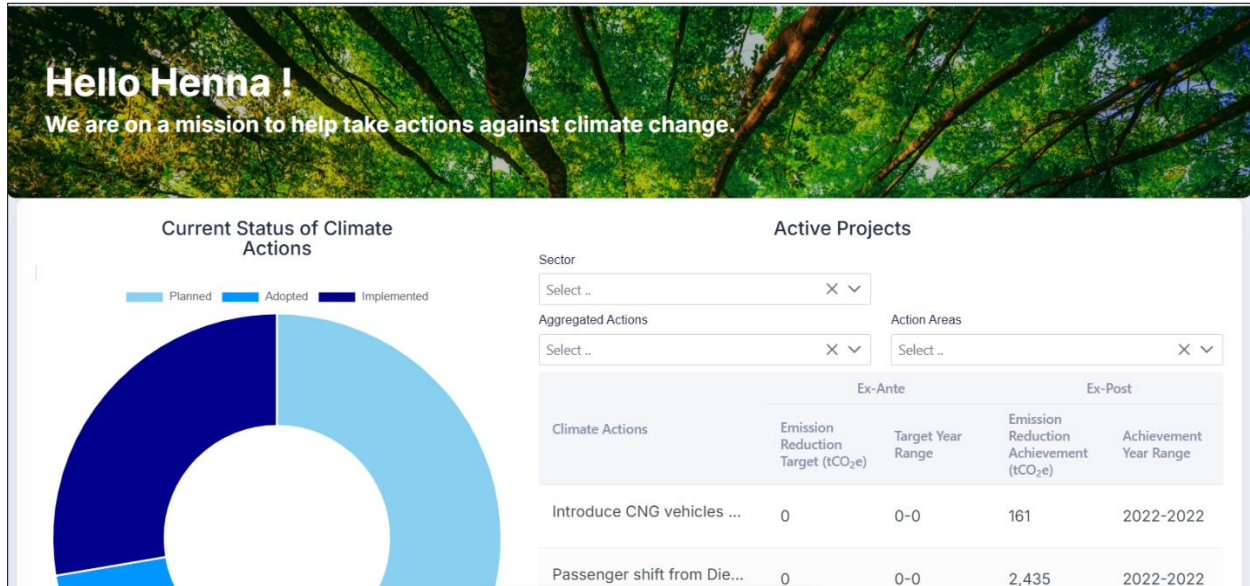
Then, the user will be directed to the page shown below.



All the country users can log in to the ICAT CAD tool through this portal.

5. Dashboard

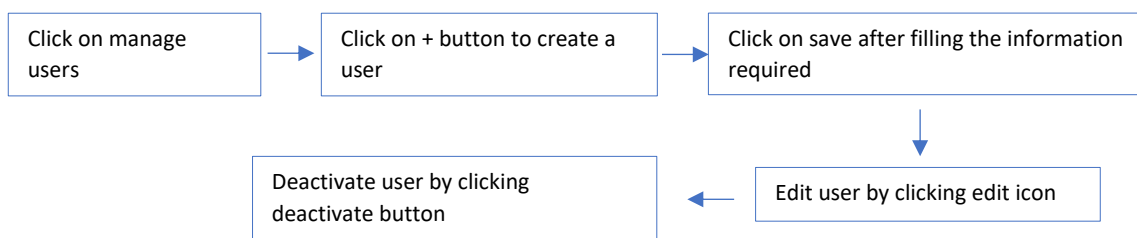
Once logged into the tool, the user will be directed to the dashboard, or the dashboard can be selected from the sidebar menu.



The dashboard visualises several functionalities. They are,

- current status of climate actions.
- active projects.
- aggregated actions' achievements.
- emission reduction targets graph.
- MAC curve year (MAC curve year refers to the year used for ex-ante (future projections) and ex-post (past evaluations) analyses)

6. Manage users

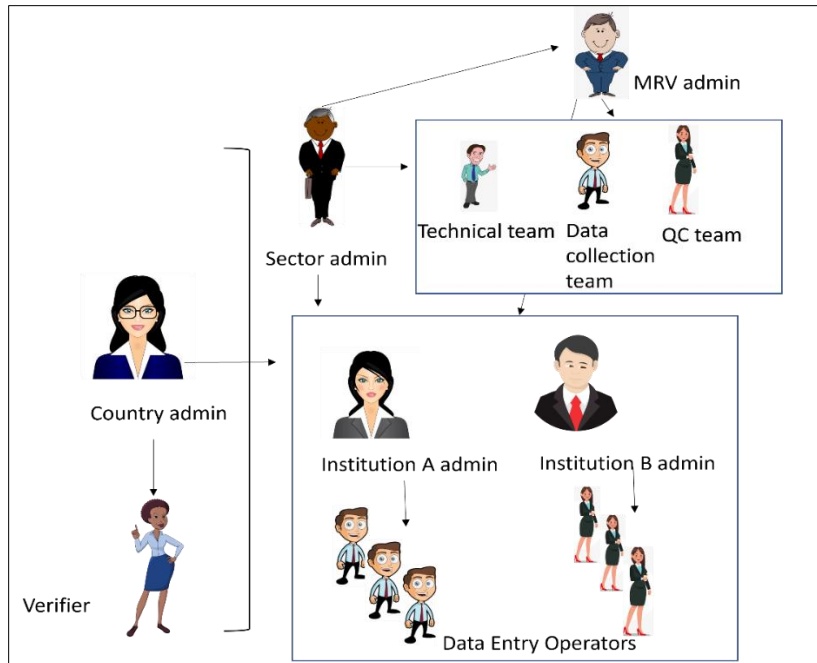


6.1 Available users

According to the tool's design, some users can create other users. The table below shows this ability to create users. The first column lists different user types, and the types of users that can be created are marked in the other columns.

	MRV admin	Sector admin	Technical team	QC team	Data collection team	Institution admin	Data entry operator	Verifier
County admin	√	√	√	√	√	√	√	√
MRV admin		√	√	√	√	√	√	
Sector admin			√	√	√	√	√	
Technical team/data collection team						√	√	
Institution admin							√	

The image below further illustrates how users can create other types of users, as shown by the arrows.



6.2 Create users

Creation of users depends on the requirements of the country or institution and creation of all types of users is not mandatory. Users can be created by entering the list of data that appears after clicking the plus (+) button. Entered data can be saved by clicking the ‘save’ button.

Some users can only be created under a specific institution type. For example, sector admins can only be created for the institutions created under the NDC unit; verifiers may only be created under an institution which is categorized as ‘UNFCCC focal point’.

Create User

Institution *

User Type*

First Name *

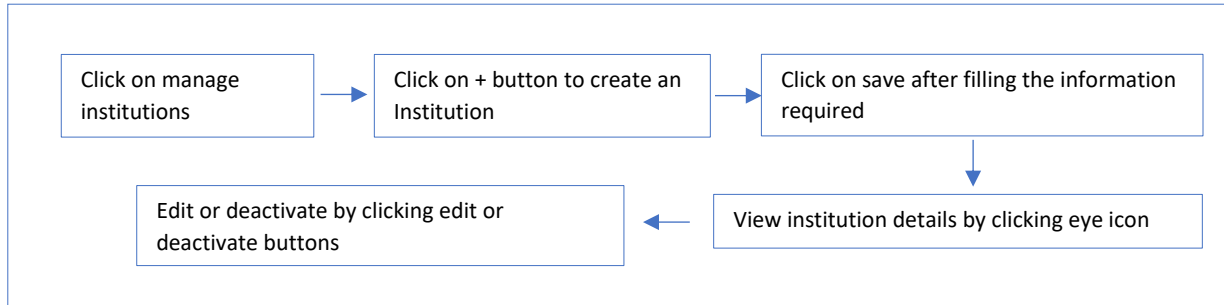
Last Name *

Email *

Designation/Role *

Phone Number *

7. Manage institutions

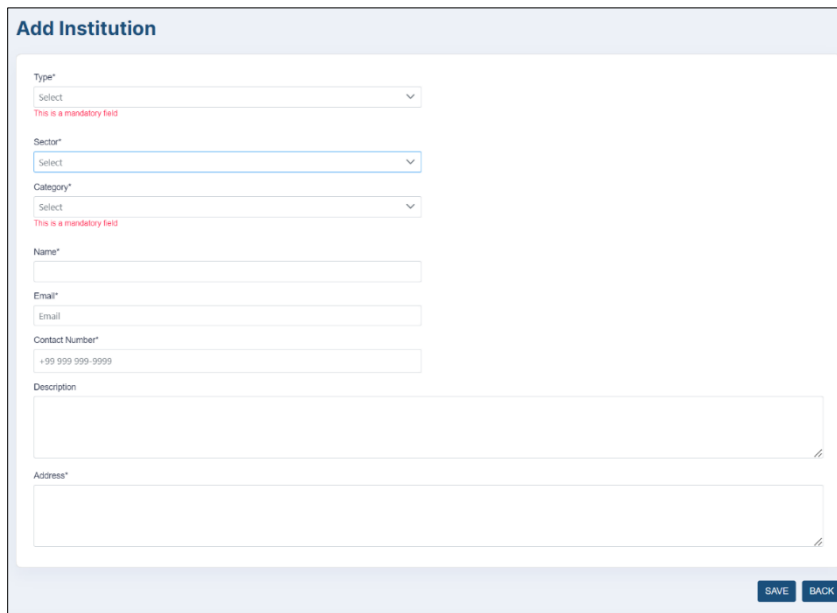


Institutions can be created by entering the list of data that appears when clicking the plus (+) button. Data can be saved by clicking the ‘Save’ button.

The system allows users to create following institutions.

- Data collection team
- Data provider
- NDC unit
- QC team
- Technical team
- UNFCCC focal point

The type of institution determines the types of users that can be created within it. For instance, sector admins can only be created for institutions under the NDC unit. On the other hand, verifiers can only be created under the institutions categorized as 'UNFCCC focal point'.



Add Institution

Type*

This is a mandatory field

Sector*

Category*

This is a mandatory field

Name*

Email*

Contact Number*

Description

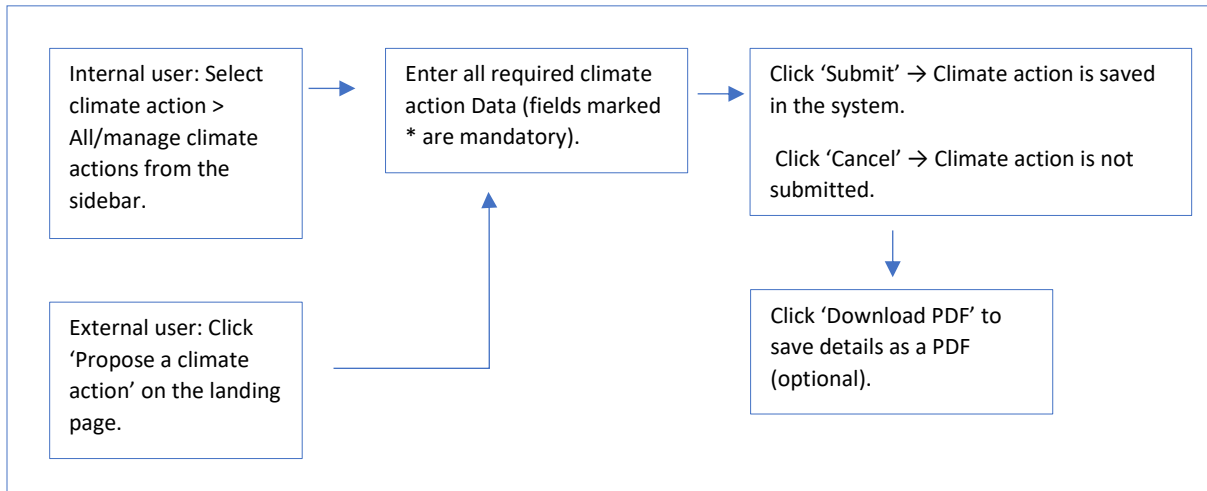
Address*

SAVE **BACK**

8. GHG impact and MAC module

The GHG impact and MAC assessment modules in CAD enable countries to evaluate the effectiveness and costs of climate actions. The GHG impact assessment utilises over 35 international methodologies to measure emission reductions through ex-ante and ex-post approaches. Meanwhile, the MAC assessment calculates the costs of these actions and generates a MAC curve, helping countries to identify the most cost-effective strategies for reducing emissions.

8.1 Propose climate action



Internal user can select ‘climate action’ and then ‘all/manage climate actions’ from the sidebar menu. External user can click on ‘Propose a climate action’ on the landing page. When they click on plus (+) mark, both external and internal users will be directed to the propose a climate action page. A climate action can be proposed by entering the data to the box shown below. All mandatory fields which marked as * should be filled.

Propose Climate Action	
Contact Details	
Full Name*	Email*
<input type="text"/>	<input type="text"/>
Designation*	Telephone Number*
<input type="text"/>	<input type="text"/>
Project Proponent*	Mobile Number
<input type="text"/>	<input type="text"/>

An example of the completed data is shown here.

Contact details

- **Full name:** Bour Chhayya
- **Email:** chchengsamnang@yahoo.com
- **Designation:** Deputy chief officer/General Department of Planning and Policy
- **Telephone number:** +855586394739
- **Project proponent:** Ministry of Public Works and Transport
- **Mobile number:** +85592382394

Details on the climate action

- **Name of the CA:** Shift passenger from motor cars to 50 buses in Krong Siem Reap
- **Country of the CA:** Cambodia (An internal user can only propose climate actions for their own country)
- **Current status of the CA:** Planned
- **Sector:** Transport
- **Aggregated actions:** Shifting from private to public means of transport
- **Action areas:** - Shift from motor cars to public buses
- **Scope of the climate action:** Introduce 50 new buses to Krong Siem Reap city for inter-city transportation
- **Ownership:** Government
- **Duration of the CA (Years):** 20.0
- **Proposed date of commencement:** 01/05/2023
- **Proposed end date:** 01/01/2030
- **Objective of the climate action:** Improve modal share of the public buses. Reduce traffic congestion

Location/Influence area

- **Country:** Cambodia
- **Longitude:** 103.860313
- **Latitude:** 13.364047

Details on the Climate Action

Name of the Climate Action* Country of the Climate Action*

Current Status of the Climate Action*

Sector*

Aggregated Action* Action Area*

Scope of the Climate Action*

Ownership* Duration of the Climate Action (Years)*


Proposed Start Date* Proposed End Date*

Objective of the Climate Action*

Sub National

Longitude

Latitude



Outcomes/Benefits/Progress

Outcomes of the climate action

Current progress of the climate action

GHG emission reduction

Adaptation benefits

Relevant direct SD benefits

Relevant indirect SD benefits

IPCC Categories

Stakeholders

Implementing entity

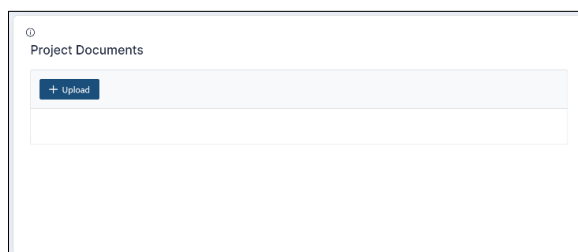
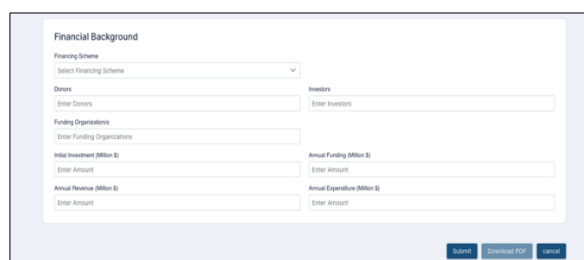
Executing entity

Other parties involved

Beneficiaries

Outcomes/Benefits/Progress

- Outcomes of the CA: Reduce traffic congestion, reduce air pollution, increase average speed of transport modes, and reduce private automobiles
- Current progress of the CA: JICA is conducting a pre-feasibility assessment
- GHG emission reduction: Not estimated
- Adaptation benefits: N/A
- Relevant direct SD benefits: Goal 11 sustainable cities and communities
- Relevant indirect SD benefits: Goal 13 climate actions, Goal 5 gender equity
- IPCC Categories: 1.A.3.b.iii - Heavy-duty trucks and buses

Stakeholders

- Implementing entity: General Department of Land Transport
- Executing entity: City bus authority
- Other parties involved: Ministry of Public Work and Transport
- Beneficiaries: General public

Project documents

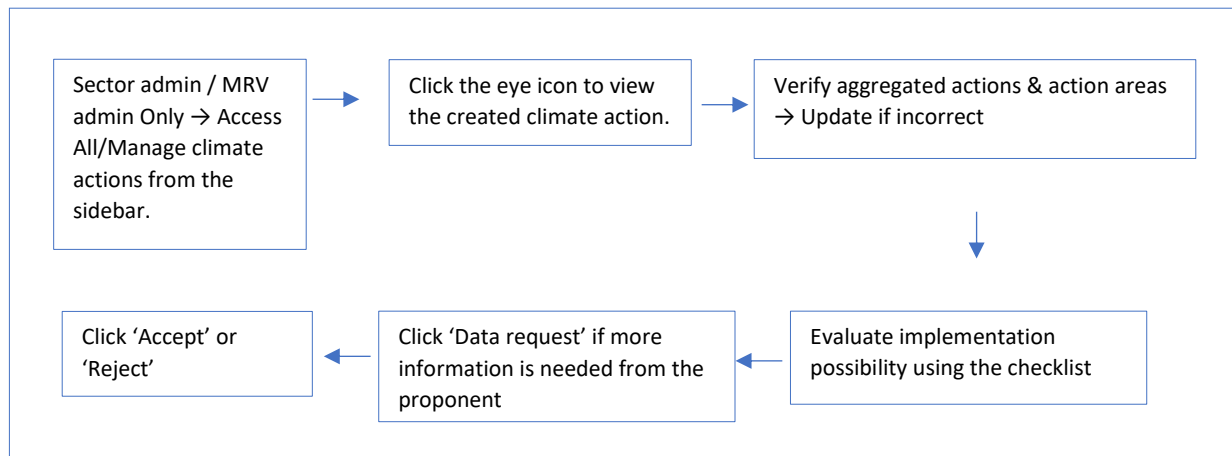
- Upload: select and upload related documents

Financial background

- Financial scheme: Grant
- Donors: JICA
- Investors: - JICA
- Funding organizations: JICA
- Initial investment (\$): 7,315,120
- Annual revenue (\$): 1,087,262
- Expected recurrent expenditure (\$): 4,866,655

Once all the data are entered, climate action can be saved in the system by clicking the ‘submit’ button. If the user wishes not to submit climate action, he/she can click ‘cancel.’ All the submitted details of the climate action can be downloaded as a PDF document by clicking the ‘download PDF’ button.

8.2 Accept climate action



Only sector admins and MRV admins can accept a climate action. These two users can select ‘all/ manage climate actions’ from the sidebar menu. First, the users can view the created climate action by clicking on the eye icon.

Secondly, the users must check whether the proponent has correctly mapped the aggregated actions and action areas. If not, users should update them with the correct aggregated action and action area.



Then, the users must select the possibility of implementing climate action from the criteria on the checklist. The checklist is comprised of the following criteria.

- Likelihood of the GHG impact of the climate action.
- Political preference to implement.
- Financial feasibility.
- Availability of required technologies.

Approval Check List

Indicate the likelihood of GHG impact of this CA Low Medium High

Political preference to implement Low Medium High

Financial feasibility Low Medium High

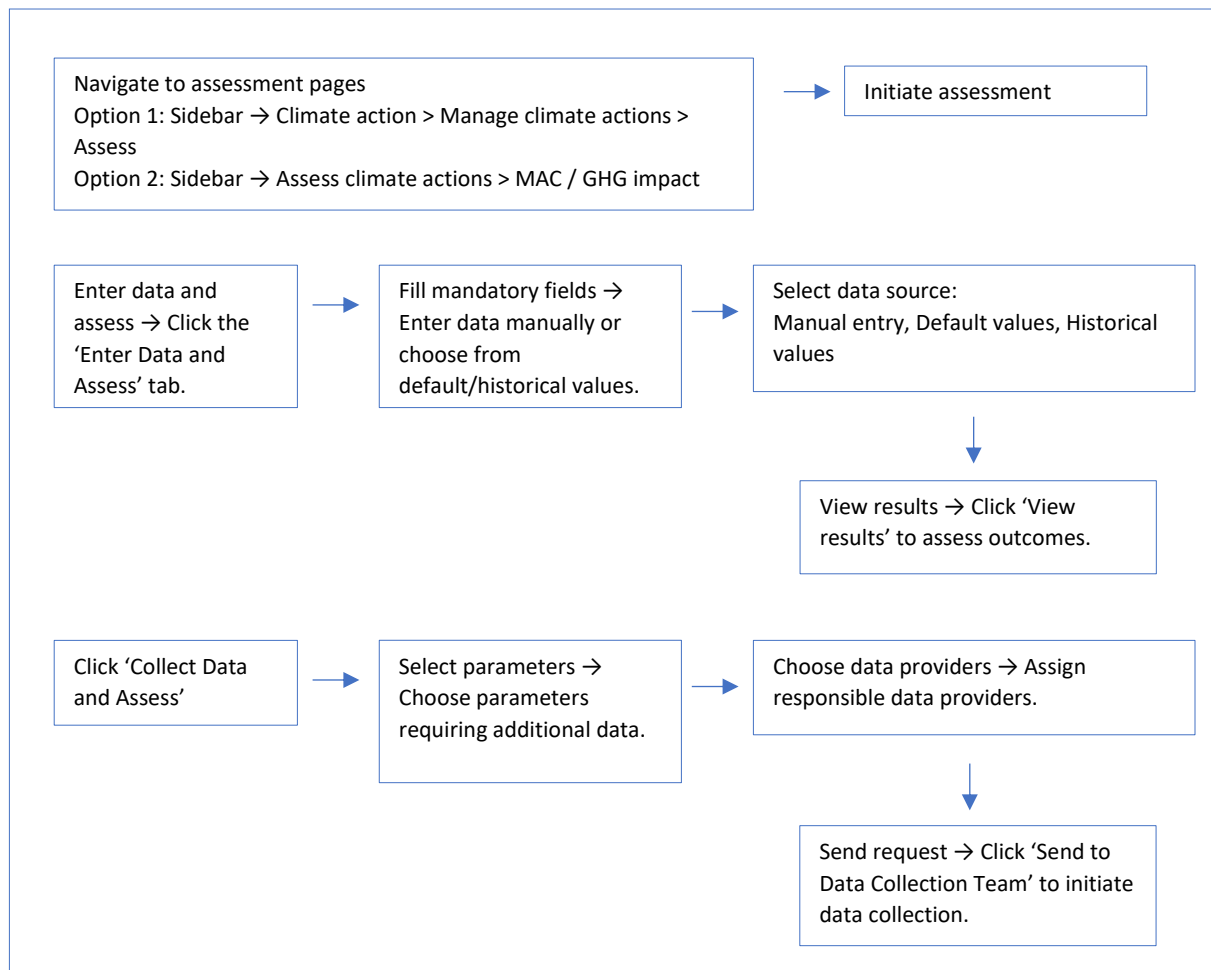
Availability of required technology Yes No

Justification for your action*

Accept
Reject
Data Request

If the user is satisfied with the provided information and climate action, he /she can click ‘data request’ to ask the proponent for further information. The user can accept or reject the climate action by clicking respective buttons. If the action is unacceptable, the user must include an explanation for rejecting it. Also, the user needs to justify the approval to trace the steps in the decision-making process.

8.3 Assess climate action



Two types of assessments (MAC/GHG impact) are available under climate action. There are two ways to navigate the tool's assessment pages for GHG Impact and MAC modules.

1. Click on the Sidebar menu: Climate action > Manage climate actions > Assess
2. Click on the Sidebar menu: Assess climate actions > MAC / GHG impact

Sector admin, MRV admin and technical team can assess a climate action. Users can conduct an initial assessment using the data those are already available for both the MAC and GHG assessments. This preliminary analysis can help to determine whether to accept or reject a project. Another option is to collect the data needed for the assessment from different data-provider institutions.

MAC

Users can assess the cost associated with emission reduction. This assessment uses emission reduction as an input. Therefore, the GHG impact assessment module will also be linked to this module. However, users will also have the option to enter data directly.

GHG

The GHG impact assessment module provides provisions for assessing the GHG impacts associated with the mitigation actions. There are two assessment approaches: ex-ante and ex-post.

Ex ante

Ex-ante is the process of estimating the expected future GHG impacts of a climate action.

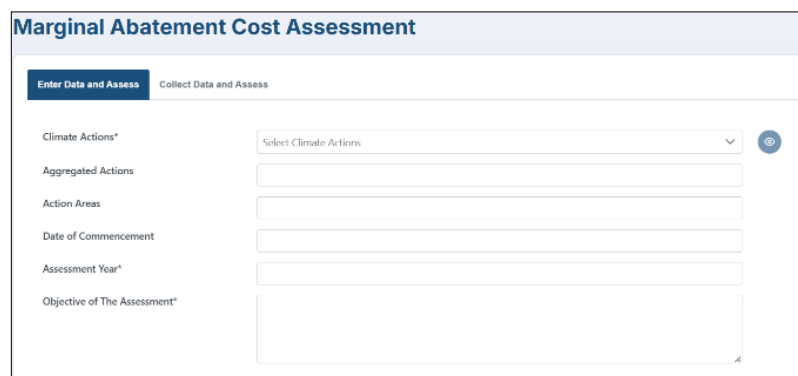
Ex-post

Ex-post is the process of assessing the historical GHG impacts of a climate action.

MAC

[Enter data and assess](#)

For the first option, users need to click on the 'enter data and assess' tab and fill in all the mandatory fields.



The screenshot shows the 'Marginal Abatement Cost Assessment' form. At the top, there are two tabs: 'Enter Data and Assess' (which is active) and 'Collect Data and Assess'. Below the tabs, the form contains several input fields:

- Climate Actions***: A dropdown menu with the text 'Select Climate Actions' and a search icon.
- Aggregated Actions**: A text input field.
- Action Areas**: A text input field.
- Date of Commencement**: A text input field.
- Assessment Year***: A text input field.
- Objective of The Assessment***: A larger text input area.

Annual Emissions Reduction

Year* 2022 Available Assessments Select Reduction tCO₂e

Discount Rate* (%) 7% Default Values

Annual Cost

Baseline Scenario

Total Investment* (\$) 234543

Project Life* (Year) Electric cars (1000 c... Default Values

Annual O&M* (\$) Electric 18m buses a... Default Values

Annual Fuel Cost* (\$) Electric cars (1000 c... Default Values

Other Annual Costs* (\$) 343243423

Project Scenario

Total Investment* (\$) 343432

Project Life* (Year) Electric cars (1000 c... Default Values

Annual O&M* (\$) Electric 18m buses a... Default Values

Annual Fuel Cost* (\$) Electric cars (1000 c... Default Values

Other Annual Costs* (\$) 5345466

[View Result](#)

Users can enter data manually or select from default or historical values. If a user needs to enter a default or historical value for a parameter, he/she can click the relevant check box, and the system displays all the available data. (Please note that default and historical values are not available for all parameters)

Diesel

Net calorific value TJ/Gg Default Values Historical Values

Click on ‘View results’ to assess the results.

Default values: Users can access the values published by different international and national organizations and can select the appropriate value from the drop-down. The drop-down will indicate the value, unit, applicable year and the name of the organization which published the value. The data collection team can insert default values into the system.

Historical values: This drop-down menu shows the values entered for the same parameter in previous assessments. This indicates the value, unit and the respective year.

[Collect data and assess](#)

For the second option, users need to click the ‘collect data and assess’ tab. In this option, users can select the parameters that need to go through the data collection process and the relevant data providers to whom the request will be sent. Once the information is completed, the user must click ‘send to data collection team’.

Marginal Abatement Cost Assessment

Enter Data and Assess **Collect Data and Assess**

Climate Action* Select Climate Actions

Aggregated Actions

Action Areas

Date of Commencement

Assessment Years

Objective of The Assessment

GHG impact

For the GHG impact assessment, users have two options as explained below.

Option 1 - Enter data and assess

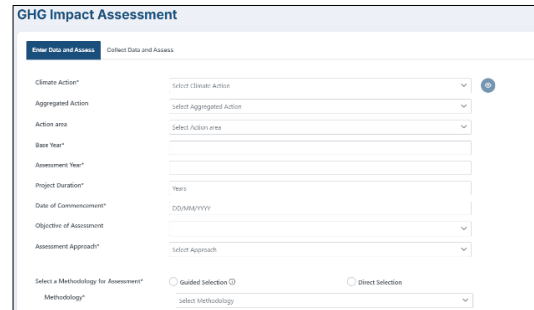
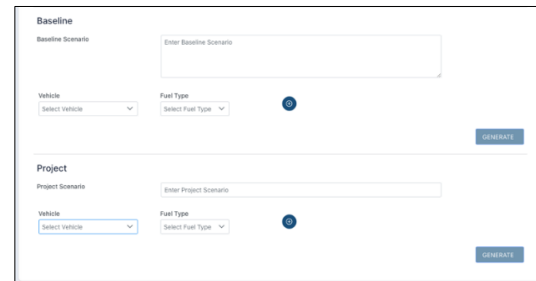
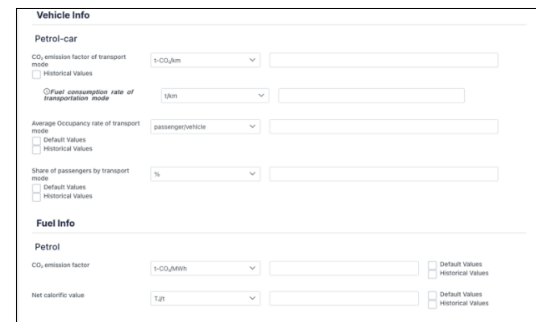
For the first option, users need to click the ‘enter data and assess’ tab and fill all the mandatory fields. The data required for the assessment depend on the methodology used. Therefore, the first thing that users need to do is to ‘select the methodology’. There are two options to select the methodology.

a. Guided selection- This is a pre-defined, criteria-driven selection method to assist users to pick the most appropriate methodology for assessing climate action. This option is intended to be used by users who are not having knowledge of different assessment methodologies.

By selecting guided selection option, the system will assist users in selecting the mitigation action type, determining the application of the assessment, and evaluating the ease of data collection before choosing a methodology. Based on the user's selections for these options, the system will then provide a narrowed-down list of methodologies for the user to choose from.

b. Direct selection- This is a selection method where users of the tool can directly select a methodology from a list for assessing climate action. This option is intended to be used by users having knowledge of different assessment methodologies.

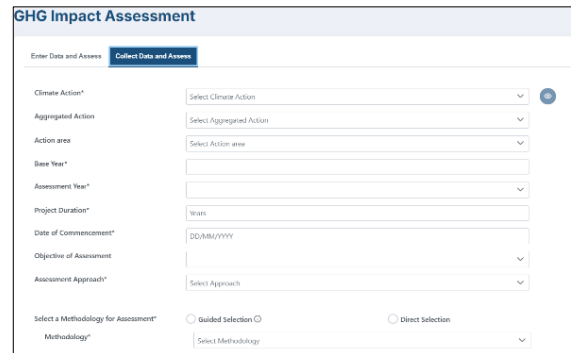
Once the methodology is selected, required parameters appear. Users have to enter a name for the baseline scenario and project scenario and select vehicle and fuel types. If more than one type of vehicle or fuel is involved, users can do multiple selections from the dropdowns. The users need to click on ‘generate’ to access the parameters. The users can enter data for the given parameters or select either from default or historical values.

Option 2 - Collect data and assess

For the second option, users need to click on 'collect data and assess' tab. In this option, users can select the parameters that need to go through the data collection process and can select the relevant data providers to whom the request will be send. Users need to fill the mandatory fields and select the methodology using guided selection or direct selection options, as explained above.

Once the methodology is selected, the required parameters appear. Users have to enter a name for the baseline scenario and project scenario and select vehicle and fuel types. If more than one type of vehicle or fuel is involved, they need to click plus (+) button. The users have to click on 'generate' to access the parameters. They can enter data for the given parameters or select from either default or historical values.



GHG Impact Assessment

Enter Data and Assess **Collect Data and Assess**

Climate Action* (+)

Aggregated Action

Action area

Base Year*

Assessment Year*

Project Duration*

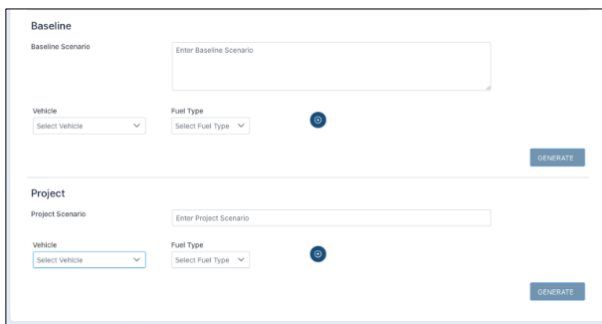
Date of Commencement*

Objective of Assessment

Assessment Approach*

Select a Methodology for Assessment* Guided Selection Direct Selection

Methodology*



Baseline

Baseline Scenario

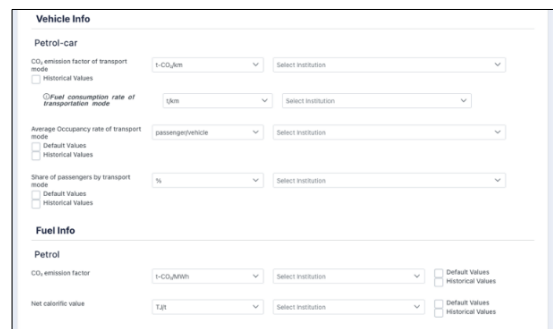
Vehicle Fuel Type (+)

Project

Project Scenario

Vehicle Fuel Type (+)

GENERATE



Vehicle Info

Petrol-car

CO₂ emission factor of transport mode

Historical Values

Fuel consumption rate of transportation mode

Average Occupancy rate of transport mode

Historical Values

Share of passengers by transport mode

Historical Values

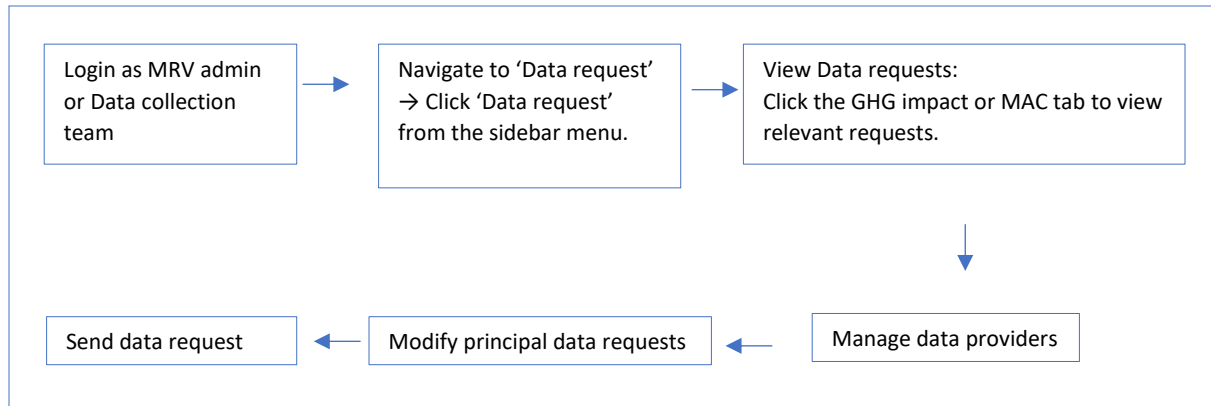
Fuel Info

Petrol

CO₂ emission factor Default Values Historical Values

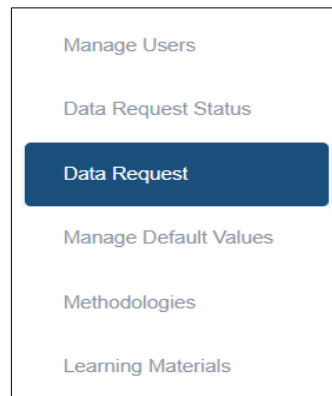
Net calorific value Default Values Historical Values

8.4 Send data requests

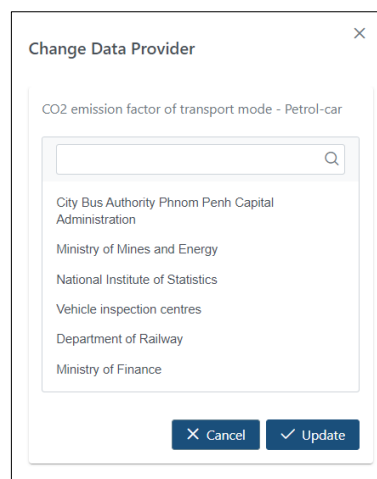


MRV admin or data collection team can log in and send data request by clicking 'data request' in the side bar menu.

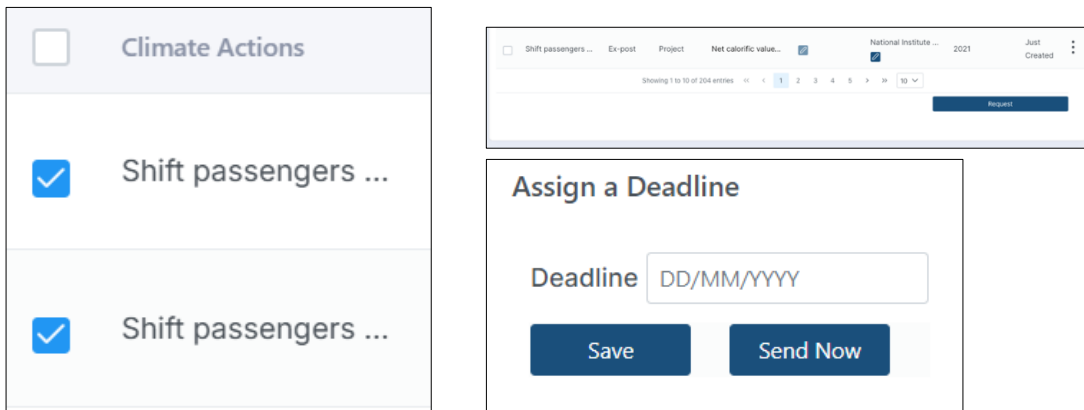
The GHG inventory page will appear by default. To view GHG impact and MAC data requests, the user needs to click the impact and MAC tab. This will display the relevant data requests for GHG Impact and MAC assessments.



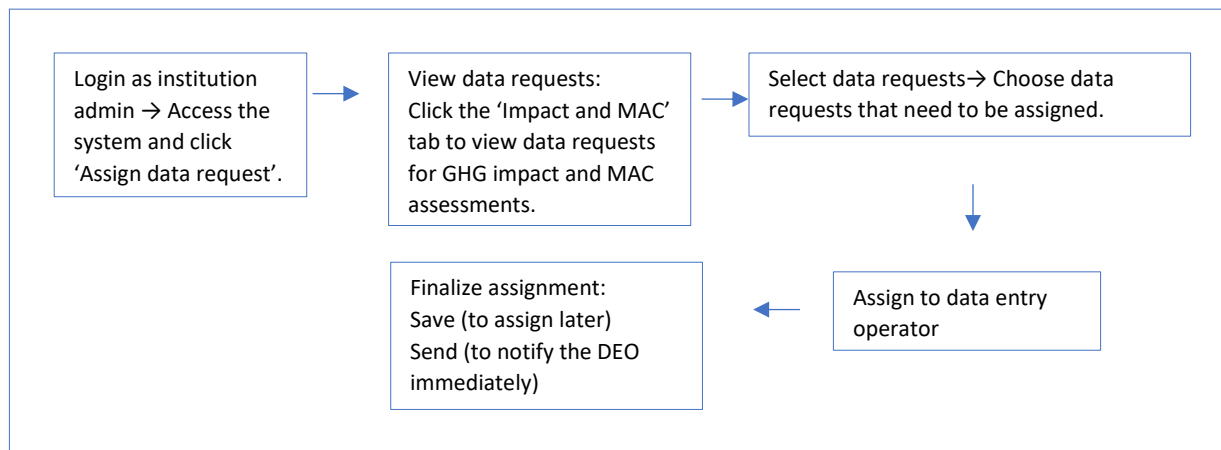
Users can accept or change the suggested data provider. To modify the data provider, they need to click on the 'edit' icon and click on 'update' to save the changes.



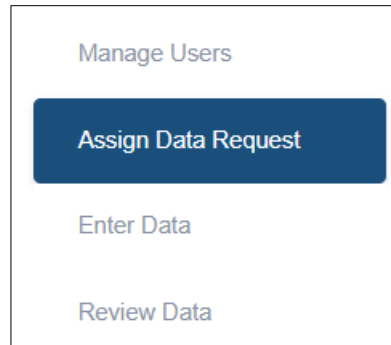
Users can also modify the principal parameters and select alternative ones if needed. For that, users have to click on the edit icon to change the principal parameters to the alternative parameters offered by the tool. Once the edit page is active, users can select all the parameters that need to be changed and click on ‘data request’. Then, a deadline can be assigned to provide data. Data can be saved to send later, or a request can be sent by clicking ‘send now’.



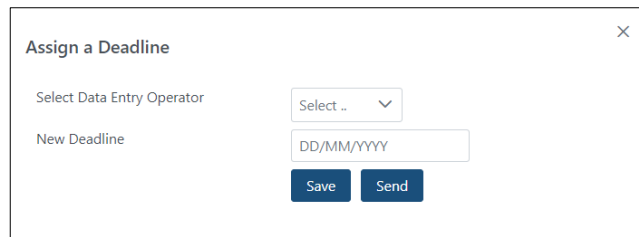
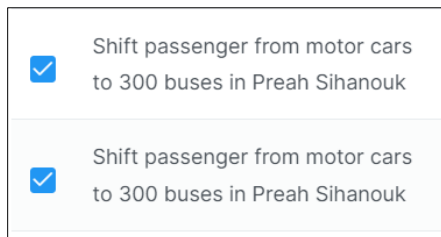
8.5 Assign data requests



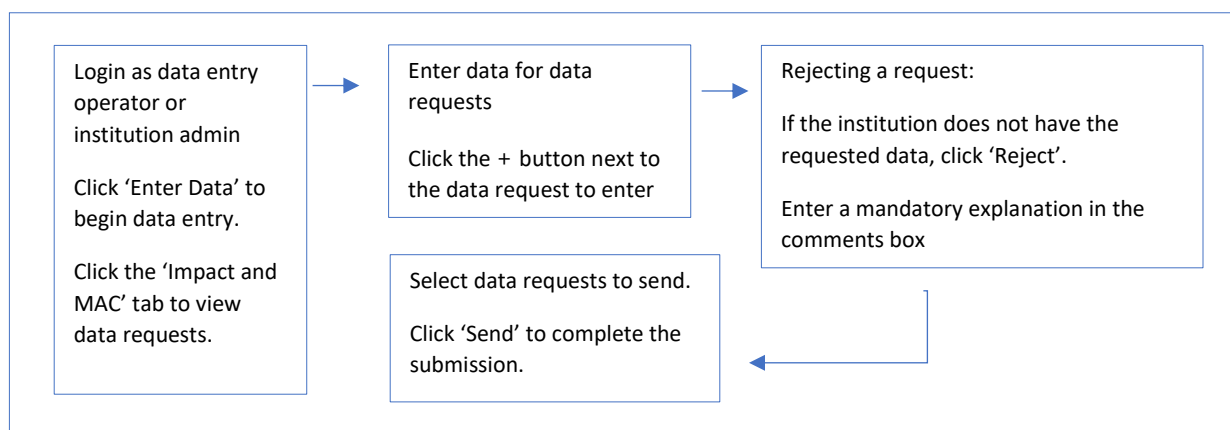
This feature is used by the institution admin in the data-providing institution to assign the data request sent by the data collection team to the responsible data entry operator. The Institution admin must log in to the system and click ‘assign data request’. The GHG inventory page will appear by default. To view GHG impact and MAC data requests, the user needs to click the ‘Impact and MAC’ tab. This will display the relevant data requests for GHG Impact and MAC assessments.



Parameters must be selected and ‘assigned’ to the relevant data entry operator within the data provider institution. Then a data entry operator and a deadline must be selected. Finally, the request can be saved or sent.



8.6 Data entry

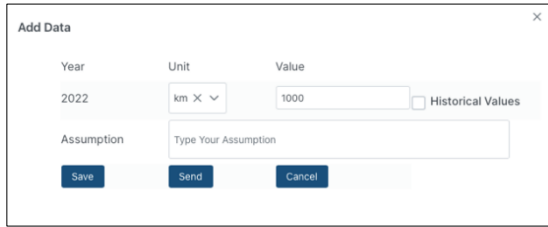


To complete the data request, the user must log in as a data entry operator or an institution admin. The user needs to click on ‘enter data’ to start providing the requested data. The GHG inventory page will appear by default. To view GHG Impact and MAC data requests, he/she needs to click the ‘impact and MAC’ tab.

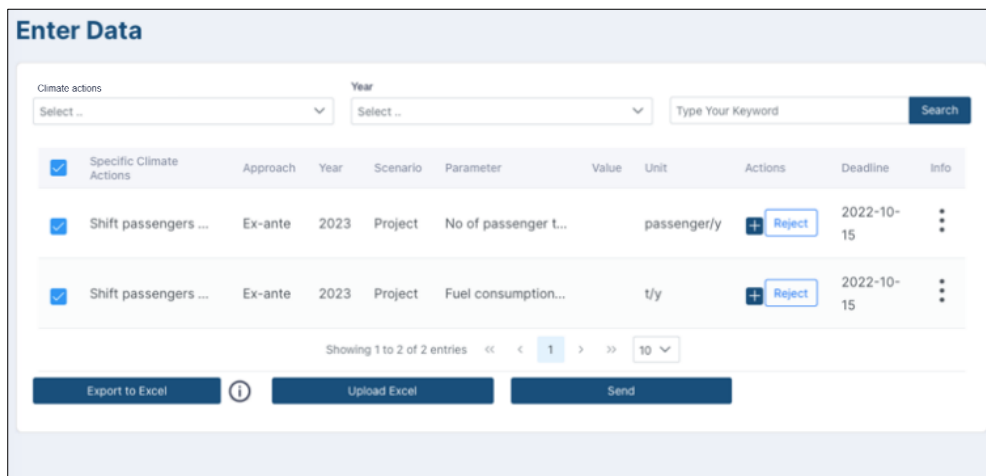
First, the user needs to click the plus (+) button next to the parameter for which he/she wants to enter data. Then he/she needs to follow the steps listed below to add data.

1. Select the unit for the parameter value.
2. Enter the value and the associated assumption. Users can also select a historical value that had previously been entered for the particular parameter in the tool.
3. Click 'save' to save the entered data, and 'send' to send the entered data, or 'cancel' to cancel the entered data.

If the institution doesn't have the requested data for a particular parameter, the user can reject the request with an explanation written in the comments box. Writing an explanation is mandatory for all rejections.



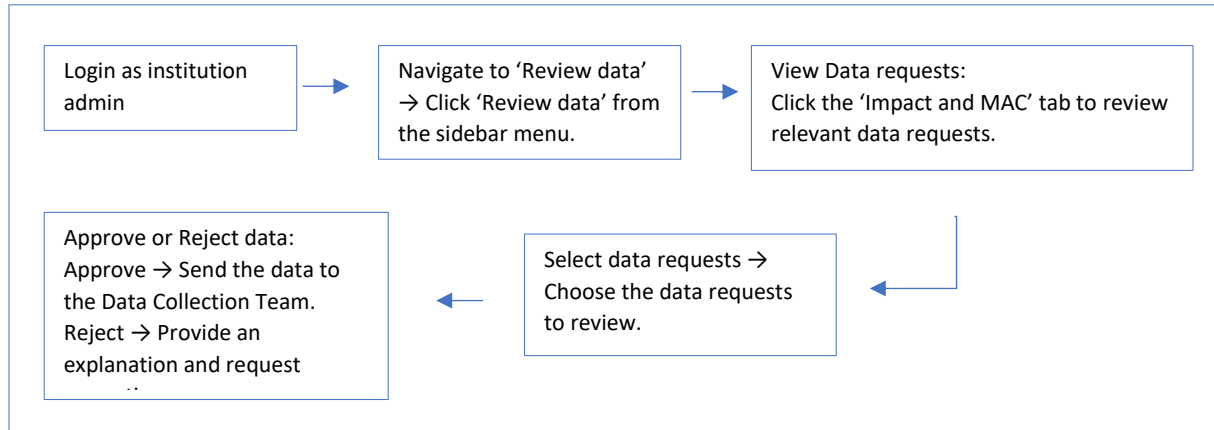
Data can be entered offline as well by selecting a parameter from the list and clicking on 'export to excel'. An excel file will be downloaded with the selected parameters. The user can enter values for the parameters in that excel and upload it back to the tool by clicking on 'upload excel' button.



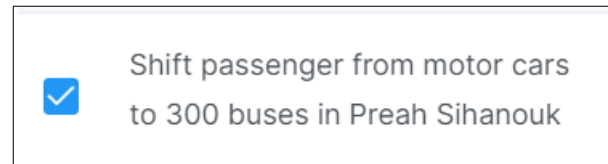
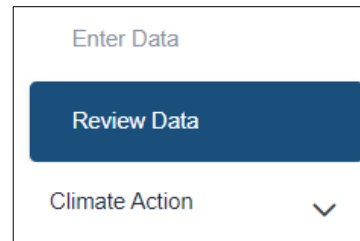
Climate actions	Approach	Year	Scenario	Parameter	Value	Unit	Actions	Deadline	Info
<input checked="" type="checkbox"/> Specific Climate Actions									
<input checked="" type="checkbox"/> Shift passengers ...	Ex-ante	2023	Project	No of passenger t...		passenger/y	<input type="button" value="+ Reject"/>	2022-10-15	⋮
<input checked="" type="checkbox"/> Shift passengers ...	Ex-ante	2023	Project	Fuel consumption...		t/y	<input type="button" value="+ Reject"/>	2022-10-15	⋮

Finally, the user can send data for all the parameters at once or one by one by selecting each parameter. It depends on the user's selection.

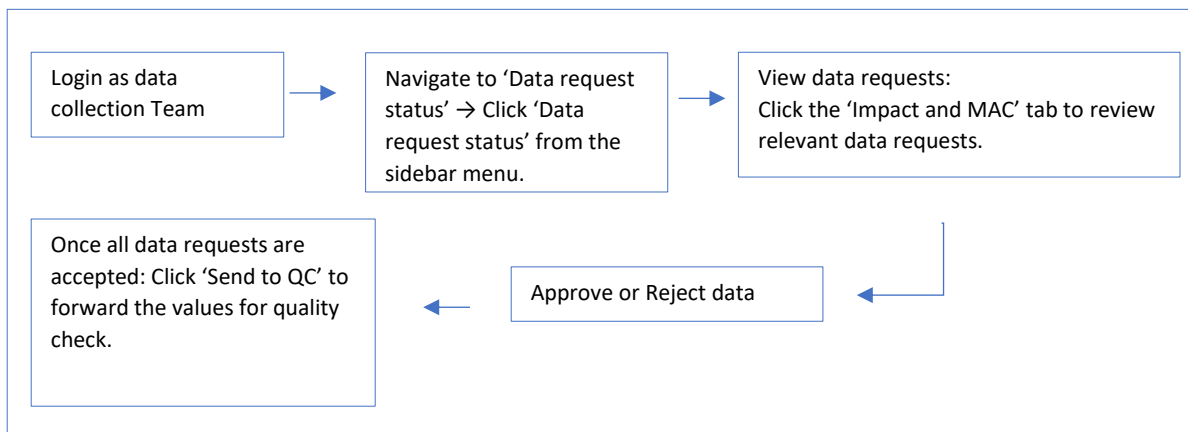
8.7 Review data



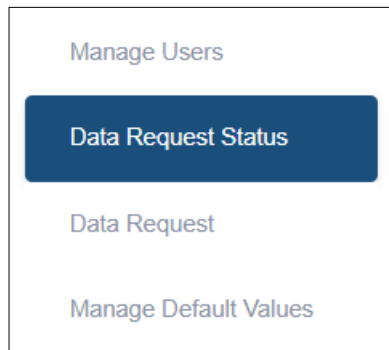
Institution admin can log in and review the data entered by the data entry operator. He/she can approve and send the information to the data collection team or reject them. The institution admin must select 'review data' from the sidebar menu to review data. The GHG inventory page will appear by default. To view GHG impact and MAC data requests, the user must click the 'impact and MAC' tab. Then, the climate action parameters must be selected to be reviewed. Finally, they can be accepted or rejected.



8.8 Approve data

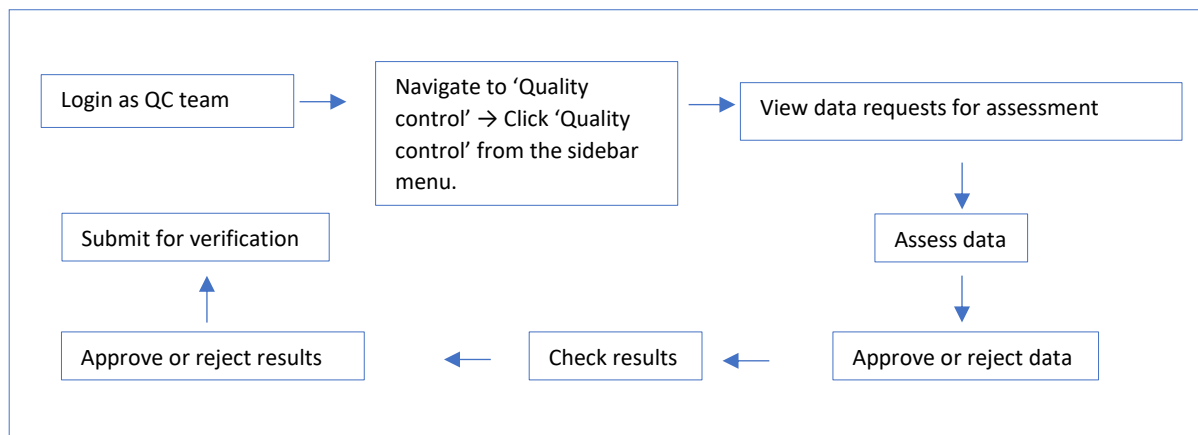


Data collection team is responsible for approving the data set by the data providers. To approve data, the 'data request status' tab must be selected from the sidebar menu.

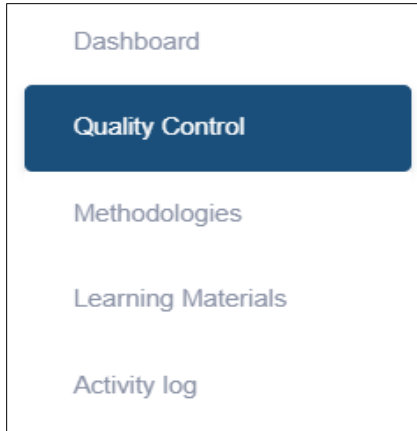


By default, the GHG inventory page will appear. To view GHG impact and MAC assessments, 'impact and MAC' tab must be clicked. Data collection team can approve data by clicking 'approve data.' All the baseline and project parameters which were sent back by the data provider institution need to be accepted or rejected. If a parameter gets rejected, it will be sent back to the data provider institution with an explanation as to why the data is rejected. Data collection team can select all the accepted parameters or analyse them one by one. When all the parameters have been accepted, the data collection team will send the values to the quality control (QC) team to perform a quality check by clicking 'send to QC'.

8.9 Quality control

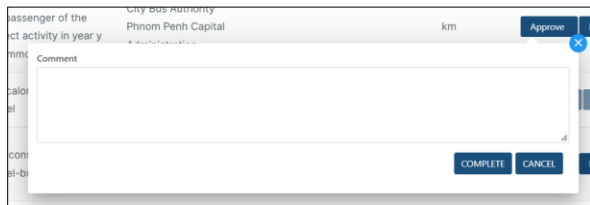


The QC team must log in-to the system and select 'quality control' from the sidebar menu. By default, the GHG inventory page will appear. To view GHG impact and MAC assessments, 'impact and MAC' tab must be clicked. The menu that appears contains the climate actions that were sent for quality assessment. Different buttons will appear. View button appears for quality check already passed and can only view the details of the result. The check button is to do the assessment.



08-06-2022	Pass	View
10-06-2022	Fail	Check
31-07-2022	Pending	Check

Once the entered values are checked, the quality control team can approve or reject the data. If a parameter gets rejected, that particular parameter will be sent back to the data collection process again. QC team can complete the approval by clicking ‘complete’. They can add a comment if necessary.

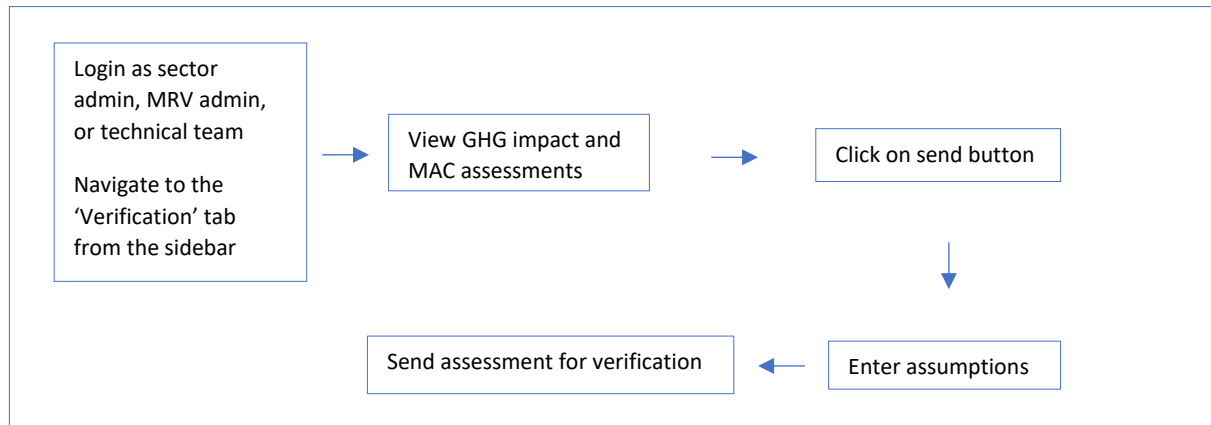


Once all the parameters are accepted, the ‘check result’ button will be enabled. Then, the user must select ‘check result’ to calculate the assessment results. Results will appear at the bottom of the page. Users can approve or reject the results. Lastly, by clicking submit, data will be sent for verification.

8.10 Verification

All input data and other parameters, such as emission factors, methodology used, and the results of the calculations, are validated through a verification process. Validation is carried out by third-party verifiers created by the country admin. Verification page is accessible to sector admin, MRV admin and technical team. Once the quality check is completed by the QC team, assessments can be viewed on the verification page.

I. Send for verification



Sector admin, MRV admin, or technical team can log in to the system and select verification from the sidebar menu. By default, the GHG inventory page will appear. To view GHG impact and MAC assessments, the user needs to click 'impact and MAC' tab. Once the verification page is open, the user will see the list of climate actions and /or assessments that have been approved by the QC team. There are different options to select when sending the assessment for verification. When a user sees the button 'send', that assessment has not gone through verification yet. To start the process, user needs to click on 'send'. Before sending for verification, the user needs to explain any assumptions or approximations made on activity data, possible sources of error, how those were addressed, and any limitations of the input data in the "assumption" text box. Then the assessment can be sent for verification by clicking 'send for verification' button.

Assess Climate Actions ▾

Results

Verification

Methodologies

Reports

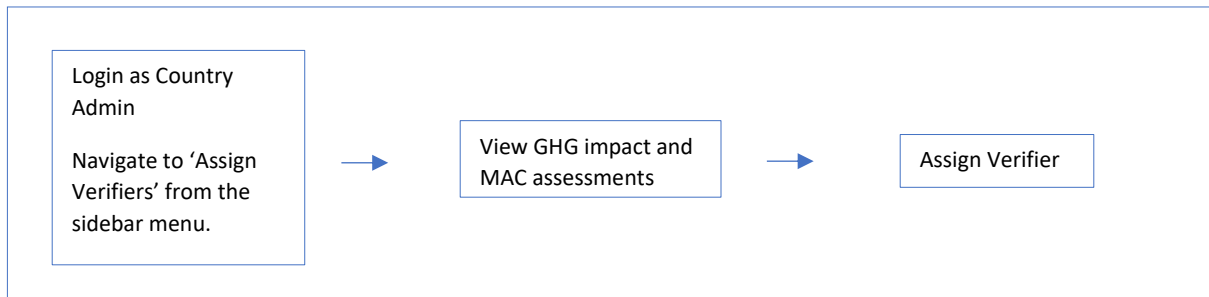
Pass	2022-06-08	View
Pending		Send

Assumption*

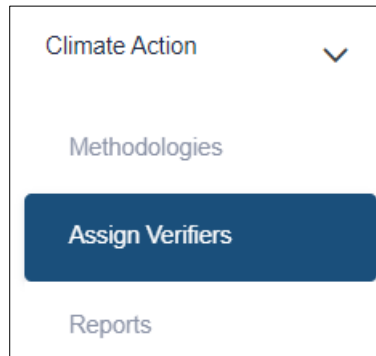
Please Enter Your Assumption here

BACK
SEND FOR VERIFICATION

II. Assign a verifier



Country admin can assign a verifier by clicking 'assign verifiers' from the sidebar menu. By default, the GHG inventory page will appear, and GHG impact and MAC assessments can be selected by clicking the 'impact and MAC' tab.



Then, climate action assessment (GHG impact or MAC) which needs to be verified must be selected and sent for verification together with the verification deadline.

<input type="checkbox"/>	Shift passengers from private vehicles to 23 public buses in Phnom Penh	Ex-post	2018	Pass	Paularita Seng	02-06-2022
<input checked="" type="checkbox"/>	Shift passenger from motor cars to 250 buses in Preah Sihanouk	Ex-post	2021	PreAssessment		

Showing 11 to 17 of 17 entries << < 1 2 > >> 10 ▾

Send Now

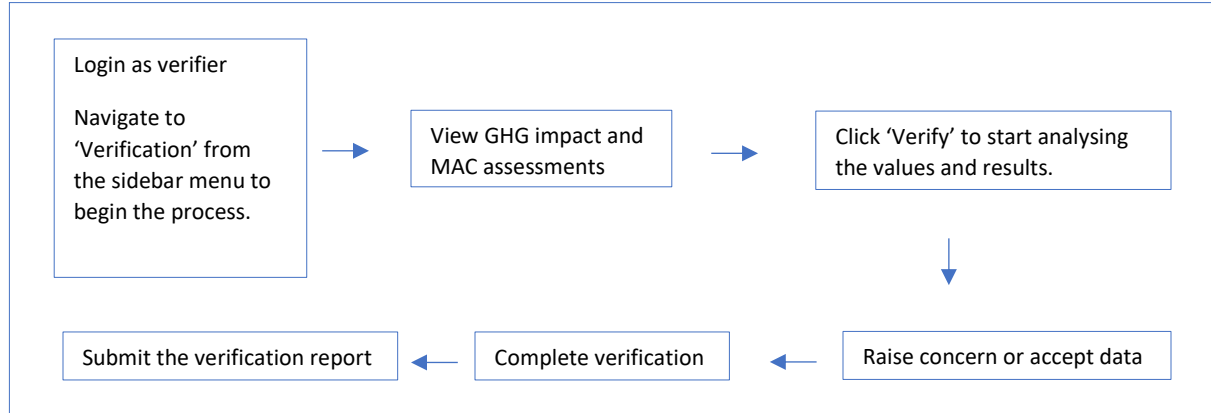
Assign Verifiers ×

Verifier

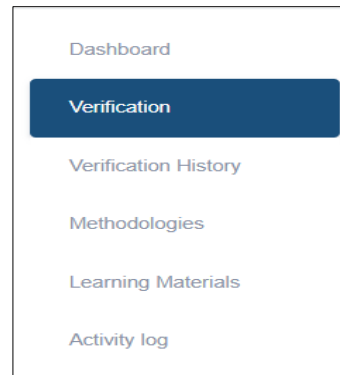
New Deadline

Send **Cancel**

III. Verification



The assigned verifier must first log in to the system and select 'verification' from the side bar menu. He/she can start the verification process by clicking 'verify'.



Climate Action	Assessment Type	Assessment Year	Verification Status	Verification Updated on	Verification Deadline
Passenger shift from car to buses in Kandy	MAC	2022	Pre Assessment		2023-06-22

The verifier needs to analyse and evaluate the values used for each parameter and the results obtained. The verifier can 'raise concern' or 'accept' the information received by selecting all parameters and values that appear for the assessed climate action.

Project Parameter Accept

250 buses

Parameter	Accepted	Data Provider	Activity Data	Unit	Info
<input checked="" type="checkbox"/> Fuel consumption - Diesel-bus	×	General Department of Land Transport	3397	t/y	Raise Concern ⋮
<input checked="" type="checkbox"/> Average trip distance of the passenger of the project activity in year y - Common	×	General Department of Land Transport	10	km	Raise Concern ⋮
<input checked="" type="checkbox"/> No of passenger transported per year - Common	×	General Department of Land Transport	61857894	passenger/y	Raise Concern ⋮
<input checked="" type="checkbox"/> CO2 emission factor - Diesel	×	N/A	74.1	t-CO2/MWh	Raise Concern ⋮
<input checked="" type="checkbox"/> Net calorific value - Diesel	×	N/A	0.042	TJ/t	Raise Concern ⋮

Raise Concern ×

Non Conformance No :1 Area : No of passenger transported by the project per year - Common Date :2023-05-17

Observation

COMPLETE

If the verifier needs to raise concern/s, the respective parameter/s need to be selected first. Then, the concern can be mentioned in the space given under observation, and it can be finished by clicking 'complete'.

Once the above steps are completed, the verifier can either accept or raise concerns regarding the assumptions provided by the sector admin, technical admin, or MRV admin. Finally, he/ she can click on "report" to proceed.

Assumption

Please Enter Your Assumption here

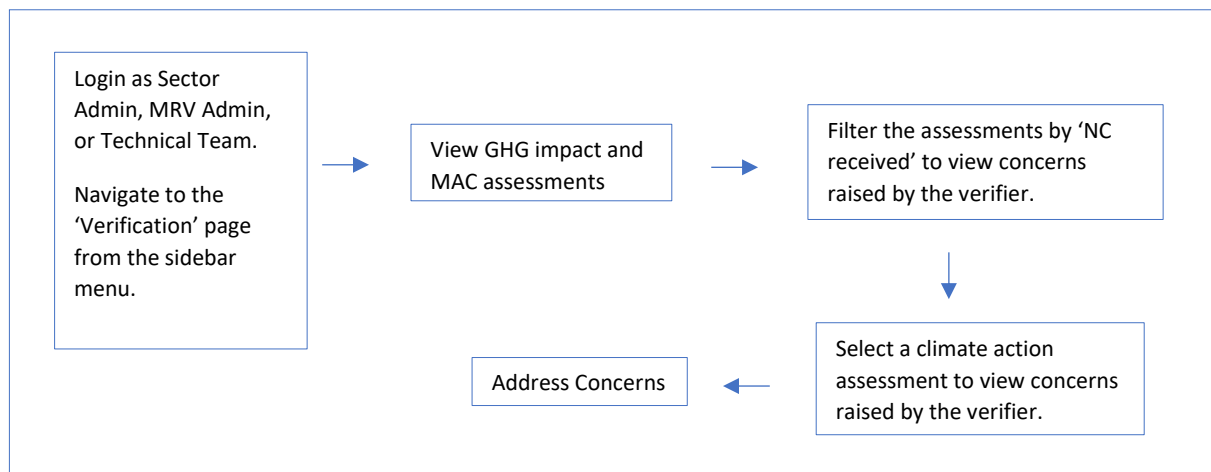
Accept
Raise Concern

BACK
REPORT

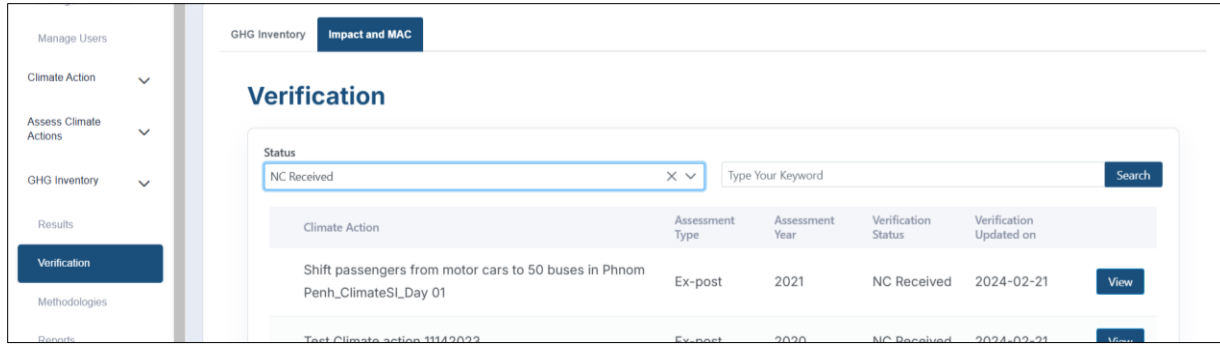
Once the verification report appears, the verifier needs to click ‘submit’ to send the results back to the sector/technical/MRV admin. The verification report can also be downloaded. If any concerns were raised, those will appear in the report.



IV. Address concerns raised by verifiers

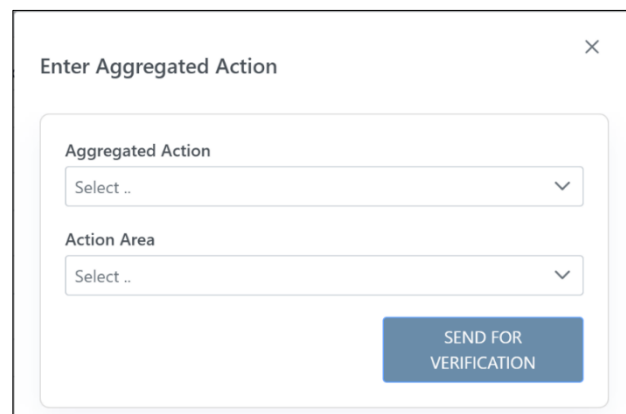
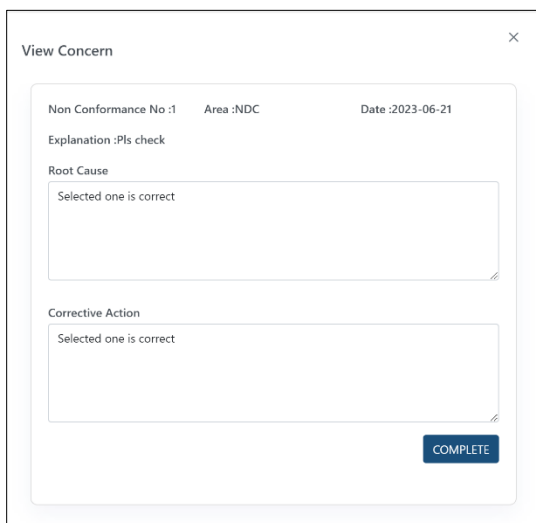
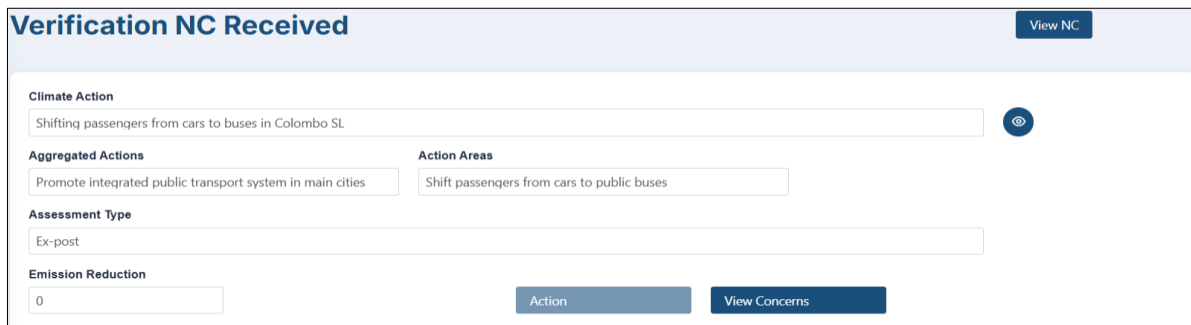


Sector admin, technical admin or MRV admin can start addressing the verifier's concerns by clicking the ‘verification’ button in the side menu. GHG inventory page will appear, and for GHG impact and MAC assessments, ‘impact and MAC’ tab should be selected. Then, the assessments can be filtered by ‘non-conformity (NC) received’ status. The desired climate action assessment can be selected and viewed.



a. Concerns raised for aggregated actions.

If a concern is raised for an aggregated action, it can be viewed by clicking the ‘view concern’ button. In the boxes provided, ‘root cause’ for the raised concern must be added. If corrective action is taken for the identified cause, that can be mentioned in the given box, and the ‘complete’ button must be clicked. If a previously selected aggregated action needs to be changed, ‘action’ button needs to be selected. Then, the appropriate "aggregated action" and "action area" must be selected from the drop-down menu and send them back for verification.



b. Concerns raised for the methodologies.

If verifier has raised concerns for the methodology, assessment will automatically be marked as failed. Therefore, no corrective action can be taken.

Non - Conformance Report

Verification Round	Pre-Assessment
Date Generated	2023-06-21
Verifier	verifier@mailo.icu
Institution	Department of Transport

Non Conformance Round 1 **Area : Methodology** [Edit](#)

Explanation Applicability criteria of this methodology does not tally with the selected climate action

Root Cause

Corrective Action

Action

Status of the assessment: Fail

[Submit](#) [Download](#) [Back](#)

c. Concerns raised for activity data collected from a data-providing institution

If a concern is raised for activity data collected from a data-providing institution, that concern can be viewed by clicking the ‘view concern’ button.

Fuel consumption - Diesel-bus	City Bus Authority	242.7	t/y	Action	View Concern	⋮
-------------------------------	--------------------	-------	-----	------------------------	------------------------------	---

In the given boxes, the ‘root cause’ for the raised concern can be added. If a corrective action is taken for the identified cause, it can be mentioned in the box provided in the system.

View Concern
✕

Non Conformance No: 1 Area : Net calorific value - Petrol Date: 2023-06-01

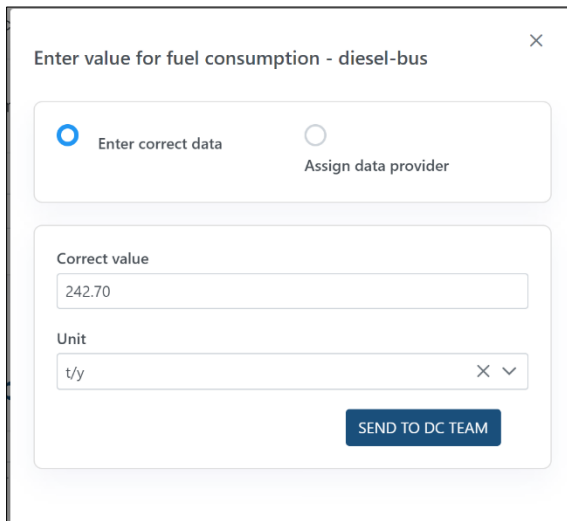
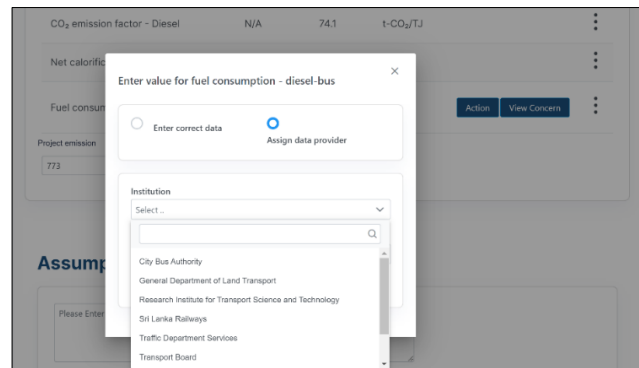
Explanation :Country specific values are available, pls use that

Root Cause

Corrective Action

[COMPLETE](#)

There are two options to take action regarding the concern raised by the verifier. The first option is to change the data by clicking ‘enter correct data’. Alternatively, data can be collected again from a data-providing institution by clicking ‘assign data provider’. Once the required action is taken, it can be sent to the data collection team by clicking ‘send to DC’. Once data are sent to the data collection team, they will be sent to QC and verification. If a data request is generated by adding a new data providing institution, it will be sent to respective data providing institution through the data collection team and normal data collection process will be initiated.

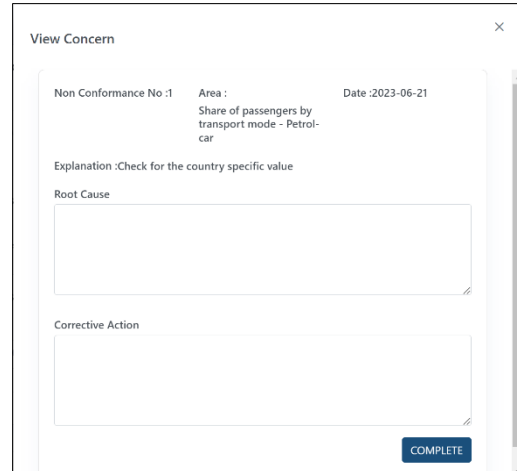
d. Concerns raised for historical data/default data

If a concern is raised for default/historical data from a data-providing institution, the user can click the ‘view concern’ button, and it will indicate the concern raised by the verifier.

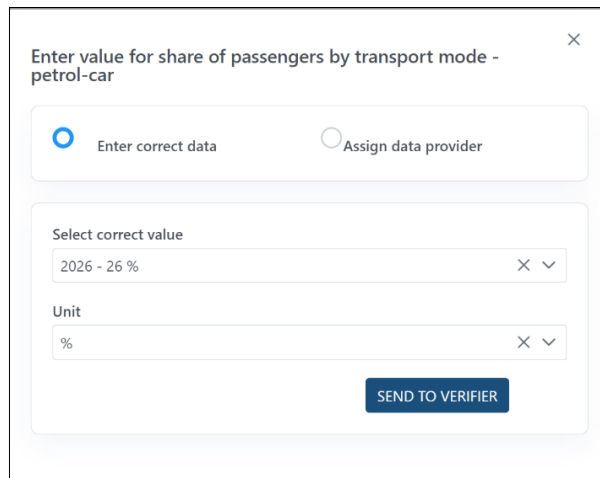
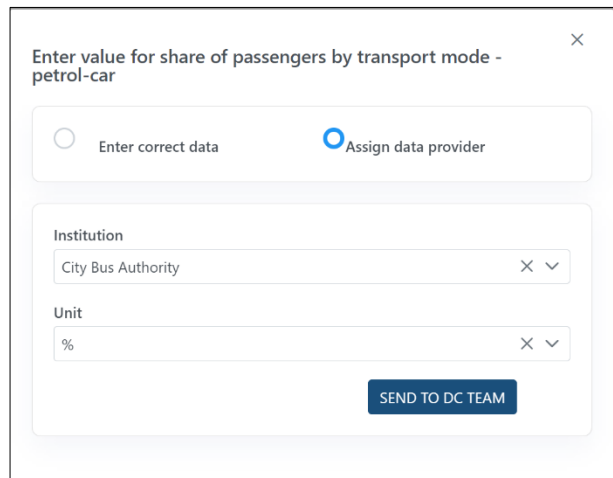
Share of passengers by transport mode - Petrol-car	N/A	26	%	Action View Concern
----------------------------------------------------	-----	----	---	-----------------------------------------------------

In the given box, the ‘root cause’ for the raised concern can be added. If a corrective action is taken for the identified cause, it can be mentioned and can be finished by clicking ‘complete’ button.

Two options are available to take corrective action. Firstly, under the 'enter correct data' option, a value from the available list of 'historical data' or 'default data' can be selected. After making the selection, the data will be sent directly to the verifier for confirmation.



Secondly, user can select a data providing institution through ‘assign data provider’ button. Once data providing institution is selected, data request can be sent to the data collection team. This starts the normal data collection process.

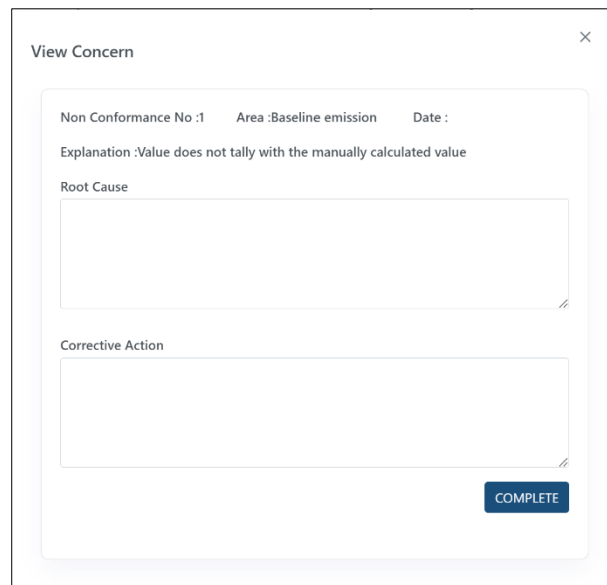
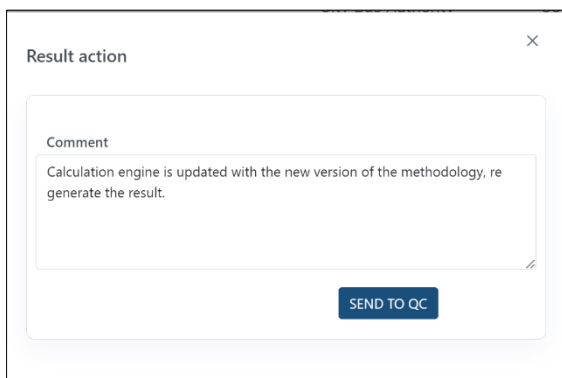
e. Concerns raised about results.

If a concern is raised for results, it can also be viewed by clicking the ‘view concern’ button.



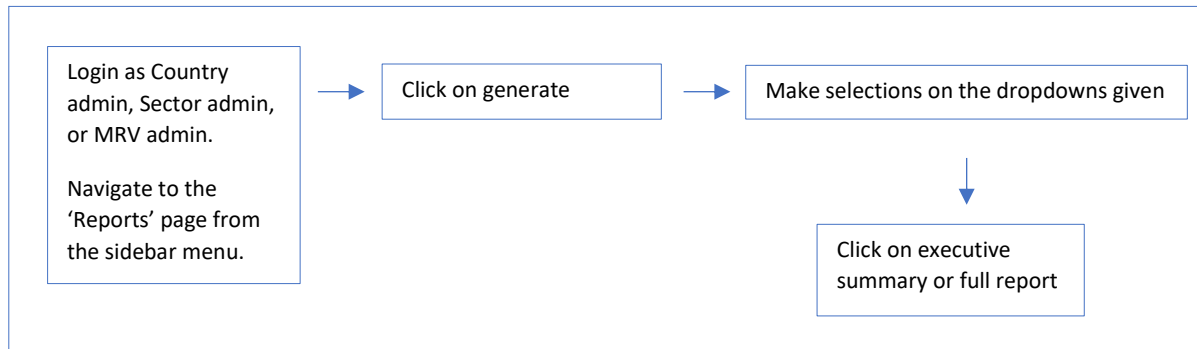
As in the above concerns, the ‘root cause’ for the raised concern can be added to the box provided in the system. If corrective action is taken for the identified cause, that can be mentioned in the given box and ‘complete’ the process

Once the country admin or sector admin agrees, the calculation engine of the system will need to be reviewed and updated with the support of the system developers. After the calculation engine is updated, sector admin can click the 'action' button. This will open a pop-up where the user can add a comment, allowing QC to regenerate the results.

If users resolve all the concerns within the three rounds of the verification, (pre-assessment, initial assessment, final assessment), assessment will be flagged as ‘pass’ and will be ready for report preparation. However, if users are unable to resolve the issues raised within these three rounds, assessment will be marked as ‘fail’.

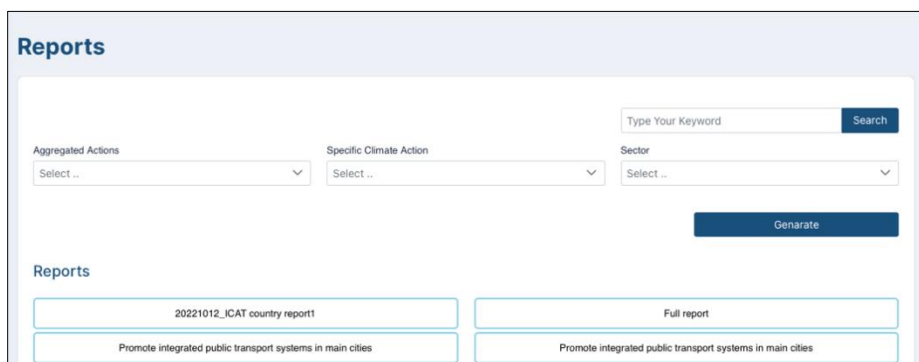
8.11 Reports generation



Country admin, sector admin and MRV admin can produce the following reports from the tool.

- Executive summary of the assessment
- Full report based on selected aggregated actions

Executive summary report includes the name of aggregated actions, name of climate action, Year, type of assessment, emission reduction/MAC values and a graph to indicate the emissions reduction target. Full report includes the executive summary report, system boundary, methodology details, Parameters, activity data and so on. Country admin, sector admin or MRV admin can log in to the system and select 'reports' from the side bar menu. Climate actions that need to be included in the report can be selected, and a report can be generated.



Reports can be customizable according to;

- sector
- aggregated action
- climate action
- assessment type and
- Year

Select Sector/(s)* Select All Sectors

Select Aggregated Actions*

Climate Action*

Select Assessment Type*

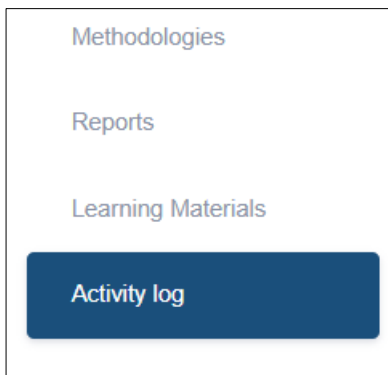
Select Year/(s)*

Report Name*

An executive summary or full report can be generated by clicking respective buttons. The full report can be downloaded in PDF format, and the executive summary can be printed as a PDF file.

9. Activity log

All users of the system can see the activities of each user by selecting activity log from the side bar menu.

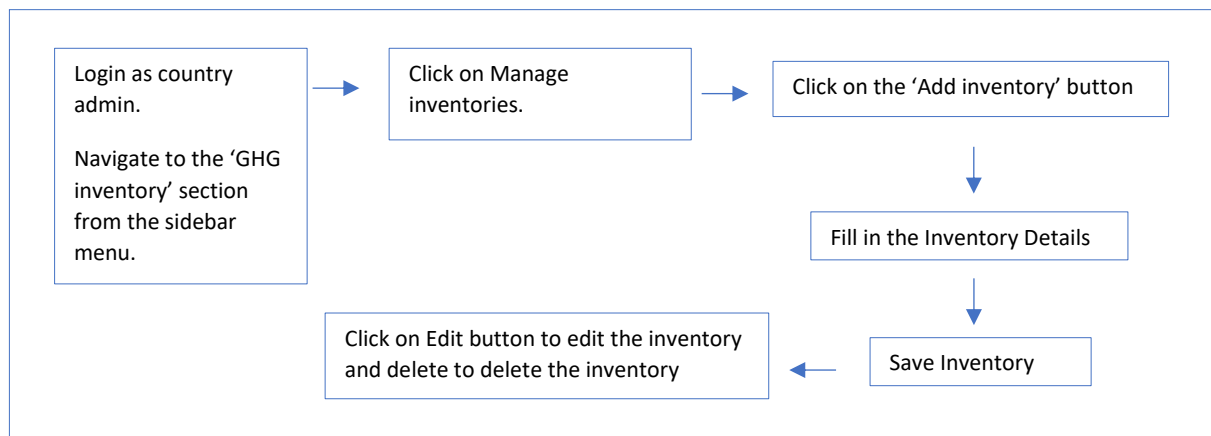


Name	User Type	Activity	Date	Time	Status
Chea Monykoran	Sector Admin	datijig142@nifect.com Logged In	28-07-2022	12:04:13 PM	Log In
Chea Monykoran	Sector Admin	datijig142@nifect.com Logged In	28-07-2022	10:02:32 AM	Log In

10. Greenhouse gas inventory interface

The GHG inventory interface enables the creation, management, and assessment of GHG inventories. Assessments can be conducted by selecting emission sources from the transport and waste sectors and providing necessary data. Data can be collected from institutions through the data collection process. Collected data can also be exported and they are compatible with the IPCC software.

10.1 GHG inventory management



Country admin is responsible for managing GHG inventories.

I. GHG inventory creation

To create a GHG inventory, the user must navigate to the ‘GHG inventory’ section and click ‘manage inventories’ in the sidebar. The user can start to create a new inventory by clicking ‘add inventory’ button.



The region and country fields will be automatically set according to the logged-in location. Next, the user needs to give the inventory a name and select the inventory year, the base year, the appropriate global warming potential (GWP) value selection guideline and the Intergovernmental Panel on Climate Change (IPCC) guideline that applies to the inventory. Optionally, a description can be added to provide more context for the inventory.

Add Inventory

Inventory Name*

Region*

Country*

GHG Inventory Year*

Base Year*

GWP Value Selection Guideline*

IPCC Guideline*

Description of the inventory

Once all the details are filled in, the data can be saved by clicking the ‘create inventory’ button. Newly created inventory will appear in the inventory table and can be viewed and managed. The created inventory can be filtered by inventory year or GHG inventory guideline to find entries.

Manage Inventories

GHG Inventory Year

GHG Inventory Guideline

Date Created	Inventory Name	Inventory Year	Base Year	GWP Value Selection Guideline	GHG Inventory Guideline	
03/12/2024	Inventory for cambodia	2018	2006	AR5	2006_IPCC	<input type="button" value="Export"/> <input type="button" value="✎"/> <input type="button" value="🗑️"/> <input type="button" value="Assessments"/>
04/12/2024	Inventory for 2024	2024	1996	AR5	2006_IPCC	<input type="button" value="Export"/> <input type="button" value="✎"/> <input type="button" value="🗑️"/> <input type="button" value="Assessments"/>

Showing 1 to 2 of 2 entries << < 1 > >> 10 ▾

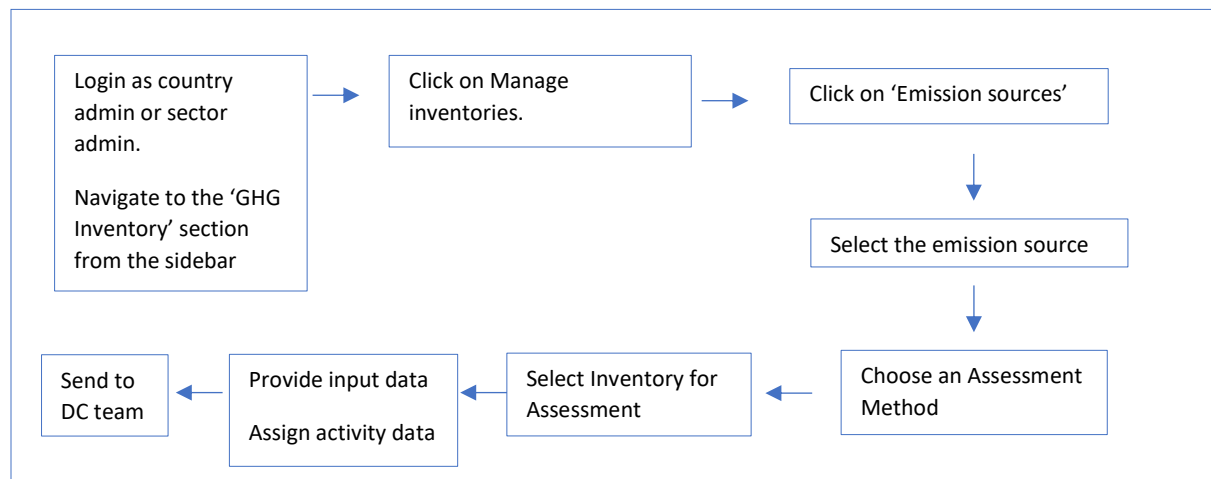
II. Delete GHG inventory

To delete an inventory, the user needs to click delete button next to the relevant inventory in the table. The user needs to click ‘yes’ in the popup menu to confirm the deletion. Once the inventory is successfully deleted, a notification will appear confirming the deletion.

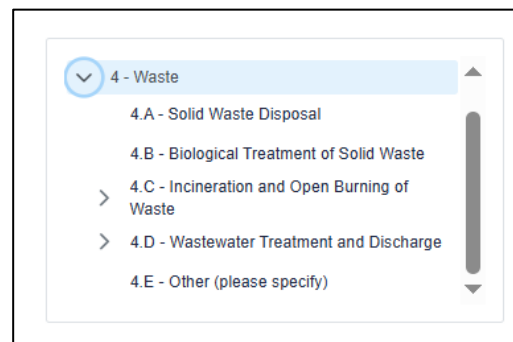
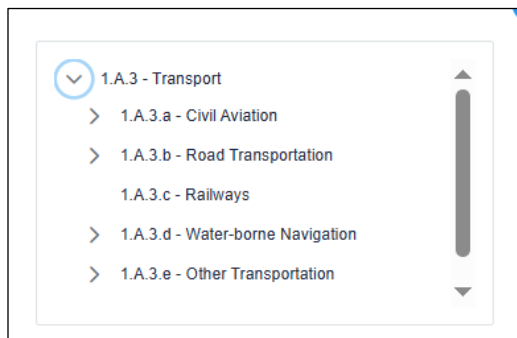
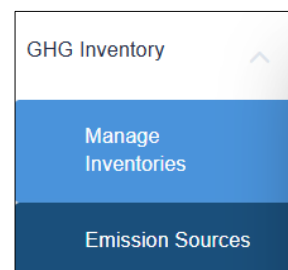
III. Edit GHG inventory

An inventory can be edited by clicking the edit button next to the relevant inventory in the table. Details of the inventory will be loaded, and the changes can be made through the edit inventory icon.

10.2 GHG inventory assessment



GHG inventory assessment can be done by country admin or sector admin. To assess a GHG Inventory, the user must navigate to the GHG inventory section and click 'emission sources' in the sidebar. A popup will appear, displaying a list of emission sources. The user then needs to expand the list and select the emission source he/she wishes to assess.



Once the assessment page is opened, details related to the selected emission source will be shown. The user can then select 'Tier 1' from the available options. (only Tier 1 is currently added). Next, the inventory that the user wishes to assess from the provided list should be selected.

Add GHG inventory assessment

Sectors	<input type="text" value="1.A.3 - Transport"/>
Category level one	<input type="text" value="1.A.3.a - Civil Aviation"/>
Emission source	<input type="text" value="1.A.3.a.i - International Aviation (International Bunkers)"/>
Tier	<input style="border-bottom: 1px solid #ccc;" type="text" value="One"/>
Inventory	<input style="border-bottom: 1px solid #ccc;" type="text" value="Inventory for cambodia"/>

There are two types of data required for the GHGI assessment.

1. **Input data:** The user needs to either manually fill in the information or select values from dropdown menus.
2. **Activity data:** These data need to be assigned to the relevant institutions.

Required information must be completed to ensure that the activity data is properly assigned for the accuracy of the assessment.

Fuel Consumption Data +

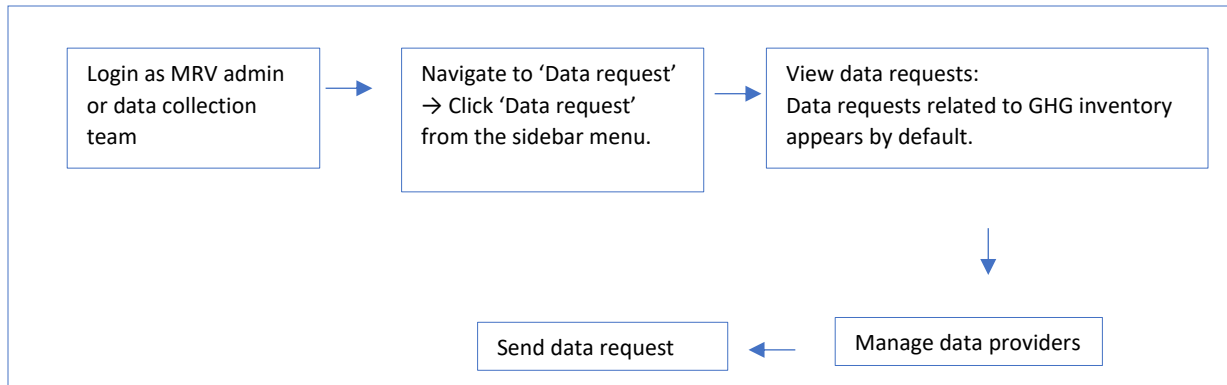
Subdivision*	<input type="text" value="Subdivision 1"/>	-
Fuel types*	<input style="border-bottom: 1px solid #ccc;" type="text" value="Liquid Fuels"/>	
Fuel*	<input style="border-bottom: 1px solid #ccc;" type="text" value="Aviation Gasoline"/>	
Consumption (Mass)*	<input style="border-bottom: 1px solid #ccc;" type="text" value="Ceylon Petroleum Corporation"/>	
Consumption unit*	<input style="border-bottom: 1px solid #ccc;" type="text" value="Gg (Auto CF)"/>	

Other Data +

Amount captured (Gg CO2)	<input style="border-bottom: 1px solid #ccc;" type="text" value="City Bus Authority"/>	-
--------------------------	----------------------------------------------------------------------------------------	---------------------------------------------------------------------

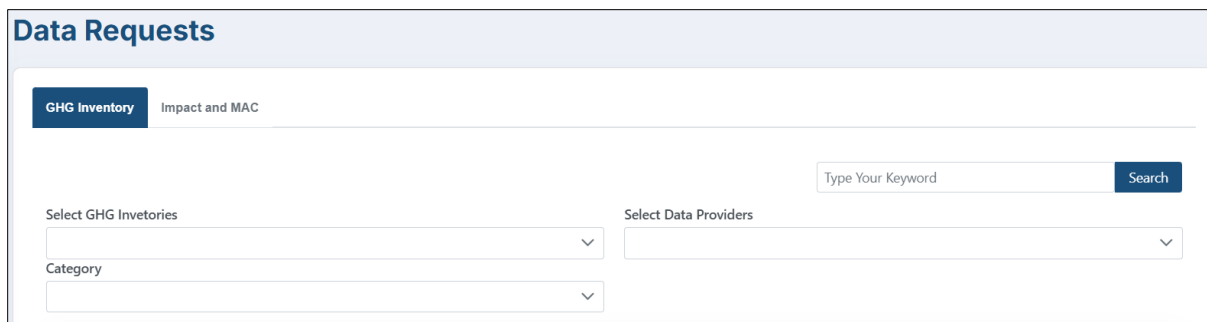
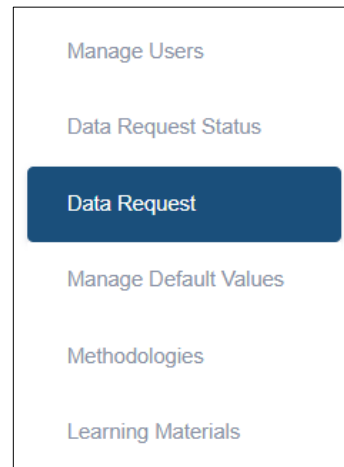
User can click on the plus (+) button to add multiple records and minus (-) button to remove the records. After completing the required data and assigning activity data, the request can be sent to the data collection team.

10.3 Send data requests



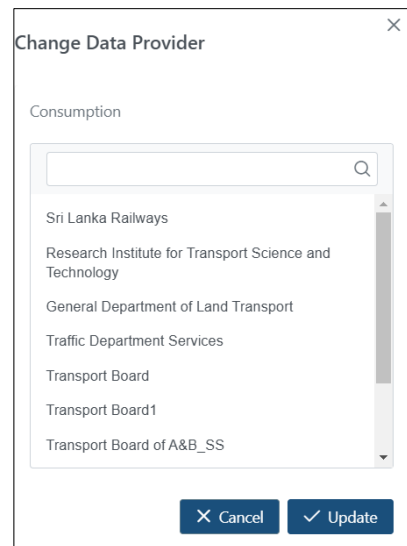
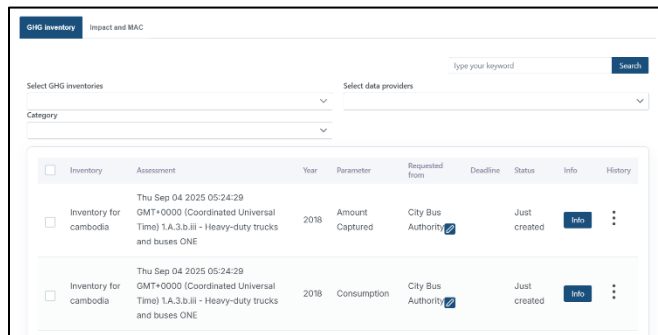
To carry out this function, MRV admin or data collection team must select 'data request' on the side bar menu. GHG inventory page will appear, and data requests will be shown. Users can filter the data requests using the following criteria.

- **Inventory:** Filter requests based on the associated inventory.
- **Categories:** Narrow down requests by emission source categories.
- **Data provider:** Filter requests by the organization or institution providing the data

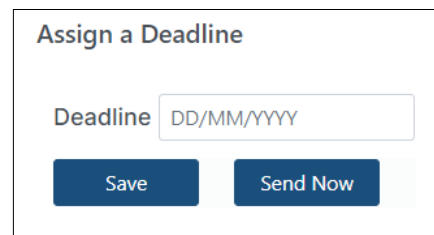


User can click 'info' button in each data request to view the assessment information associated with that data request. This provides detailed insights into the assessment related to the request.

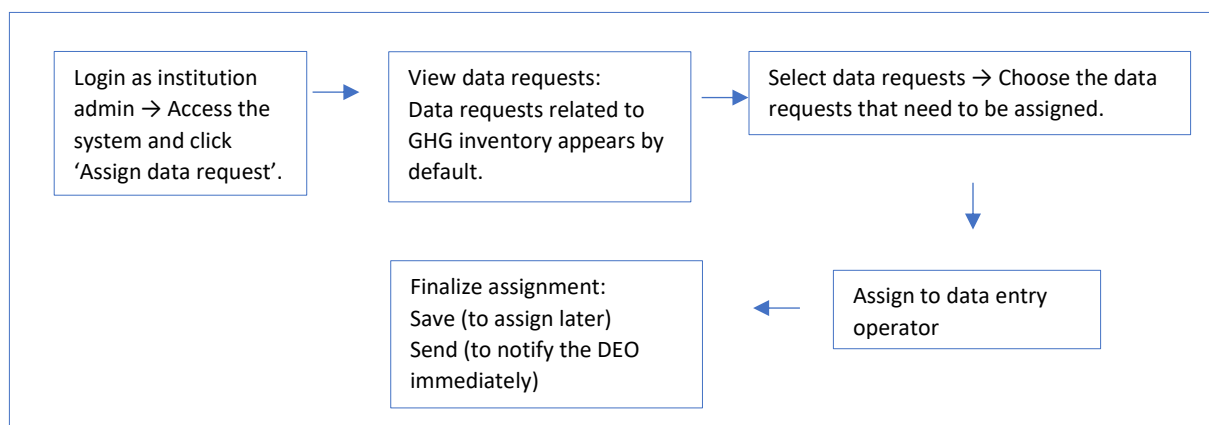
MRV admin or data collection team can accept the suggested data provider or change it. Data-provider can be modified by using edit icon. And the changes can be saved by clicking 'update' button.



All the data requests can be sent by using the 'request' button with a deadline to submit data. Request can be saved and sent later, or request can be sent by selecting 'send now'.



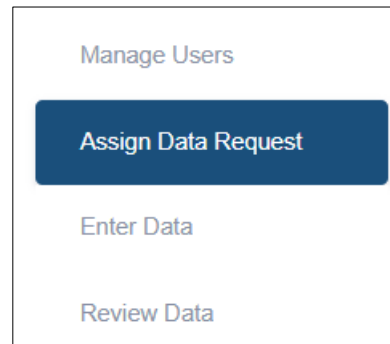
10.4 Assign data requests



This feature is used by the institution admin in the data-providing institution to assign the data request to the responsible data entry operator sent by the data collection team.

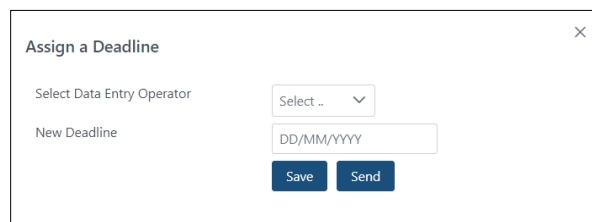
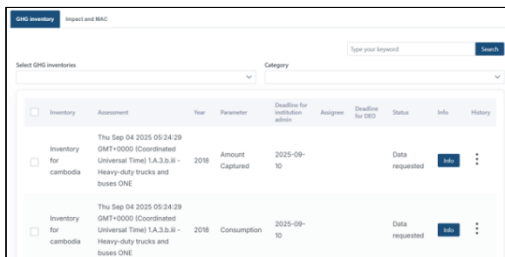
The institution admin must first log in to the system and click on ‘assign data request.’ GHG Inventory page will appear, and the data requests will be shown. Data requests can be filtered by using the following criteria:

- **Inventory:** Filter requests based on the associated inventory.
- **Categories:** Narrow down requests by emission source categories.

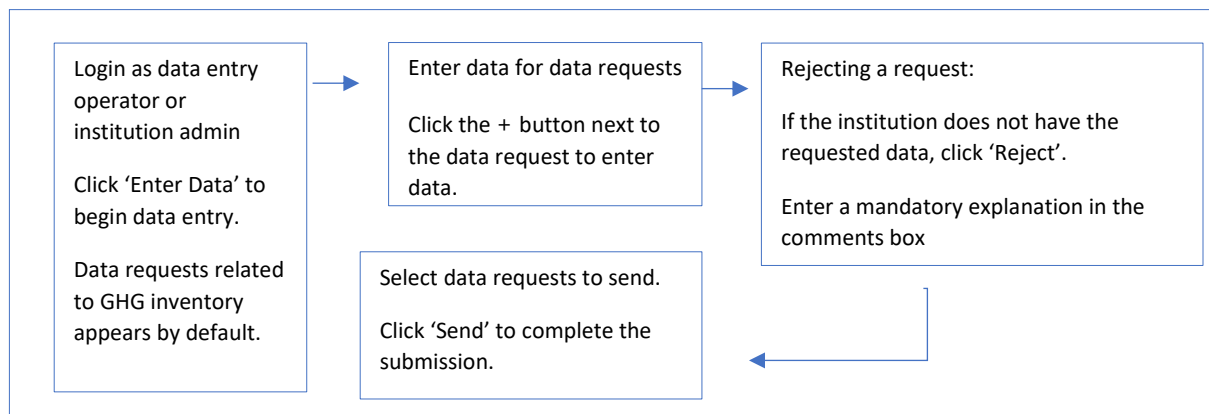


User can click on the ‘Info’ button in each data request to view the assessment information associated with that data request. This provides detailed insights into the assessment related to the request.

Institution admin must select activity data to be assigned to the relevant data entry operator within the data provider institution, set a deadline and click ‘send’ to send the request.



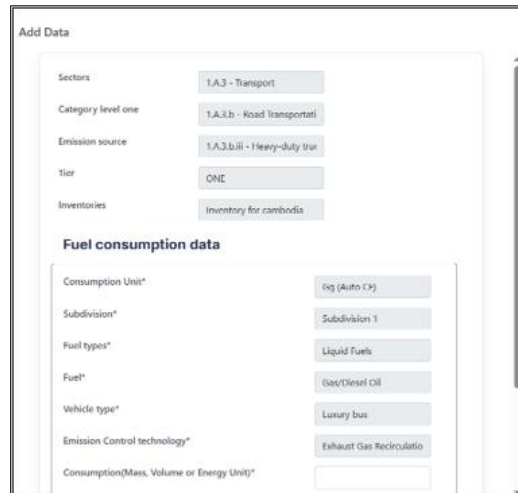
10.5 Data entry



Data entry operator or institution admin can complete the data request for the parameters needed for the assessment. Once the user clicks the ‘Enter data’ tab, GHG inventory page will appear, and the data requests will be visible. Data requests can be filtered by using the following criteria.

- **Inventory:** Filter requests based on the associated inventory.
- **Categories:** Narrow down requests by emission source categories.

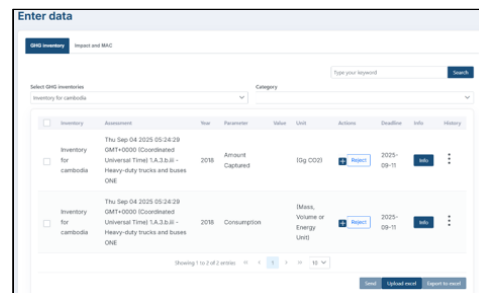
Data entry can be started by clicking the plus (+) button next to the parameter to which the data need to be entered. Once the data are entered, they can be saved, sent, or cancelled. If the institution doesn’t have the requested data for a particular parameter, this request can be rejected with an explanation in the comments box.



The 'Add Data' form is divided into two main sections. The top section allows for hierarchical selection of parameters: Sectors (1.A.3 - Transport), Category level one (1.A.3.b - Road transport), Emission source (1.A.3.b.iii - Heavy-duty truck), Tier (ONE), and Inventories (Inventory for Cambodia). The bottom section, titled 'Fuel consumption data', contains several fields: Consumption Unit* (e.g. (Auto (3)), Subdivision* (Subdivision 1), Fuel types* (Liquid Fuels), Fuel* (Gas/Diesel Oil), Vehicle type* (Luxury bus), Emission Control technology* (Exhaust Gas Recirculation), and Consumption(Mass, Volume or Energy Unit)*.

Enter data offline

Data can be entered offline by selecting a parameter from the list and clicking ‘export to excel’. An excel file will be downloaded with the selected parameters, and data can be entered to the excel and uploaded back to the tool by clicking on the ‘upload excel’ button.

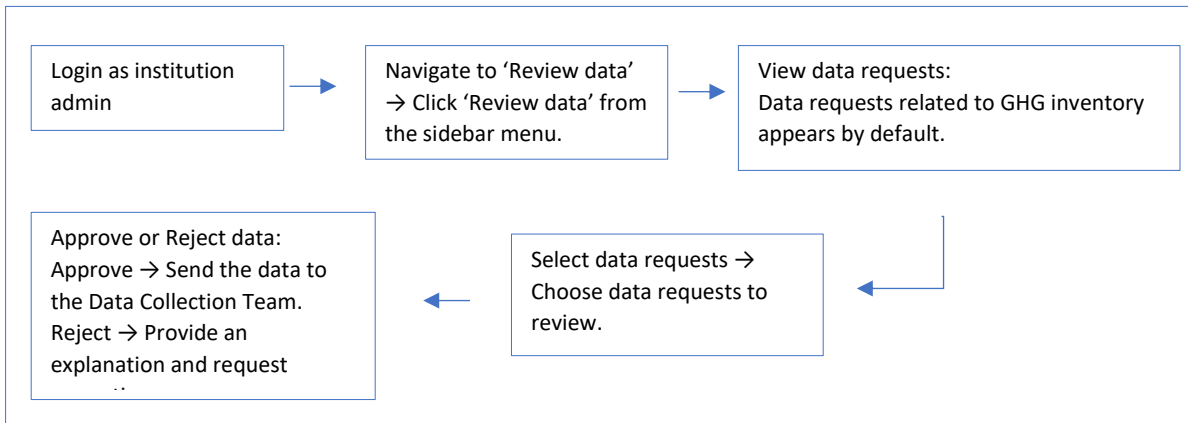


The 'Enter data' interface features a table with the following columns: Inventory, Assessment, Year, Parameter, Value, Unit, Actions, Deadline, and History. The table contains two rows of data for the year 2018, both with an assessment date of 'Thu Sep 04 2025 05:24:29'. The first row is for 'Inventory for Cambodia' with parameter 'Amount Captured' and unit 'Gg CO2e'. The second row is for 'Inventory for Cambodia' with parameter 'Consumption' and unit 'Mass, Volume or Energy Unit'. Each row has a 'Send' button and a 'History' link. At the bottom, there is a pagination control showing 'Showing 1 to 2 of 2 entries' and buttons for 'Send', 'Upload excel', and 'Export to excel'.

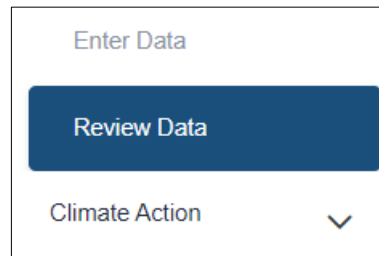
Send data

The user can send all the parameters at once or one by one. It depends on the user's selection.

10.6 Review data



Institution admin can login to review the data entered by the data entry operator, approve and send the data to the data collection team or reject it. Institution admin must first select 'review data' from the side bar menu and the entered data will appear.

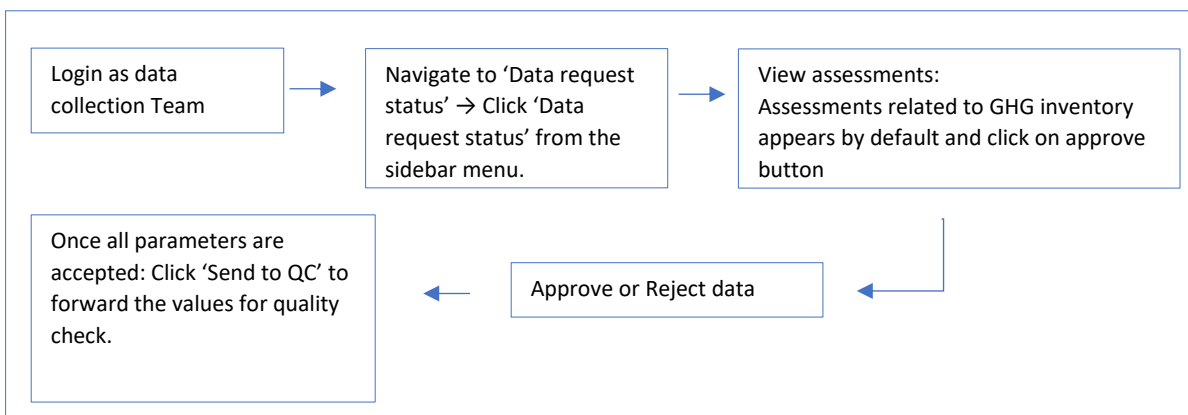


Then, the parameters that need to be reviewed must be selected. Finally, they can be accepted or rejected.

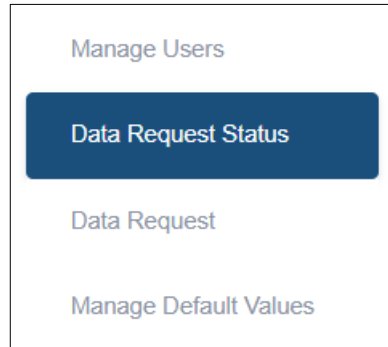
Inventory	Assessment	Year	Parameter	Value	Unit	Assigned	Deadline for data	Created on	Info	History
The Day 04 2025										
<input type="checkbox"/>	Inventory for camboodia ONE	2018	Amount Captured	2	0kg CO2e	2025-09-15	2025-09-04		Approve	
The Day 04 2025										
<input type="checkbox"/>	Inventory for camboodia ONE	2018	Consumption	100	MWh, Volume or Energy Unit	2025-09-15	2025-09-04		Approve	



10.7 Approve data



Data collection team must select data request status from the side bar menu. In the GHG inventory page, all the data collection assessments will appear. The data collection team can then approve them by clicking approve button on the relevant assessment.



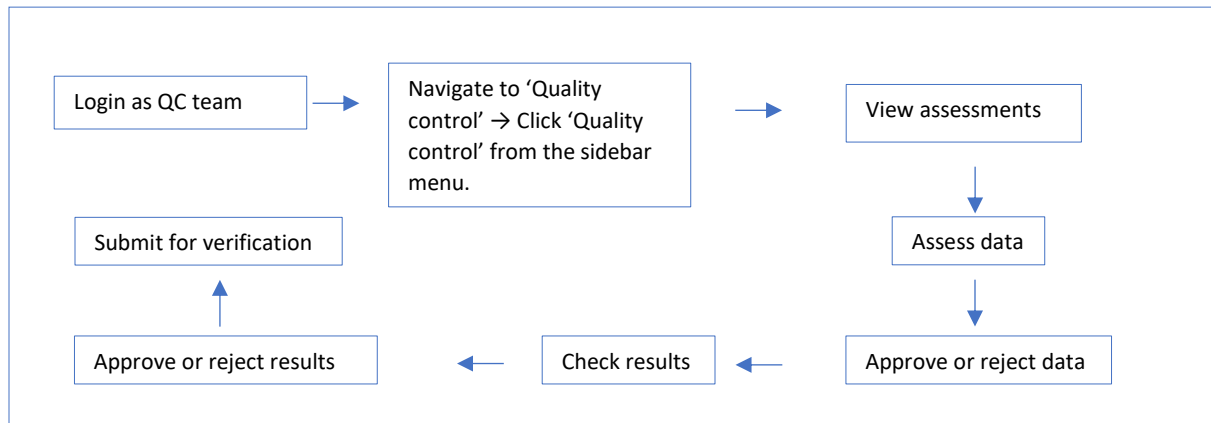
Then, all the activity data parameters that came back from the data provider institution must be selected and accepted or rejected. If a parameter gets rejected, it will be sent back to the data provider institution. A comment should be included to explain the data provider institution why the user has rejected the value provided.

<input checked="" type="checkbox"/>	Parameter	Data Provider	Value	Unit	Status	Info
<input checked="" type="checkbox"/>	Consumption	City Bus Authority	34332	(Mass)	Pending	Info ⋮
<input checked="" type="checkbox"/>	Amount captured	City Bus Authority	34	(Gg CO2)	Pending	Info ⋮

Showing 1 to 2 of 2 entries << < 1 > >> 10 ▾

Data collection team can select all the accepted parameters or analyse them one by one. The user can click on the Info button in each data request to view the assessment information associated with that data request. This provides detailed insights into the assessment related to the request. Once all the parameters have been accepted, the data collection team will send the values to the Quality Control (QC) Team to perform the quality check.

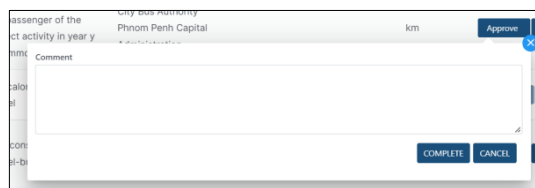
10.8 Quality control



Quality control team can select the ‘quality control’ tab from the sidebar. The menu that appears contains the assessments that were sent for quality check. Different buttons will appear. The ‘view’ button appears for quality check that has already been passed, and only the details of the result can be viewed. Quality check assessment can be done by clicking ‘check’ button. Once the assessment is done the QC team can accept or reject the parameter.

08-06-2022	Pass	View
10-06-2022	Fail	Check
31-07-2022	Pending	Check

If a parameter gets rejected, that parameter will be sent back to the data collection process.

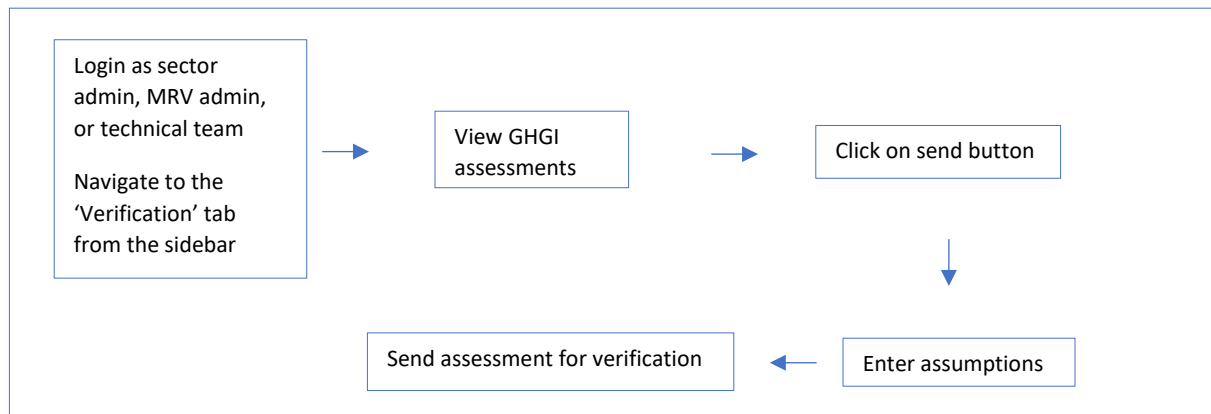


When the assessment is completed, approval will be done by clicking ‘complete.’ Once all the parameters are accepted, they can be submitted.

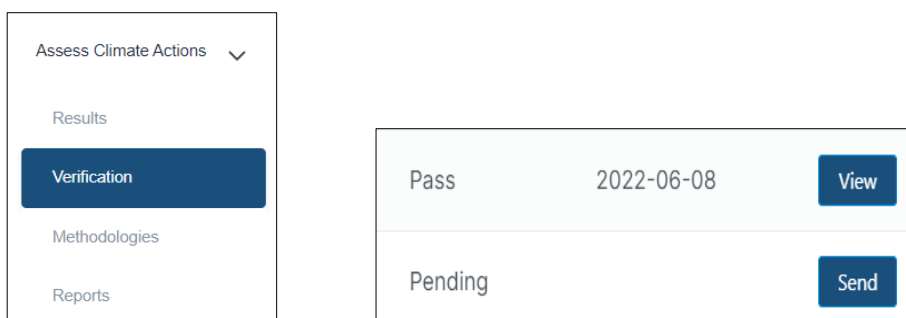
10.9 Verification

All input data are validated through a verification process carried out by third-party verifiers created by the country admin. Verification page is accessible to sector admin, MRV admin and technical team. After data quality control is completed, assessments can be viewed on the verification page.

I. Send for verification



Users must first log-in and select verification from the sidebar menu. Then the data collection assessments that have been sent to verification will appear in the GHG inventory verification page. When the verification page is open, the user will see the list of GHGI data collection assessments that need to undergo the verification process. When users see the button ‘send’, that assessment has not gone through verification yet.



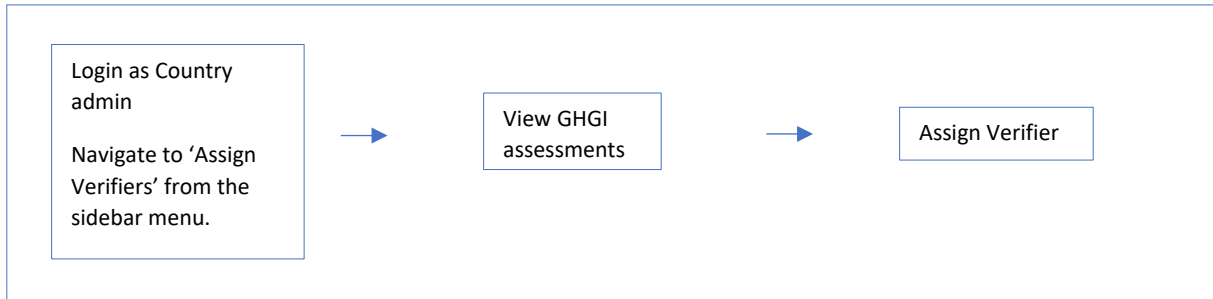
When sending data for verification, some information, such as any assumptions or approximations made on activity data, possible sources of error and how those were addressed, and any limitations of the input data, need to be stated in the “assumption” text box. Then, the data can be sent for verification.

Assumption*

Please Enter Your Assumption here

BACK
SEND FOR VERIFICATION

II. Assign a verifier



Country admin can assign a verifier by clicking on 'assign verifiers' from the sidebar menu. On the GHG inventory page, data collection assessments that have been sent for verification will be shown.



Then GHGI data collection assessment which needs to be verified should be selected. A verifier must be selected and send for verification along with a deadline to complete the verification process.

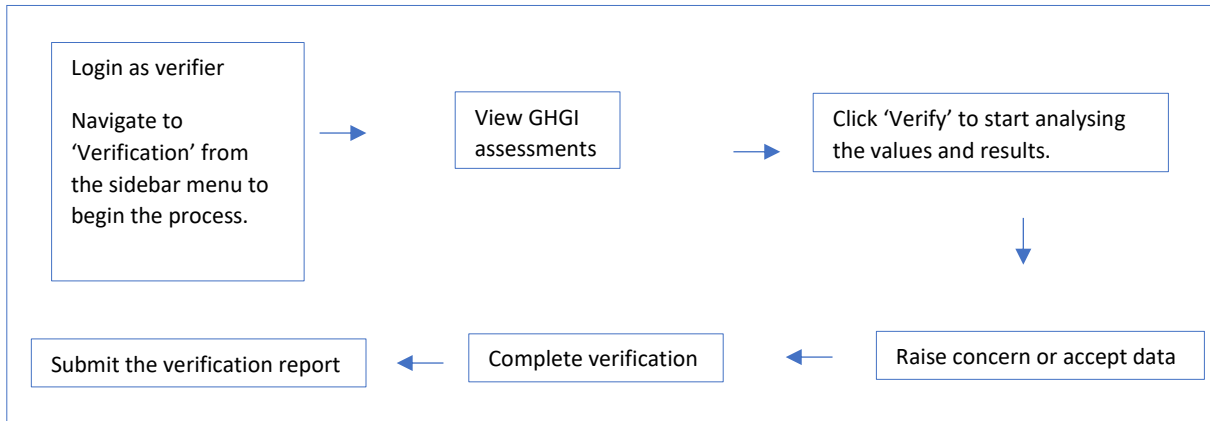
<input type="checkbox"/>	Inventory for cambodia	Thu Sep 04 2025 05:24:29 GMT+0000 (Coordinated Universal Time) 1.A.3.b.iii - Heavy-duty trucks and buses ONE	2018	Pre Assessment
--------------------------	------------------------	--------------------------------------------------------------------------------------------------------------	------	----------------

Assign Verifiers ✕

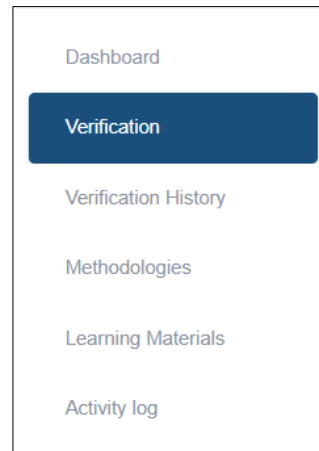
Verifier

New Deadline

III. Verification



The verifier can log into the system and select verification from the side bar menu. Data collection assessments that have been sent to the verifier will appear. GHGI assessments can be filtered by the status.



The verifier can click the 'verify' button and start the verification process.

Inventory	Assessment	Assessment year	Verification updated on gg	Verification deadline	Status
Inventory for cambodia	Thu Sep 04 2025 05:24:29 GMT+0000 (Coordinated Universal Time) 1.A.3.b.iii - Heavy-duty trucks and buses ONE	2018	2025-09-04	2025-09-11	Pre assessment <input type="button" value="Verify"/>

The verifier can analyse and evaluate the values used for each data request obtained for the assessment. The verifier can raise concern or accept the information received by selecting all parameters.

<input type="checkbox"/>	Parameter	Depends On	Accepted	Data Provider	Activity Data	Unit	Info
<input type="checkbox"/>	Consumption	Non dependant	×	City Bus Authority	34000	(Mass)	<input type="button" value="Raise Concern"/> <input type="button" value="Info"/>
<input type="checkbox"/>	Amount captured	Non dependant	×	City Bus Authority	20	(Gg CO2)	<input type="button" value="Raise Concern"/> <input type="button" value="Info"/>

Showing 1 to 2 of 2 entries << < 1 > >> 10 ▾

Raise Concern ✕

Non Confirmation Round: Round 1

Area: Consumption Date: Fri Dec 20 2024 10:56:01 GMT+0530 (India Standard Time)

Observation

If the verifier needs to raise concern/s, he/she must select the respective parameter first. After selection, the concern can be added in the designated space under observation and marked as complete. Once this step is completed, the verifier can also accept or raise concerns regarding the assumptions submitted by the sector admin, technical admin, or MRV admin. The verification process can be finalised by clicking on 'report'.

Assumption

Please Enter Your Assumption here

Once the verification report appears, the verifier needs to click on 'submit' to send the results back to the sector, technical, or MRV admin. If needed, users can also download the verification report by clicking 'download' button. If concerns are raised, those will be displayed in this report.

Non - Conformance Report

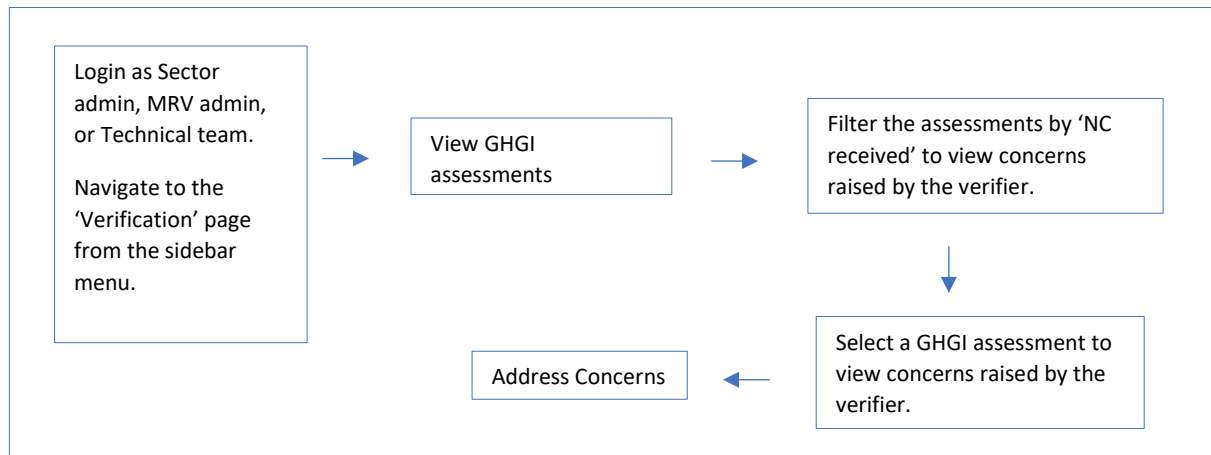
Verification Round	Pre-Assessment
Date Generated	2024-12-20
Verifier	Ariadne Martinez
Institution	Department of Transport

Non Conformance Round 1 Edit

Explanation	Check again
Root Cause	
Corrective Action	
Action	

Status of the assessment: PRE_ASSESSMENT

IV. Address concerns raised by verifiers



Sector admin, technical admin, or MRV admin should click the 'verification' button in the side menu. The data collection assessments that have been sent to verification will appear with the information on non-conformities (NCs). They can be viewed by clicking the 'view' button.

Inventory for cambodia	Thu Sep 04 2025 05:24:29 GMT+0000 (Coordinated Universal Time) 1.A.3.b.iii - Heavy-duty trucks and buses ONE	2018	NC Recieved	Dec 20, 2024	View
------------------------	--------------------------------------------------------------------------------------------------------------	------	-------------	--------------	----------------------------------------------------------------------

f. Concern raised for activity data collected from a data-providing institution

If a concern is raised for activity data collected from a data-providing institution, the concern raised by the verifier can be viewed by selecting 'view concern'.

Parameter	Data Provider	Value	Unit		Action
Consumption	City Bus Authority	34000	(Mass)	Action View Concern Info ⋮	

In the given boxes, the ‘root cause’ for the raised concern can be added. If corrective action is taken for the identified cause, that can be mentioned in the given box and click complete. Then, the user needs to click on the ‘action’ button. This provides two options. One is to change the data by clicking on the ‘enter correct data’ or collect data again from a data-providing institution by clicking on the ‘assign data provider’. Once the required action is taken, the request must be sent to the data collection team by clicking ‘send to DC’ button. Once data is sent to the data collection (DC) team, it will be sent to QC and verification.

Non Confirmation Round: Round 1

Area: Consumption Date: 2024-12-20T05:26:02.000Z

Explanation: Check again

Root Cause

Activity data is not correct

Corrective Action

Sent to DC team

If a data request is generated by adding a new data providing institution, a new request will be sent to respective data providing institution through the data collection team and normal data collection process will be initiated.

Enter value for inventory scenario - Consumption ×

Enter correct data Assign data provider

Correct value

Enter value

Unit

Mass × ▾

SEND TO DC TEAM

Enter correct data Assign data provider

Institution

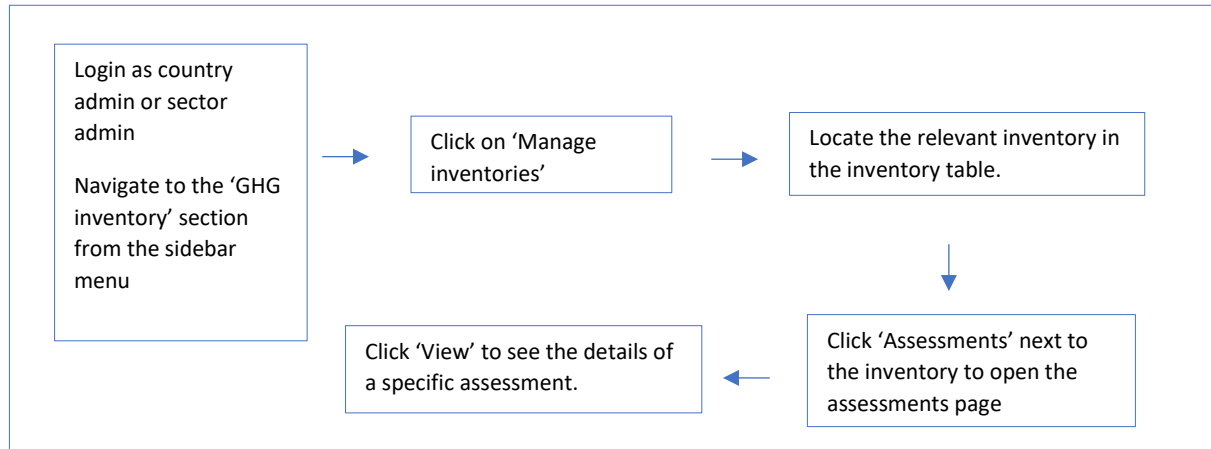
Select .. ▾

🔍

- Sri Lanka Railways
- Research Institute for Transport Science and Technology
- City Bus Authority
- General Department of Land Transport
- Traffic Department Services
- Transport Board

10.10 GHG inventory assessment list

The users can view all the data collection assessments for emission sources related to a specific inventory here. This includes detailed assessment information, assigned data providers, and any data that has been entered.



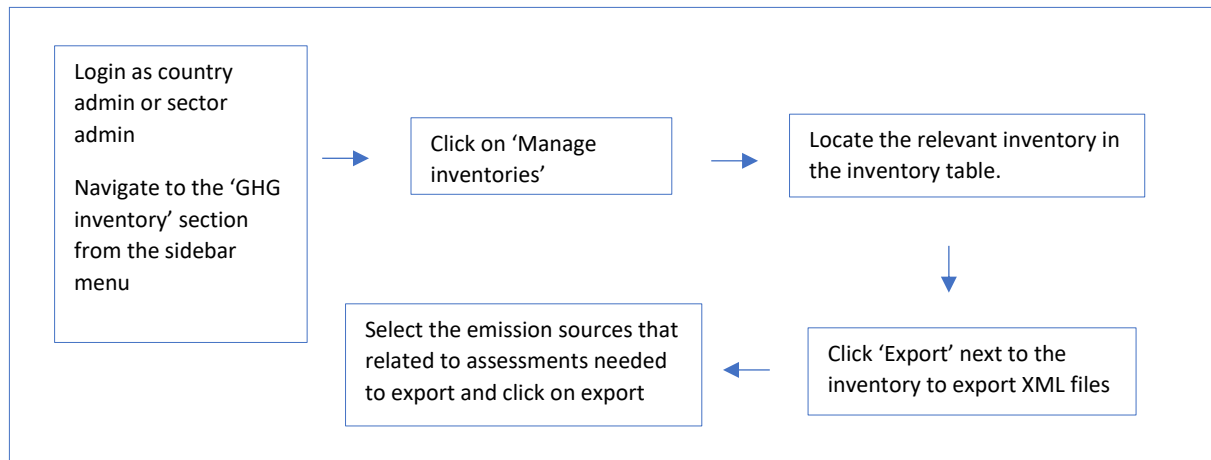
The user needs to navigate to the GHG inventory section and click ‘manage inventories’ in the sidebar. To access the assessments page for an inventory, the user needs to click the ‘assessments’ button next to the relevant inventory in the inventory table. This will direct the user to the assessments page for that inventory. On the assessments page, all the data collection assessments that have been completed for the selected inventory will be loaded and displayed.

Manage GHG inventory assessment						
ID	Date	Assessment		Emission source	Tier	Action
26	Sep 4, 2025	Thu Sep 04 2025 05:24:29 GMT+0000 (Coordinated Universal Time) 1.A.3.b.iii - Heavy-duty trucks and buses ONE		1.A.3.b.iii - Heavy-duty trucks and buses	One	

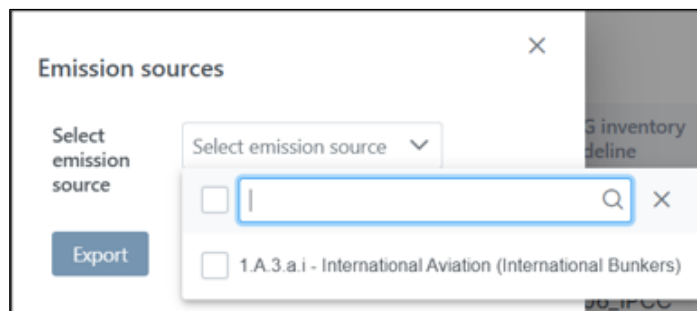
Showing 1 to 1 of 1 entries << < 1 > >> 10 ▾

Users can manage the assessments by clicking ‘view’ button to review the details of an assessment or the ‘delete’ button to remove it from the inventory.

10.11 Export XML files



To export XML files, the user needs to navigate to the GHG inventory section and click 'manage inventories' in the sidebar. The page will display the created inventories. The inventory for which the XML file is needed should first be located and then exported. In the popup, required emission sources should be selected from the dropdown menu. Only emission sources with verified assessments will be available for selection.



After selecting the emission sources, the XML file can be downloaded by clicking the export button. Exported XML files can be imported to IPCC software (v 2.96)

Note on Browser Pop-ups

When downloading files from the CAD tool, your browser may block the download if pop-ups are disabled. If the download does not start, please enable pop-ups for this site in your browser settings and try again.

Revision History

Revision No	Date	Amendment
First issue, v1	2024.12.30	
Second issue, v 1.1	2025.02.06	Updated after proofreading
Third issue, v 1.2	2025.09.09	Updated with new IPCC category codes (Screen shots) Updates the change on climate action page Added note on browser popups