



Data collection tool: Sectoral Activity data for GHG Emissions (S.A.G.E.)

User Manual

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Contents

Contents	2
1. Background and Purpose	5
What SAGE does	5
Sectors Covered	6
Key features	6
Intended Users	6
2. Getting started	7
Accessing SAGE	7
Welcome to SAGE	7
Getting to know SAGE	7
SAGE Categories	7
3. SAGE Summary (Cheat) Sheets	9
3.1 Activity Data (AD) Collections (see section 5 page 15 for details)	9
3.2 Data Gaps (see section 10 page 118 for details)	10
3.3 Analytic (see section 11 page 125 for details)	11
4. Navigating between SAGE components	13
5. Activity Data (AD) Collections – Generic for all sectors	15
5.1 Overview	15
5.1.1 The overall ‘AD Collections’ process	15
5.1.2 How to navigate the AD Collection	16
5.1.3 Dashboard	16
5.1.4 Explore	17
5.1.5 Top-of-Page Tabs	18
5.2 AD Collection Creation/Management Process	19
5.2.1 Background	19
5.2.2 View available AD Collections	19
5.2.3 Add new AD Collection	20
5.2.4 Edit existing AD Collection	21
5.2.5 Delete existing AD Collection	21
5.2.6 How to add a new data record – import from Excel	21
5.3 AD Collection Export Process	22
5.4 ‘AD collection’ Signoff Process (draft, review, approve, publish)	23
5.4.1 Signoff Process Overview	23
5.4.2 Draft (enter AD collection)	24
5.4.3 Move to Review	24
5.4.4 Review	24
5.4.5 Approve	24
5.4.6 Publish	25
6. Activity Data (AD) Collections – Energy	26
6.1 AD Collections Data Entry Process	26
6.1.1 Background	26
6.1.2 How to edit activity data records	27
6.1.3 How to add a new data record – manual entry	28
6.1.5 How to calculate energy consumption of fuels in TJ	34

6.1.6 Estimating activity data using the top-down (“Reference”) approach.....	35
6.1.7 Specific for ‘Stationary Combustion’ (St. Combustion)	41
6.1.8 Specific for ‘Transport’	42
6.1.9 Specific for ‘Fugitive Emissions’	44
7. Activity Data (AD) Collections - IPPU	47
7.1 AD Collections Data Entry Process.....	47
7.1.1 Background	47
7.1.2 How to edit activity data records.....	47
7.1.3 How to add a new data record – manual entry.....	48
7.1.4 How to add or edit gas Bank record	50
8. Activity Data (AD) Collections - Agriculture.....	52
8.1 AD Collections Data Entry Process.....	52
8.1.1 Background	52
8.1.2 How to start adding a new data record – common steps for all categories.....	55
8.1.3 How to add new activity data records – common to all agriculture categories.....	56
8.2 Category-specific data entries	58
8.2.1 Category group 3.A	58
8.2.2 Category group 3.C	61
9. Activity Data (AD) Collections - Waste	108
9.1 AD Collections Data Entry Process.....	108
9.1.1 Background	108
9.1.2 How to edit activity data records.....	109
9.1.3 How to add a new data record – manual entry.....	109
10. Time series Data gaps	119
10.1 Background	119
10.2 How to fill data gaps in a time series	120
Gap filling option 1: Aggregate	123
Gap filling option 2: Interpolate / Extrapolate.....	124
Gap filling option 3: Surrogate.....	124
Gap filling option 4: Average value.....	125
Gap filing option 5: First value	126
11. Activity data analysis	126
11.1 How to calculate total fuel consumption	127
11.2 How to display historical trends	128
11.3 How to ‘Rank by Category’ (for the Energy sector only)	129
11.4 How to ‘Rank by Fuel’ (for the Energy sector only)	131
11.5 How to analyze Activity Data Changes	132
11.6 How to ‘Performance Indicator’	134
12. Country-specific menu options and background data tables.....	135
12.1 Background	135
12.2 How to manage Configuration tables	136
12.2.1 Edit or delete activity a data record	138
12.2.2 Add a new activity data record	138
12.2.3 Hide configuration table selections that are irrelevant to your country.....	140
12.2.4 Configuration layer organization for the agriculture sector.....	142
12.2.4.1 Addressing different frequencies of updates for the agriculture sector parameters ..	142

12.2.4.2 Separating entries for quantitative and qualitative parameters	143
12.2.4.3 Configuration table and parameter entries	146
12.2.4.4 Configuration parameters that are required for category group 3.A	147
13. System administration	153
13.1 How to close/open the site for maintenance	153
13.2 How to manage users	154
13.2.1 Add new user	154
13.2.2 Edit new details	155
13.2.3 Delete a user record	155
13.2.4 Temporarily disable user access	156
13.3 How to manage user groups	156
13.3.1 Add new user group	157
13.3.2 Edit a user group	158
13.3.3 Delete a user group	158
13.4 Other administration menus	159
Appendix A: Acronyms	160
Appendix B: Examples of common data entry field values	162
Appendix C: Data Dictionary	166
Appendix D: Mapping import information and data structure – Energy Sector	168
Appendix E: Mapping import information and data structure – IPPU Sector	169
Appendix F: Mapping import information and data structure – Waste Sector	170
Appendix G: Example of Data Categories presentation in SAGE (the energy sector)	171
Appendix H: Fuels	172
Appendix I: Fuel Categories	173
Appendix J: Export from SAGE	174

1. Background and Purpose

What SAGE does

Sectoral Activity data for Greenhouse gas Emissions (**SAGE**) is a greenhouse gas (GHG) 'activity data (AD) collection' data collection tool to support national climate measurement, reporting, and verification (MRV) systems, especially in developing countries, through robust data collection, intelligent processing, and storage. SAGE is fully compatible with the UNFCCC reporting guidelines for non-Annex I parties, and with the 2006 IPCC guidelines for national greenhouse gas (GHG) AD collections. SAGE was developed to support governments collecting activity data to ultimately meet the reporting requirements under the Enhanced Transparency Framework of the Paris Agreement.

SAGE provides an intuitive and user-friendly interface for collecting data, and critical documentation to achieve transparent, accurate, consistent, comparable, and complete (TACCC) GHG AD collections. The outputs from the tool can also be used as the basis for calculating projections, and mitigation impact quantification. In the simplest terms, SAGE is a dedicated data management system with the GHG AD collection database and enabled business intelligence. It allows for inputting data collected from multiple sources, and processes it for export to GHG AD collection estimation spreadsheets or software that quantifies GHG emissions and removals. At the outset, it functions as a reliable repository for documenting, storing, processing, conducting quality control, querying GHGI activity data, and performing analytics on the available data sets.

SAGE can be run on a stand-alone computer or through the cloud using version synchronization, so that it can support multiple data collectors anytime, anywhere. Its administrative interface provides security and flexibility of views for different groups of users. Its database is robust and designed for speed and scalability.

Sectors Covered

The current version of SAGE covers the following sectors:

Energy

Industrial processes and product use (IPPU) (with extended functionality)

Waste

Key features

The key features of this version include:

- Record and store activity data (as described in the 2006 IPCC Guidelines) and parameters intrinsic to the fuel properties (e.g., fuel density or net calorific value) as a time series or on an ad-hoc basis.
- Collate activity data, keep track of data origins and uncertainties
- Automatic Conversions to the units as required in the 2006 IPCC equations for stationary combustion categories
- Category classification mapping between the IPCC and UNFCCC categories to provide flexibility of category reporting for developing countries under the UNFCCC and the ETF under the Paris Agreement
- Modular sectoral dashboard structure that allows a seamless shift between sectoral sections of the application
- Business intelligence to resolve data gap issues
- Business logic to enable default uncertainty estimates in-line with the 2006 IPCC Guidelines
- Enable Excel input/output for all configuration tables, and produce CSV files compatible with emission calculating tools (e.g., IPCC emissions calculating software tool)
- Data analytics
- Data repository
- Administrative interface for user access control and user management
- User guidance manual

Intended Users

SAGE has been designed to support developing countries working on data collection and climate change policy within national climate change teams, government statistical offices, industry associations, corporations and local government agencies. Through the use of this tool, users will increase efficacy, efficiency, and sustainability of their activity data collection and employ nationally-approved activity data for robust policy analyses.

2. Getting started

This section will guide you through the initial steps to run the SAGE software.

Accessing SAGE





Due to data security requirements, SAGE will be installed on the server according to the guidance of your country's National Inventory Compiler or the Inventory Focal Point. Please ask your country's Inventory agency for the specific link to the software. They will set up your user account and send you the details.

Welcome to SAGE

Once you have received authentication details and the access link, you can start working with SAGE. First, access SAGE's welcome page (figure 1) and, if it is your first time with SAGE, take a couple of minutes to view a video tour of the application to familiarize yourself with its key features.

Getting to know SAGE

Users without administration rights can safely explore the tool but don't click any of the following icons:

	pencil (modify)
	cross (delete)
	Add
	Save
	Delete

If you think you're about to accidentally change data then click "Cancel" or "Clear".

SAGE Categories

SAGE (March 2023) currently covers:

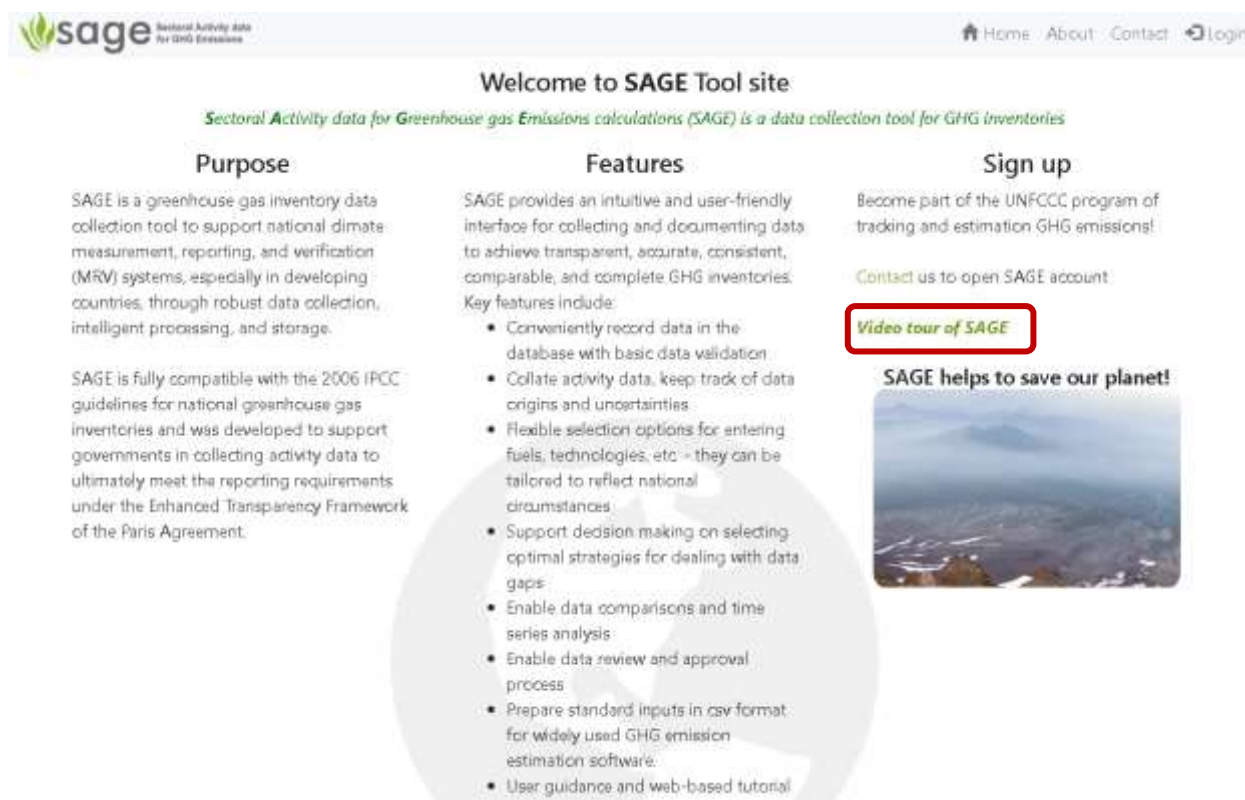
Energy: Fuel Combustion (including stationary combustion and transport), and Fugitive Emissions

IPPU: mineral industry, chemical industry, metal production, non-energy use of fuels, electric and electronic industries, ozone depleting compounds, and other industries.

Waste: solid waste disposal, biological treatment of solid waste, waste Incineration, wastewater treatment and discharge, other

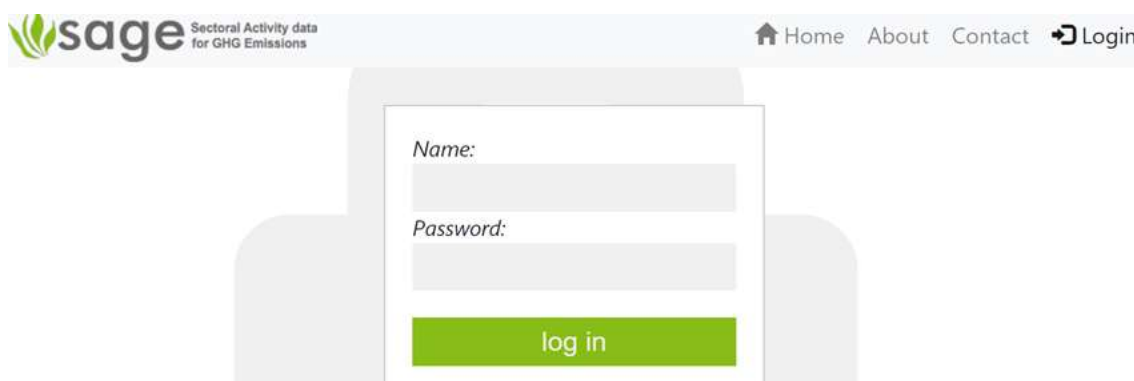
Section 5 mentions categories and Appendix D lists them all. More categories may be developed and added in future (for example, user-defined categories).

Figure 1. SAGE's welcome page <http://sage.is2000.co.nz/app/welcome>



Now you are ready to use your user code and login to enter the tool. Click the Login button (**Figure 1**). SAGE's authentication screen will open (**Figure 2**). Enter your credentials.

Figure 2. SAGE's authentication screen



If you leave SAGE inactive for too long then you will automatically be logged out for security.

3. SAGE Summary (Cheat) Sheets

You should read the whole manual before using the tool. You've got to page 9 so you're doing better than most people. These three summary sheets give an initial overview of SAGE, are a quick reference summary which may help as a refresher if you haven't used SAGE for a while, and may also be a useful starter (if you're not going to read the rest of the manual until you get stuck). Appendix A: Acronyms on page 160 lists the acronyms used in this document.

0.1 Activity Data (AD) Collections (see section 5 page 15 for details)

'AD collection' includes an annual activity data for the GHG Inventory that can be used for GHG emission calculations, policy analysis, NDC tracking, or building projections. Each AD collection includes the activity data for all categories included in the energy, IPPU, or waste sector with supporting information for the inventory year. To enable time-series analyses and reporting, all AD collections for the same time-series should have the same name and extension showing the AD collection year, for example, AD_name-2000, AD_name-2001, and so on.

The 'AD Collections' page lets you create, view, and manage GHG AD collections, insert, edit and delete AD data, review and approve the AD by making them available for data analysis. The AD collection management process includes data entry, drafting, review, approval and publishing.

At each stage, you can list, add, view history, export, import, review change log and get info.

To 'manage' an AD collection, click 'Manage all' on the left and select the AD collection to work with.

AD Collection state:	Draft	AD collection is created and available for data entries
	Review	data entry is complete and AD collection is sent for technical review
	Approve	technical review is complete and the AD collection is sent for final sign-off
	Published	AD collection is successfully signed-off by an authorized person. At this stage, the AD collection is locked. AD collection is now available for data analyses and publication.
AD Collection status:	enabled	open for data entry and editing
	disabled	contents can be viewed, but not edited
	deleted	AD collection is archived and no longer can be viewed or edited.

Key points:

- An AD collection can consist of one or more annual entries arranged by IPCC categories.
- The name of an Annual AD Collection starts with the name of the relevant time-series collection followed by the year the annual collection, e.g., "ADC_2000-2010_2000" means that the collection named "ADC" belongs to the series "ADC_2000-2010" and covers the year 2000.
- Every time you open the AD collection for change or update, you must include the reason for change (for example, error fix) and a detailed message on the change (for example, who made the change and when with a specific note on the change).
- SAGE guides you through the data to input, including management of mandatory fields.
- SAGE has many features for converting between different units (energy, mass, distance, etc.).

Figure 3. Editing AD Collections



id	ipcc	ext	tier	submitted	Time-series AD collection	code	state	year	aggreg.	value	val. units	val.type
813	1.A		1	2021-05-24	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2002	draft	2002	National	11279.26	TJ	NA
892	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2005	draft	2005	National	100.86	TJ	NA
947	1.A		1	2021-05-28	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2009	draft	2009	National	53757.66	TJ	NA
829	1.A		1	2021-05-24	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2004	draft	2004	National	8394.16	TJ	NA
882	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2003	draft	2003	National	1.00	TJ	NA
873	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2002	draft	2002	National	8.00	TJ	NA
904	1.A		1	2021-05-24	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2000	draft	2000	National	0.83	TJ	NA

See **Figure 7** on page 15 to see the summarized process for managing AD collections in SAGE.

0.2 Data Gaps (see section 10 page 119 for details)

‘Data Gaps’ reveals data gaps in the existing AD collections,
guides users through options to fill data gaps appropriately (per UNFCCC requirements)
performs time series analysis

The Data Gaps **Dashboard (Figure 118)** overview indicates when each method should be used.

Click ‘Switch to’ at the top, then ‘Data Gaps’ to get to this component.

To find the gaps in the time series,

Click ‘Find’ (on the left)

Choose *data categories*, then use the available category-specific filters if available (e.g., fuel, product, process, etc.) to narrow down your search, or use “all” option.

Select AD collection

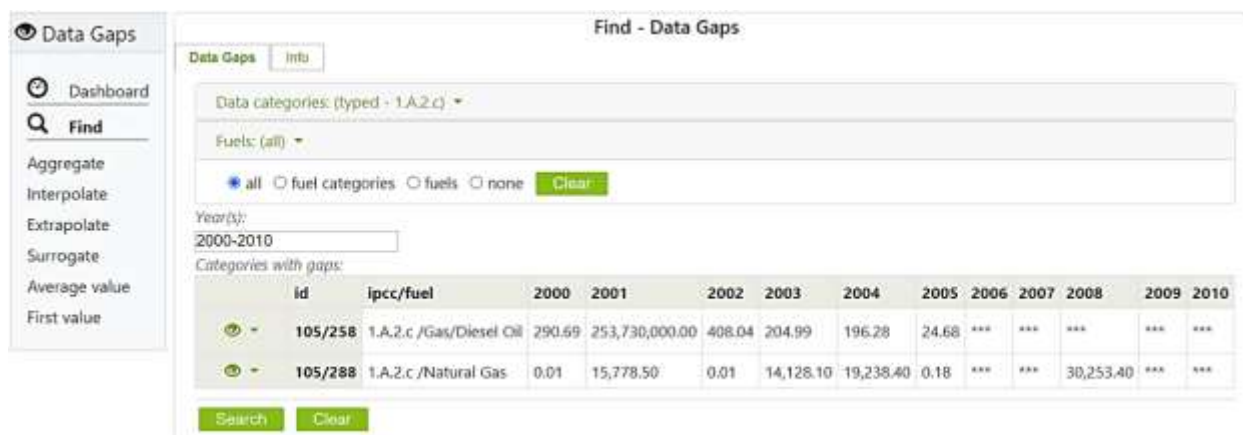
Select year(s) (if entering more than one year then use a comma or hyphen between years)

To fill data gaps, use SAGE to try any of the following methods:

- Interpolate** to fill in internal data gaps for up to 3 points using linear regression,
- Extrapolate** to estimate missing data points in the beginning and in the end of the time series using linear regression,
- Surrogate method** filling gaps using statistical methods,
- Average value** fill gaps using simple averages,
- First value** fill gaps using the first value,

SAGE includes explanatory information for each method and provides guiding messaging and relevant dialog boxes to help navigate different gap filling techniques.

Figure 4. Finding Data Gaps



	id	ipcc/fuel	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	105/258	1.A.2.c /Gas/Diesel Oil	290.69	253,730,000.00	408.04	204.99	196.28	24.68	***	***	***	***	***
	105/288	1.A.2.c /Natural Gas	0.01	15,778.50	0.01	14,128.10	19,238.40	0.18	***	***	30,253.40	***	***

Click the eye button at the beginning of each time series with data gaps to select the preferred method to fill the gaps from the available list.

0.3 Analytic (see section 11 page 126 for details)

Users with 'Reader' access rights can use the 'Analytic' function on published data.

All other users can use the 'Analytic' function to analyze data and check data quality during the AD collection production (before it's published).

Click 'Switch to' at the top, then 'Analytic' to get to this component or use the global link "Analytic" on the top of the screen.

Analytic options are:

Total values: Select a category or categories and a year

Shows total energy consumed as a result of combusting selected fuels in selected years

Historical trends: Select a category or categories, fuel(s), and year(s)

Shows time series analysis for fuel consumption for the combination you selected

Rank by category: Select an Activity Data (AD) collection and a year

This shows the energy in TJ used ranked by IPCC category for your chosen parameters. Please note that this option is applicable to the Energy sector only.

Rank by fuel: Select an AD collection and a year

This shows the energy in TJ used ranked by fuel for your chosen parameters. Please note that this option is also applicable to the Energy sector only.

AD Change: Select an AD collection, select whether you want sub-categories summed, and a year or years

If entering years, separate each with a comma (',')

This shows year(s) as columns, IPCC categories as rows and the energy in TJ or an industry activity data (e.g., a mass of a product) as values

If you select more than one year then this allows you to compare differences (shown 'Δ')

Performance Indicator: Select data category or categories, a fuel or fuels (or other available category-specific parameters), an AD collection, whether you want sub-categories

summed, and a year or years (use a hyphen between a pair of years if you want to show a range), comparative data, comparative data name and comparative data units. This shows a time series table of consumption (summed if required), by category, fuel, AD collection, and by year(s).

Analytic
Dashboard
Total values
Historical trend
Rank by Category
Rank by Fuel
AD Change
Performance Indicator

Total values - 1.A

1.A1.B.1.a Coal1.B.2.a Oil1.B.2.b GasInfo

Data categories: (all)

Time-series AD collection
Fuels: (all)

AD inventory:
Test_2000-2010

Year:
2000

Consumption:
Fuels: All

year	ipcc	category	total (TJ)
2000	1.A.1.a	Main Activity Electricity and Heat Production	9,686.7600
2000	1.A.1.b	Petroleum Refining	12,366.0000
2000	1.A.1.c	Manufacture of Solid Fuels and Other Energy Industries	19,590.9000
2000	1.A.2.c	Chemicals	16,242.7000
2000	1.A.2.e	Food Processing, Beverages and Tobacco	8,374.5400
2000	1.A.4.a	Commercial/Institutional	4,442.3500
2000	1.A.4.b	Residential	3,491.8800
Total			74,195.1300

4. Navigating between SAGE components

Once you are logged in, SAGE's **Quick links** page will be displayed (**Figure 5**). This page displays the functional components of the tool (AD Collections, Analytic, and Data Gaps) and allows you to navigate between these components. This page is available to all users, but available links will depend on the specific group permissions set by your system administrator.

Across the top of the screen, there is a global navigation pane with menus (Figure 3 shows them in the red box) – **Switch to**, **Analytic**, **Data Gaps**, **AD Collections**, and **Configuration**

Figure 5. SAGE's quick links page

The top menu row is visible in all screens of SAGE (regardless of the component you are using):



To change the sector you are working on, click the ► button to show the menu below, and then click on the relevant sector (1. Energy, 2. IPPU, or 4. Waste).

153

135

15

126

119

Welcome to SAGE

Sectors

- 1. Energy
- 2. IPPU
- 4. Waste

Open

- Administration
- Configuration - Basic
- Configuration - Energy sector
- AD Collections
- Analytic
- Data Gaps

Administration section 13 page

Configuration section 12 page

AD collections section 5 page

Analytic section 11 page

Data gaps section 10 page

Click any menu (along the top row) to see the list of modules available in that component of SAGE.

Click any component to go to that component.

The components shown will depend on which sector you currently have selected.

E.g., if you are in the Energy sector then Energy sector configuration and Energy sector AD collections will be available but other sector configuration and other sector AD collections will not be available.

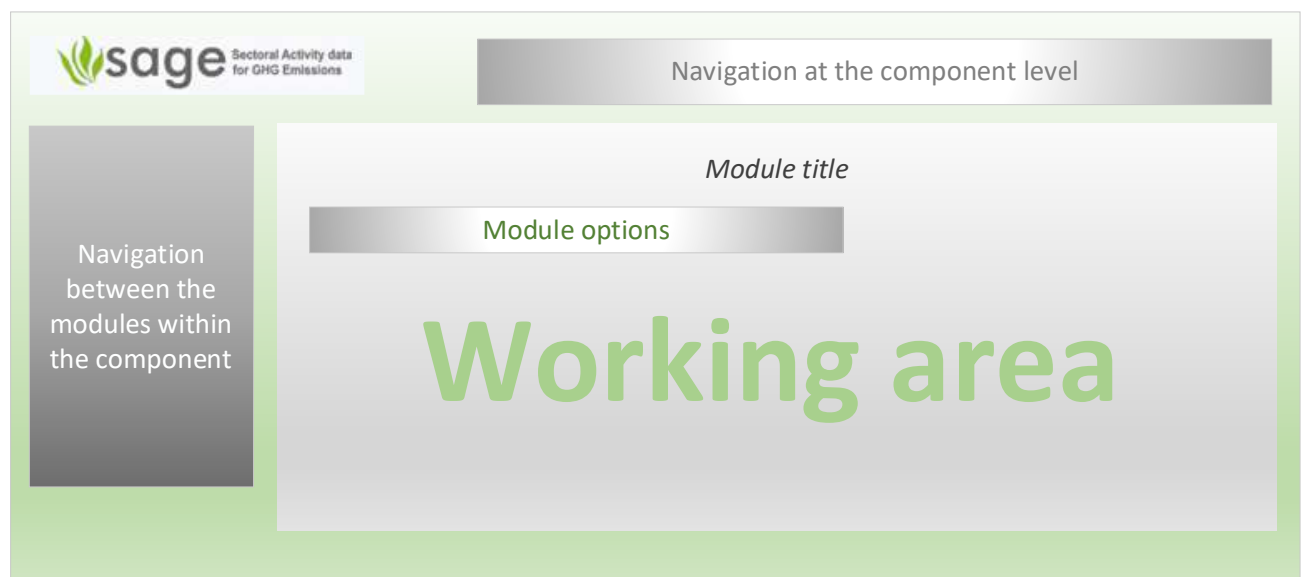
To open the list of links, click the menu:

- Switch to** allows to quickly switch between key components of SAGE (AD Collections, Analytic, and Data Gaps). Depending on your requirements, there may also be Administration and/or Configuration components.
- Analytic** opens the list of links to the available data analysis modules
- Data Gaps** opens the menu of links for filling in data gaps in the fuel consumption time series
- AD Collections** opens the list of links to Activity Data Collections management and drafting
- Configuration** enables you to customize the default selection options for the currently selected sector (Energy or IPPU) to reflect your country's national circumstances

The big green buttons in the middle of the screen are also quick links to relevant SAGE modules, however, unlike the top screen navigation menus, they are available only in the **Quick links** page. When you click any quick link, SAGE will open the relevant component window. The windows for all functional components in SAGE are organized in the same way (**Figure 6**):

- the global navigation pane across the top for switching between different SAGE components is located across the top,
- the local navigation pane to switch between different modules within the component is located on the left side of the screen,
- the working area for the current module that includes the module control options (presented in a form of tabs), forms, tables and results specific for each module. These are different for different components and modules.

Figure 6. Functional interface organization



5. Activity Data (AD) Collections – Generic for all sectors

5.1 Overview

5.1.1 The overall 'AD Collections' process

Sets of data are put into 'AD Collections'.

There may be any number of 'AD Collections' for any particular time period – there may be zero, one or many AD Collections for a period.

Each AD Collection must first be created before data can be put into the AD Collection.

Once data is in an AD Collection, you can optionally try to fill data gaps.

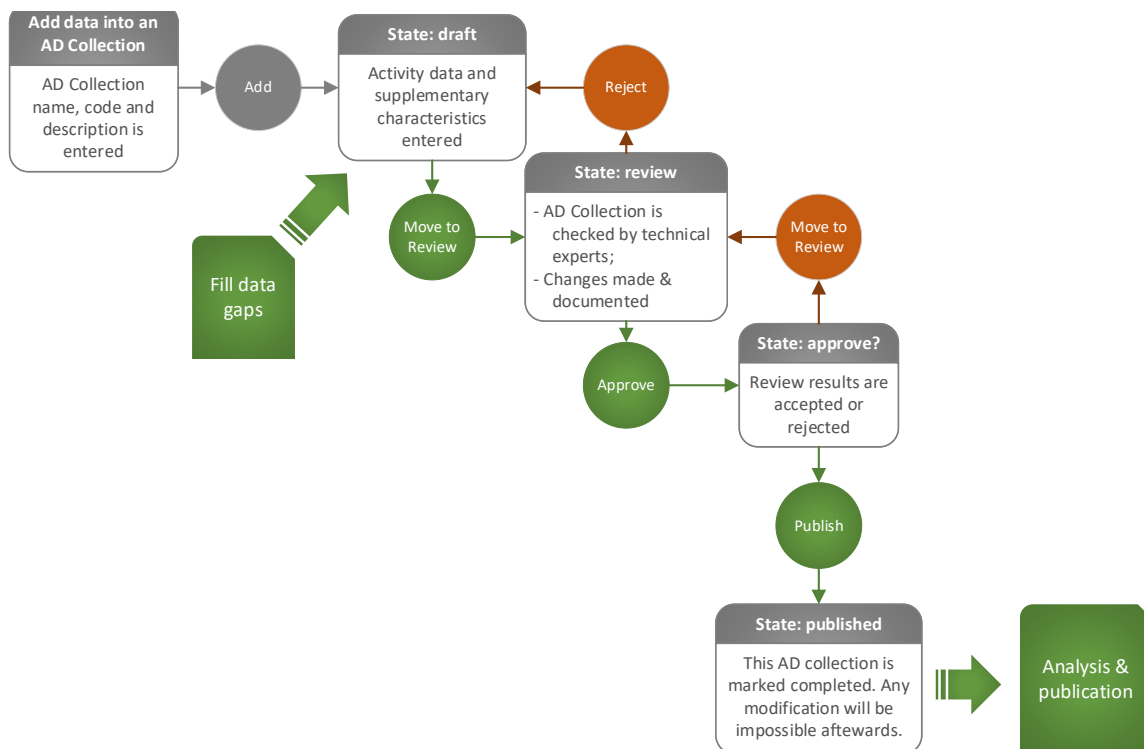
Once satisfied with data state in an AD collection, the AD Collection can be processed through a signoff process; draft ready for review, reviewed and ready for approval, approve and ready for publishing.

To put data into a draft 'AD collection',
 data is entered,
 data gaps are optionally filled,
 the AD collection is reviewed, may be approved or rejected,
 approved AD collection is either published or rejected,
 'published' AD collection can be analyzed and put into publications

Filling data gaps can require quite different skills from the rest of the AD collection process so it has been logically separated in SAGE (and in this manual).

Figure 7 summarizes processing and management of AD collections in SAGE.

Figure 7. AD Collection pathway through the SAGE system



5.1.2 How to navigate the AD Collection

Click the **AD Collection** quick link (or use the top navigation menu panel) to open the AD Collection component.

SAGE uses the term annual activity data (AD) collection for the GHG AD collection emissions calculation. Each AD collection includes the activity data for all categories and fuels with supporting information for one AD collection year. To enable time-series analyses and reporting, all AD collections for the same time-series should have the same name and extension showing the AD collection year, for example, AD_name-2000, AD_name-2001, and so on.

The AD Collection page lets you create, view, and manage GHG AD collections, insert, edit and delete AD collection data, review and approve the AD Collection data by making them available for data analysis.

5.1.3 Dashboard

Dashboard shows Information, History and Changes:

Info:

Annual Activity Data (AD) Collections

SAGE uses the term annual AD collection to describe an annual activity data collection for the GHG inventory emissions calculation. Each annual AD collection includes the activity data for all categories and fuels with supporting information for one inventory year. To enable time-series analyses and reporting, all inventories for the same time-series should have the same name and extension showing the AD collection year, for example, **AD collection name-2000**, **AD collection name_name-2001**, and so on.

The AD collection page enables you to create, view, and manage GHG activity data collections, insert, edit and delete data, review and approve the AD collection data by making them available for data analysis. The following groups of options are available here:

- **Explore** - to view all available annual AD collections and records
- **Manage** - to create and manage annual AD collections
- **Edit annual AD** - to view, create and manage records within annual AD collections
- **Draft** - to view and export editable annual AD collections (drafts)
- **Review** - to signify that the data entry is complete and request a technical review of the collection's data
- **Approve** - to accept/reject the results of the collection's data review and request approval for annual AD collections data publication
- **Publish** - to approve annual AD collections data for viewing and analysis by all intended users

History:

Editions history

<< < > >> show 10 records, starting from # 1 (total 153) Search Clear

id	AD inventory	survey	code	year	date	num of records	state	status	edited by	edition reason	details
77	My AD 1990-2020	My AD	My AD_2018	2018	2021-05-14 22:26:33	0	draft	enabled	Admin (UNFCCC Data Collection Agency)	first draft	National AD 1990-2020, latest reporting year, created 14 May 2021
76	My AD 1990-2020	My AD	My AD_2019	2019	2021-05-14 22:26:22	0	draft	enabled	Admin (UNFCCC Data Collection Agency)	first draft	National AD 1990-2020, latest reporting year, created 14 May 2021

Changes:

Changes log

<< < > >> show 10 records, starting from # 1 (total 949) Search Clear

id ↓	date	action	user name	details
8860	2021-05-14 22:32:54	dctsur_op_ad_1a1_delete_record	Admin	rec_id=810
8859	2021-05-14 22:31:52	dctsur_op_ad_1a1_new_record	Admin	rec_id=100000000; name=100000000
8858	2021-05-14 22:26:33	dctsur_op_manage_new_record	Admin	rec_id=100000000; name=My Ad
8850	2021-05-14 17:57:10	dctsur_op_publish_export	Admin	sage_export_publ_ad.zip download processed

5.1.4 Explore

The 'Explore' menu on the left shows 4 options:

Time-series AD collection

This shows all AD collections for the entire time series, years they cover, status, etc. as below.

Explore Time-series AD collection

show 30 records, starting from # 1 (total 12) Search Clear

Time-series AD collection ↓	years range	state	Annual AD	records	categories
Uncertainty_2000-2005	2000-2005	draft	6	166	5
Test_2000-2010	2000-2010	draft	11	151	8
RA_National_2000-2010	2002-2010	draft	9	27	1

Annual AD Collection

This shows the activity data across all categories for one year, their codes, states, etc. as below.

Explore Annual AD collection

> >> show 30 records, starting from # 1 (total 77) Search Clear

Time-series AD collection ↓	code	year	state	approach	records	categories
AB_AD_2011-2020	2011-AB_AD_v1	2011	draft	sectoral	6	4
AB_AD_2011-2020	2012-AB_AD_v1	2012	draft	sectoral	6	4

Annual AD

This shows the activity data within each of the AD collections, including information as below.

Explore Annual AD collection data

show 30 records, starting from # 1 (total 985) Search Clear



id ↓	submitted	Time-series AD collection	code	state	year	ipcc	tier	aggreg.	val.type	value	units
979	2021-08-26	My AD_1990-2020	My AD_2020	draft	2020	1.A.3.a.ii	3	Airport	NA	500037.93	TJ
977	2021-05-28	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2010	draft	2010	1.A	1	National	NA	506.42	TJ

Info

The info tab shows information about how to use the 'Explore' functions.

5.1.5 Top-of-Page Tabs

Each module in the **AD Collections** component includes the following control tabs:

- | | |
|----------------|--|
| List | displays a table with the list of records; each record has a “ pencil ” icon  at the beginning (this is the edit option). The list of the individual records for each category also has a “ cross ” icon  at the end (to delete a record), |
| Add | allows new item creation (an AD collection, an AD collection record, or a record in a configuration table), |
| Export | <p>this is only available when either</p> <ol style="list-style-type: none"> 1. a particular AD collection and a category are selected; in this case you can export the data in a .csv file 2. The Draft section allows to export the entire collection if the all of data entries in that collection are flagged as “ready” (in which case, a pencil icon appears at the beginning of the relevant collection record). 3. in the ‘Publish’ section; one can export the whole AD collection of SAGE as a .csv file or as a file ready for IPCC import |
| Import | (in the current version of SAGE) importing is available by category when ‘Edit annual AD’ is selected |
| Changes | contains a log of changes performed over the records within the module, |
| Info | provides user guidance for each option in the module. |

5.2 AD Collection Creation/Management Process

5.2.1 Background

The 'Create AD Collection process is a subset of the 'AD Collections' process (see 5.1.1 *The overall 'AD Collections' process* on page 15).

Every time you open the AD collection for change or update, you must include the reason for change (for example, error fix) and a detailed message on the change (for example, who made the change and when with a specific note on the change).

5.2.2 View available AD Collections

To view all available AD collections, select the AD collection component, then click **Manage all** link in the local navigation pane. The list of all available AD collections will be displayed (**Figure 8**):

Figure 8. Manage AD collections option in the local navigation pane



The screenshot shows the Sage Sectoral Activity data for GHG Emissions interface. In the local navigation pane on the left, the 'Manage all (77)' link is highlighted with a red box. The main content area displays a table titled 'Manage all (77) - List'.

id	Time-series AD collection	year	approach	description	rec.	begin date	closing date	state	status
100	GAPS_TEST_RA_National_2000-2010	2010	reference	RA at the national level	7	2021-01-23	2022-03-28	draft	enabled

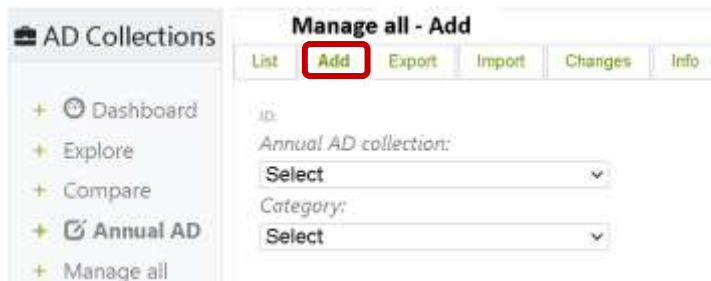
You can also check the **state** and **status** of each AD collection in this page.

5.2.3 Add new AD Collection

To add a new AD Collection:


1. Click the "Add" tab (Figure 9).

Figure 9. Use tab "Add" to add a new AD Collection



2. Use the provided 'new AD collection' form to create a new AD collection
All fields in this form are mandatory (Figure 10).

Figure 10. The 'new AD collection' form

	<p>Name: AD collection name include the name and reporting year</p> <p>Code: include a unique, user-defined code Please use <INV>_<year>_<version>_<date created YYYY MM DD> an example for AD collection reported up to 2017, version 1, created 19 Jan 2021: AD_2017_v1_20210119</p> <p>Add multiple: Tick this if you want to add multiple years in the range</p> <p>Year(s): the year(s) of coverage the year(s) this AD collection covers</p> <p>Name: a unique, user-defined code Waste_<#>_<year(s)>_v<version>_<date created yyyy mm dd> E.g., for AD collection reported up to 2022, version 3, created 28 Mar 2023: <Waste>_2022_v3_20230328</p> <p>Description: the AD collection description this allows users to make notes and comments regarding the AD collection</p> <p>Timeframe for data entry: in many countries, the data may be entered only within the agreed period or by the agreed date. Enter start and finish dates to specify the time frame when the AD collection is open for editing here.</p> <p>Status: When a new AD collection is created, it is automatically assigned draft state. The state will change as the AD collection goes through review and approval processes. The status determines whether the record is enabled or currently disabled for data entry.</p> <p>Edition details: the compiler can make any additional comments and provide further details</p> <p>Reason for change: If the compiler wants to document a change in the AD collection or the AD collection is to be moved through the review and approval process then record it here.</p>
--	---

- A time-series AD collection can consist of several annual entries.
- Each year of the time-series AD collection will have the same AD collection name that shows all years covered by that AD collection followed by a year covered by this AD collection instance, which should be reflected in the AD collection title, for example, "AD_2000-2010_2000".

5.2.4 Edit existing AD Collection

To edit existing AD collection names and details:

1. Click the "List" tab. You will see the existing table with records. Each record has a "pencil" button on the left for editing,
2. To modify the existing entry - click the "pencil" button before the record, then make your modification using the form provided, and
3. Click "Save" to save the updated record.

5.2.5 Delete existing AD Collection

To delete an existing AD collection record:

1. Click the "List" tab. You will see the existing table with records.
2. Click the "cross" at the right-hand end of the record to delete.

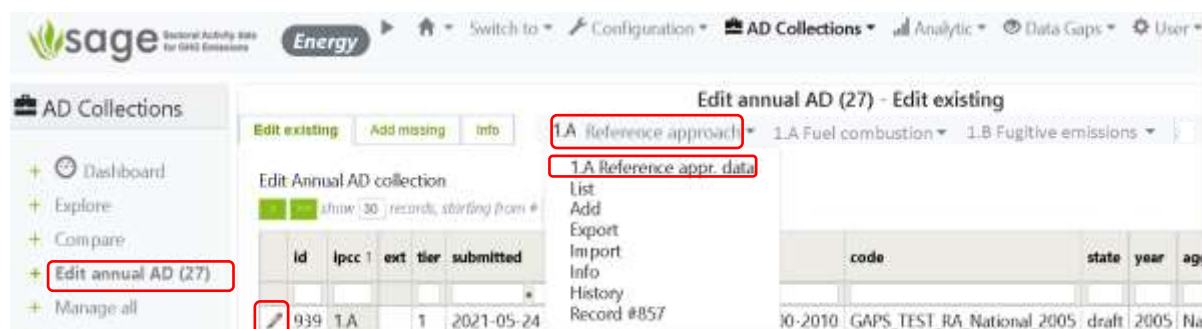
5.2.6 How to add a new data record – import from Excel

Users can import data from Excel into SAGE for all categories and fuels (*Figure 11*).

Note: *Appendix B* and *Appendix C* contain a Data Dictionary and other information related to import data.

1. **Create the file with data, ready to be imported.**
 - a. **One way to do that is:**
Click 'AD collection', 'Edit annual AD', click the AD collection, click the category

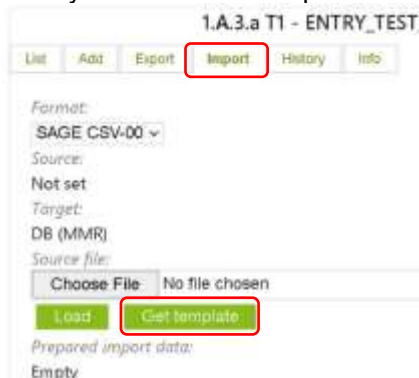
Figure 11. Import data



Click tab at top 'Import'



The system shows the import form



Follow the instructions in the template file.

b. An alternative way is:

export a similar set of data from a similar AD collection
open that exported file (e.g., in Excel)

Delete the first 2 columns (showing 'ID' and 'AD collection ID')

Delete the first 3 rows (delete all blank rows but keep the 'header' column name row)

Change the data as appropriate

2. Click 'AD collection', click 'Edit annual AD', click the AD collection to edit, click the category to import

3. Click 'import' (*Figure 12*)

Figure 12. Import AD data



id	submitted	ipcc	tier	aggreg.	type	coal amount	total (kt)	waste (kt)	mine depth	uncert.	basin name	state
8	2021-04-28	1.B.1.a.i	T1	National	1	1637.43 kt	1637.43	0		5 %		draft
14	2021-05-04	1.B.1.a.ii	T1	National	1	85424.2 kt	85424.2	0		5 %		draft

4. Choose the import format, choose the file to import and click 'Load'

5.3 AD Collection Export Process

Once an AD collection is published, you may want to export data.

To export data:

- Use the Export tab to export any published AD collection in a form of SAGE CSV file or in the IPCC time-series template
- choose option "single file" to export all categories in a single file (suitable for analytical or data presentation and reporting purposes)
- choose option "multiple files" to export each category in a separate CSV file (suitable for subsequent data entries)

If you want to import SAGE data into IPCC software then you will need to save the CSV file as Microsoft Excel 97-2003 Worksheet.

5.4 'AD collection' Signoff Process (draft, review, approve, publish)

5.4.1 Signoff Process Overview

The 'AD collection' signoff process is a subset of the 'AD Collections' process (see 5.1.1 *The overall 'AD Collections' process* on page 15).

Click the **AD Collections** quick link (or use the top navigation menu panel) to open the AD collection

The following modules are available here:

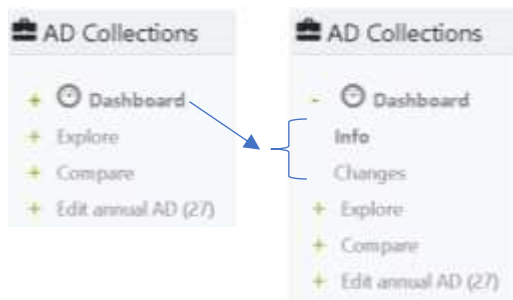
- Manage** to create and manage AD collections
- Draft** to enter/update data
- Review** to signify that the data entry is complete and request a technical review of the AD collection data
- Approve** to accept/reject the results of the AD collection data review and request approval for AD collection data publication
- Publish** to approve AD collection data for viewing and analysis by all intended users

That relates to the four **states** of AD collections that show their progress in the approval process:

- Draft** the AD collection is created and available for data entries
- Reviewed** data entry is complete and the AD collection is sent for technical review
- Approved** the technical review is complete and the AD collection is sent for final sign-off
- Published** the AD collection data are successfully signed-off by an authorized person. At this stage, the AD collection is locked. It also means that the AD collection data are made available for data analyses and are ready for publication.

The AD collection **status** could be switched between "enabled", "disabled", and "deleted". When an AD collection is enabled, it is open for data entry and editing. When an AD collection is disabled, its contents can still be viewed, but not edited. When an AD collection is deleted, it is archived and no longer can be viewed or edited.

The left navigation pane sometimes shows green plusses. Click a plus to see the sub-menu of the menu:



5.4.2 Draft (enter AD collection)

This section is covered in section 6.1 AD Collections Data Entry Process on page 26.

5.4.3 Move to Review

After the AD collection data are entered and gaps are filled, you might want to send the AD collection for review.

To do so:

- In the List tab, click the pencil ("edit") icon at the AD collection you would like to send for review. The AD collection details screen will open.
- Enter the information in the **Reason for change** field (this is mandatory). This will flag why the AD collection needs a review. For example, "data entry is complete" or "issue fixed"
- Enter the information in the **Edition detail** field (this is also mandatory). You might want to note here who will be doing the review and when it will be complete.
- Scroll down and click the **Move to review** button on the bottom of the screen. SAGE will ask a confirmation for proceeding with the review.
- Click **OK** in the dialog box to proceed, otherwise, click **Cancel**.
- When the state is changed to **Review**, the data in the AD collection will be locked for editing unless an authorized user will change the AD collection status back to **Draft**.

5.4.4 Review

Once an AD collection is in the 'Review' state, authorized users (Administrators, or 'Power Users') can 'Reject' it back to 'Draft' state or 'Approve' it to be ready to approve.

5.4.5 Approve

After the review is complete, authorized users (Administrators, or 'Power Users') may accept or reject the reviewed AD collection. If it is rejected then it will become open for editing again.

- In the List tab, click the pencil ("edit") icon at the reviewed AD collection that you would like to approve. The AD collection details screen will open.
- Enter the information in the **Reason for change** field (this is mandatory). This will flag that the review results are accepted or rejected. For example, "review accepted".
- Enter the information in the **Edition details** field (this is also mandatory). You might want to note here who approved the AD collection and when. For example, "AD collection compiler has approved the AD collection on 31 January 2021".

5.4.6 Publish

After the review is approved, designated users (Administrators, or 'Power Users') may accept the reviewed AD collection or reject the reviewed version and open it for editing again. Here is what you need to do:

- In the List tab, click the pencil ("edit") icon at the approved AD collection that you would like to publish. The AD collection details screen will open.
- Enter the information in the **Reason for change** field (this is mandatory). This will flag that the review results are accepted. For example, "review accepted"
- Click 'Move to review' to reject or click 'Publish' to accept and publish

Enter the information in the **Edition details** field (this is also mandatory). You might want to note here who approved the AD collection and when. For example, "AD collection compiler has approved the AD collection on 31 January 2021".

6. Activity Data (AD) Collections – Energy

6.1 AD Collections Data Entry Process

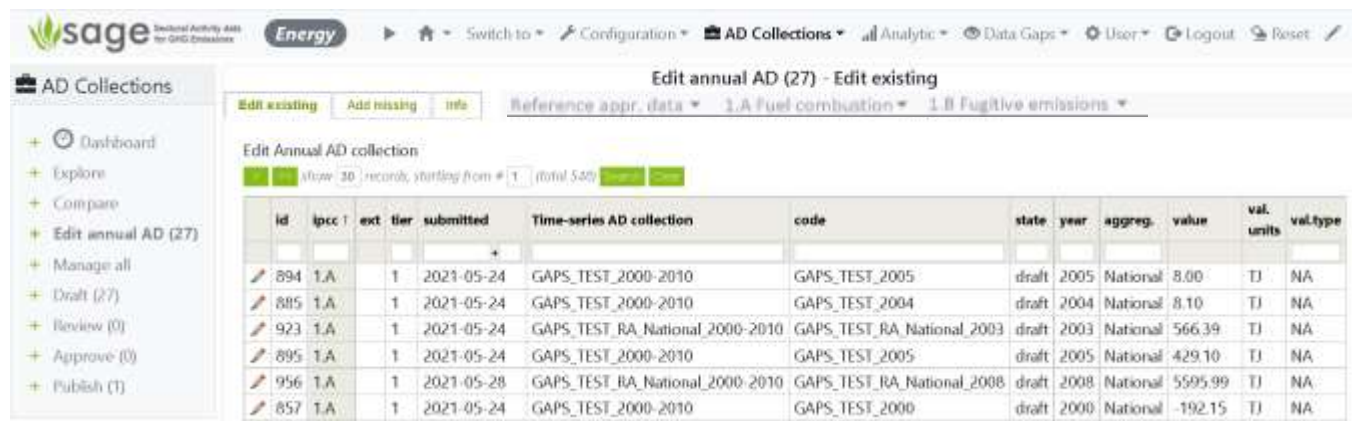
The AD collection data entry process is a subset of the ‘AD Collections’ process (see 5.1.1 *The overall ‘AD Collections’ process* on page 15).

6.1.1 Background

The AD collection drafting page enables you to view, insert, edit and delete AD collection activity data and information. But first, you have to select which AD collection you are going to work with. To do that:

Step 1 On the left, click ‘Edit annual AD’ to see the AD collections available for drafting. The list of AD collections available will appear. See **Figure 13**

Figure 13. Select AD Collection for data entry - Energy



The screenshot shows the 'Edit annual AD (27) - Edit existing' page in the Sage Energy system. The interface includes a sidebar with navigation options like Dashboard, Explore, Compare, Edit annual AD (27), Manage all, Draft (27), Review (0), Approve (0), and Publish (1). The main content area displays a table of AD collections. The table has columns for id, ipcc, ext, tier, submitted, Time-series AD collection, code, state, year, aggreg, value, val. units, and val.type. The table shows several rows of data, including GAPS_TEST_2000-2010 and GAPS_TEST_RA_National_2000-2010.

id	ipcc	ext	tier	submitted	Time-series AD collection	code	state	year	aggreg	value	val. units	val.type
894	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2005	draft	2005	National	8.00	TJ	NA
885	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2004	draft	2004	National	8.10	TJ	NA
923	1.A		1	2021-05-24	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2003	draft	2003	National	566.39	TJ	NA
895	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2005	draft	2005	National	429.10	TJ	NA
956	1.A		1	2021-05-28	GAPS_TEST_RA_National_2000-2010	GAPS_TEST_RA_National_2008	draft	2008	National	5595.99	TJ	NA
857	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2000	draft	2000	National	-192.15	TJ	NA

Step 2 At the top, click the AD collection to work on and then click the sector from the pop-up menu as below. See **Figure 14**

Figure 14. Obtain list of records for the selected AD collection

The screenshot shows the 'Edit annual AD (27) - Edit existing' interface. At the top, a dropdown menu is highlighted with a red box, containing 'Reference approach', '1.A Fuel combustion', and '1.B Fugitive emissions'. Below this, three boxes show the options for each: 'Reference approach' (List, Add, Export, Import, History, Info), '1.A Fuel combustion' (1.A Top-down model, 1.A.[1,2,4,5], 1.A.3.a T1, 1.A.3.a T2, 1.A.3.a T3, 1.A.5.* [1.A.3.a.i-mil] T1, 1.A.3.b T1,2, 1.A.3.c T1,2, 1.A.3.d T1, 1.A.3.e.[i,ii] T1), and '1.B Fugitive emissions' (1.B.1.a T1, T2, 1.B.1.a.i.3 T1, T2s, 1.B.2.b T1 Gas, 1.B.2.a T1 Oil). The background shows a table of records with columns: id, ipcc, ext, tier, submitted, Time-series AD collection, code, state, year, aggreg, value, val. units, and val.type.

The option tabs for record entries in the AD collection are the same as those for AD collection management, but they refer to a single record rather than the entire AD collection:

- List** displays a table with the list of records; each record has a “pencil” icon at the beginning (this is the edit option) and a “cross” icon at the end (to delete a record),
- Add** allows entry of a new activity data record that includes the fuel consumption value and relevant supplementary information (e.g., fuel characteristics, uncertainty, and comments),
- Export** allows exporting existing activity data to an Excel (CSV) file,
- Import** allows importing data from Excel templates (for all tables and records, and for entire time series),
- History** contains a log of changes performed on records within the module,
- Info** provides relevant notes and guidance helping you understand available options and how to use them

6.1.2 How to edit activity data records

To edit existing AD collection names and details:

- click the **List** tab. You will see the existing table with records. Each record has a **pencil** button on the left for editing
- to modify the existing entry - click the "pencil" button before the record, then make your modification using the form provided, and
- click **Save** to save the updated record.
- To remove a record from the list, click the **cross** icon at the end of the record.

6.1.3 How to add a new data record – manual entry

The process of adding a new activity data record is similar to adding a new AD collection. To add a new activity data record, click **Add** and then use the provided form to create a new record. This will include entering both activity data and supporting information.

This form includes three main sections – Reference approach (or top-down approach for fuel combustion), 1A Stationary Combustion, and 1B Fugitive emissions. For higher tiers (T2 and T3). SAGE provides additional entry fields to enable entries for combustion technology, operating conditions, control technology, maintenance quality, equipment age, and CO₂ captured.

When the entries are complete, SAGE calculates the value of the fuel consumption in TJ (so it is ready for entry in the IPCC equations) and saves the record in the database.

For higher tiers (T2 and T3). SAGE provides additional entry fields to enable entries as required (e.g., for combustion technology, operating conditions, control technology, maintenance quality, equipment age, and CO₂ captured).

*General information fields (all entries here are **mandatory**) (Figure 15 and Figure 16):*

Category	Select IPCC category for the data entry
Aggregation	Select the level of aggregation (national, regional, or facility) your data will represent. If additional aggregation levels are required (e.g., city, island, state) - they can easily be included by authorized users at the configuration level, please ask.
Statistics quality	Describe the reliability of the data used; your selection in this option will help SAGE to determine the correct default level of uncertainty for the activity data if the actual uncertainty is unknown.
Methodological tier	Identify the level of details required for the activity data entry.

Figure 15. Filling the general section in the activity data entry form - Energy

Figure 16. Filling a section in the activity data entry form - Energy

To choose the fuel and fuel characteristics:

1. Open an AD collection
AD collection menu at the top, then *Edit annual AD* menu item

2. Find the AD collection to change and click the pencil icon on its left.

Edit Annual AD collection

show 30 records, starting from # 1 (total 548) [Search](#) [Clear](#)

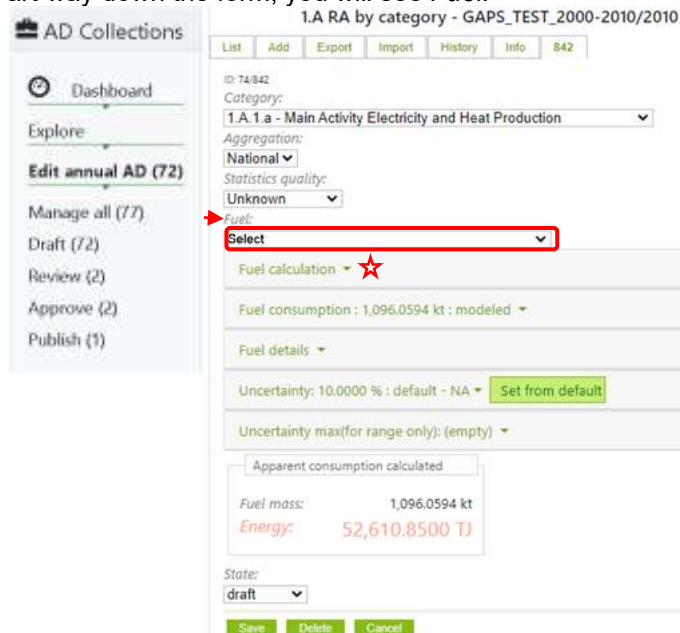
	id	ipcc	ext	tier	submitted	Time-series AD collection	code
	857	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2000
	Click to open/edit this record						GAPS_TEST_2002
	867	1.A		1	2021-05-24	GAPS_TEST_2000-2010	GAPS_TEST_2001

3. Near the top, click *Add* to add an item

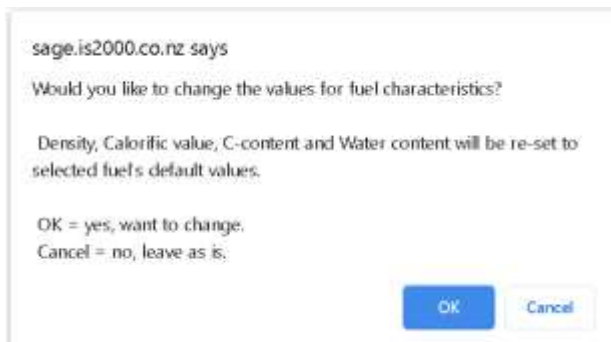
1.A.[1,2,4,5] – My AD_1990-2020

[List](#) [Add](#) [Export](#) [Import](#) [History](#) [Info](#)

4. Part-way down the form, you will see *Fuel*:



5. Click "Select" under *Fuel* and then click a fuel type to select it
6. Now you will see the following message:



Click 'OK' to proceed and change the values for fuel characteristics.

7. To calculate the amount of fuel consumed on the basis of nation-wide apparent consumption, next click *Fuel calculation* (marked with a red star above in the diagram of step 4) and the following will display.



Enter the source and calculation percentage and click *Calculate*.

*Fuel consumption fields (most entries here are **mandatory**) (Figure 17):*

Figure 17. Fuel section in the activity data entry fields

Fuel consumption

Value
Units
Type
Source
Reference

Value - enter the fuel consumption value

Units - select the unit of measurement for the fuel consumption value you have entered. If an additional unit is required - it can be added to the list of available units by authorized users at the configuration level, please make an inquiry.

Type - indicates if the data are coming from a survey (actual measurements and observation) or they are modelled (e.g., estimated on a basis of other parameters). If the entered datapoint is calculated using extrapolation, interpolation or other modeling techniques or suggested on a basis of an expert judgement, please select "modelled"

Source, Date issued (in format yyyy-mm-dd), and Reference - are for entering the detailed information on the data source and including additional comments (in the **Reference** field)

Uncertainty - can be selected as a default value (click **Select from default** link), in which case SAGE will provide the default value using the logical path suggested by the 2006 IPCC Guidelines. You can override this value if you have the actual (or more suitable) uncertainty data available for the entered fuel consumption.

Optional entry: if the uncertainty is not an IPCC default, and it is available in the form of a range, enter the top range figure in the field **Uncertainty max** (for range only).

Fuel (most entries here are mandatory)

This group includes intrinsic fuel characteristics used for unit conversion and emission estimates.

Fuel - select the fuel name from the list. Once the fuel is selected, SAGE will ask you if you would like to set/change all fuel characteristics to their default values. If you respond **OK** in the dialog box, all fuel characteristics will be set to their defaults. SAGE will display these values on the screen and flag them as "default". The characteristics include:

Density, which is used to recalculate volume-based units to mass (mandatory)

Calorific value to convert amount of fuel to energy value (TJ) used in most IPCC equations. You can also choose whether it is gross or net calorific value (GCV or NCV) and insert the conversion factor (if different from the 2006 IPCC default) (mandatory)

Carbon content of fuel, which also can be set as default or have a custom entry (mandatory)

Water content of fuel, which may be useful for wood-based fuels, for example (optional)

For each characteristic, if the value is not available by default, then you will need to provide the type of source, the source (actual data provider), the data published/accessed, and a reference/comment. If you chose the default characteristics then SAGE will enter this information for you automatically (**Figure 18 - Figure 20**).

For calorific value, the default is the NCV value. The steps you have to follow to fill this section are:

Step 1 Select fuel from the drop-down menu of fuels. Unless the same fuel has been selected for the previous entry, SAGE will offer to set the fuel characteristics to their default values.

Step 2 in the dialogue box, click **OK** to use default values, or **Cancel** to override with different values. If you click “Cancel”, you will need to enter the fuel characteristics manually, record the source for these data, and provide the reference (this is mandatory). An example of such entry for calorific value is included.

Figure 18. Fuel section in the activity data entry form – selecting fuel characteristics.

The screenshot shows a web form for entering activity data. On the left, under 'Details:', there are fields for 'Issued by:', 'Last edited by:', 'User: ()', and 'Date:'. Below this is a 'Fuel:' dropdown menu currently set to 'Gas/Diesel Oil'. To the right of the form, a dialog box is open with the title 'sage.is2000.co.nz says'. The dialog box contains the text: 'Would you like to change the values for fuel characteristics? Density, Calorific value, C-content and Water content will be re-set to selected fuel's default values.' It also includes instructions: 'OK = yes, want to change. Cancel = no, leave as is.' and two buttons: 'OK' and 'Cancel'.

Figure 19. Activity data entry form filled with default data and calculated energy consumption value

The screenshot shows the activity data entry form filled with default data. The 'Fuel:' dropdown is set to 'Crude Oil'. Below it, there are four empty dropdown menus for 'Density:', 'Calorific value:', 'Carbon content:', and 'Water content:'. Further down, there are several input fields: 'Value:' with '890', 'Units:' with 'kg/m3', 'Type:' with 'data from survey', 'Default/Custom:' with 'NA', 'Source:' with 'Laboratory report', 'Date issued:' with '2018-10-01', and 'Reference:' with 'www.crudeoilab.com, retrieved 25 November 2020 - this is the oil our country imports since 2012'.

Figure 20. Activity data entry form filled with default data and calculated energy consumption value

Category:
1.A.2.c ▾

Aggregation:
National ▾

Statistics quality:
Well developed ▾

Tier:
T1 ▾

Fuel consumption: 1000 m3 : data from survey ▾

Fuel:
Natural Gas ▾

Density: 0.724 kg/m3 : default ▾

Calorific value: 48 TJ/Gg : default ▾

Carbon content: 15.3 kg/kJ : default ▾

Water content: (empty) ▾

Tier 2 data ▾

Tier 3 data ▾

Uncertainty: 60 % : default - modeled data ▾ Select from default

Uncertainty max (for range only): (empty) ▾

Fuel mass:
0.000724 kt

Energy: 0.034752 TJ

State:
draft ▾

Add Cancel

Set methodological tier

In most categories, 2006 IPCC Guidelines require more detailed activity data for higher methodological tiers. SAGE provides additional menu options and entry fields to record these additional details.

For tier 2, the record will consist of the data and information provided for tier 1 plus the additional entry for tier 2. For tier 3, SAGE record the information provided for tiers 1 and 2 and the additional information entered for tier 3. Note that you may want to record country-specific values for fuel characteristics for higher tier estimations.

For tier 2, the additional information includes technology description (**Figure 21**). Tier 2 parameters may optionally be entered in tier 1.

For tier 3, the additional information includes **operation conditions**, **control technology**, **maintenance quality**, **equipment age**, and **CO₂ captured** (**Figure 22**). Tier 3 parameters may optionally be entered in tier 2 or tier 1.

E.g., Tier 1 may simply use default values for fuel characteristics (e.g., calorific values) and aggregated fuel type (e.g., oil)

Tier 2 may be more precise by having country-specific parameters for fuels and disaggregating fuels (not just oil, but identify specific oil fractions or/and sources)

Tier 3 may be more precise still, by having a value for each fuel for each country for different groups or individual oil wells, gas fields, or coal basins

Figure 21. Technology selection for tier 2

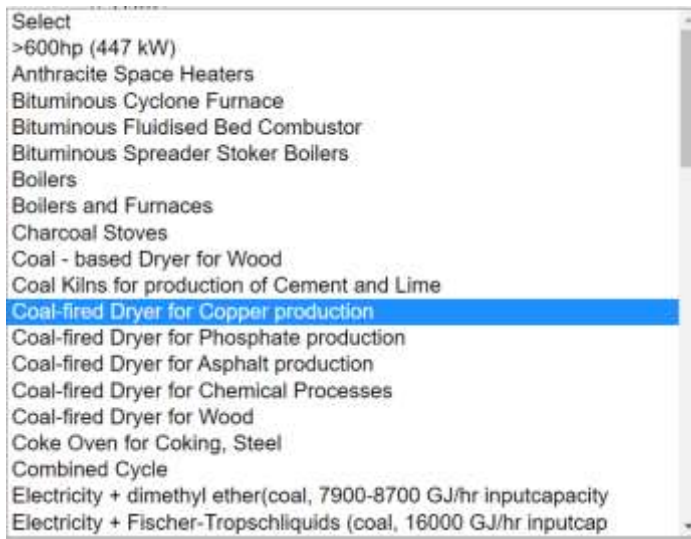


Figure 22. Additional entry fields for tier 3

Tier 3 data

- Operating conditions
- Control technology
- Maintenance quality
- Equipment age (years)
- CO2 captured (tonnes)

6.1.5 How to calculate energy consumption of fuels in TJ

SAGE calculates the energy consumption from fuel consumption and fuel data automatically as soon as the data are entered. The fuel energy consumption value is displayed under the entry form and is recorded in the database.

SAGE uses the IPCC methodology to calculate consumption.

To calculate emissions using the equations in the 2006 IPCC Guidelines, the fuel consumption should be converted to its energy value in Terajoules (TJ). The following processes apply:

GCV to NCV

For the energy calculation, SAGE checks if the calorific value is entered in NCV or GCV and converts it to NCV, if necessary, using the conversion factor entered by the user or the default IPCC value:

$$NCV = GCV \cdot \left[\frac{NCV}{GCV} \text{ conversion factor} \right]$$

Then, if the fuel consumption value is entered as a volume, the volume is converted to SI volume unit, then to mass using density in kg/m³, and then to energy using the SAGE's in-built unit converter and calorific value converted (if necessary) to GCV:

$$\text{Energy consumption (TJ)} = \text{Fuel consumption(volume)} \cdot \text{Base factor(SI)} \cdot \text{Density} \cdot \text{NCV} \rightarrow \text{TJ}$$

Consumption calculation

If fuel consumption is entered in mass units, they are first converted to SI units, then the calorific value is applied:

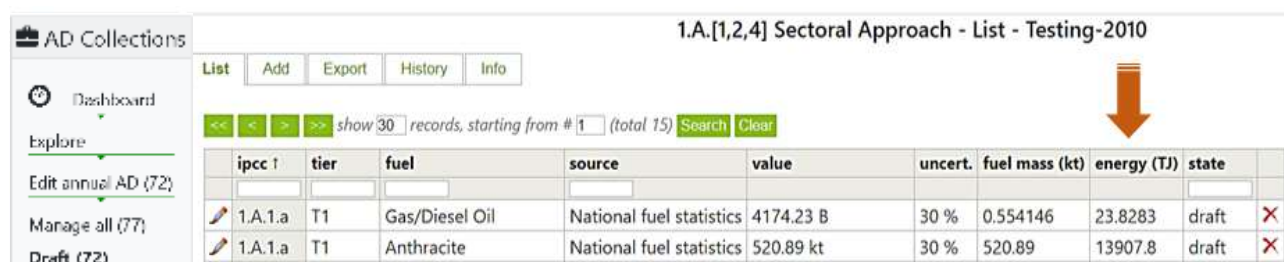
$$\text{Energy consumption (TJ)} = \text{Fuel consumption(volume)} \cdot \text{Base factor(SI)} \cdot \text{NCV} \rightarrow \text{TJ}$$

If fuel consumption is entered in energy units, they are first converted to SI base units, then to TJ:

$$\text{Energy consumption (TJ)} = \text{Fuel consumption value (energy)} \cdot \text{Base factor(SI)} \rightarrow \text{TJ}$$

The results of the calculation are displayed under the entry fields in the activity data entry form and can be viewed through the LIST tab of the AD collection draft (**Figure 23**).

Figure 23. SAGE calculates and displays the energy consumption for each activity data entry



1.A.[1,2,4] Sectoral Approach - List - Testing-2010

AD Collections

Dashboard

Explore

Edit annual AD (72)

Manage all (77)

Draft (72)

List Add Export History Info

<< < > >> show 30 records, starting from # 1 (total 15) Search Clear

ipcc t	tier	fuel	source	value	uncert.	fuel mass (kt)	energy (TJ)	state
1.A.1.a	T1	Gas/Diesel Oil	National fuel statistics	4174.23 B	30 %	0.554146	23.8283	draft
1.A.1.a	T1	Anthracite	National fuel statistics	520.89 kt	30 %	520.89	13907.8	draft

6.1.6 Estimating activity data using the top-down (“Reference”) approach

The “Reference approach” is a top-down method to measure consumption. That means it measures total of a fuel produced, imported, exported, bought/sold, international bunker fuels, and stock change to determine how much of fuel was consumed in the period (apparent consumption value).

SAGE can apply the reference approach to estimating apparent consumption by fuel to **individual fuel combustion categories**. For this, SAGE needs to know the total apparent consumption for a fuel across the entire combustion sector (1.A) and the proportion of the fuel consumed in a particular category (for example, by road transport category 1.A.3.b) for a year ‘X’.

This may initially seem complicated so a summary flow chart follows which may help.

Decide to use top-down (reference) approach

Add an AD collection for the year 'X', select 'Reference approach'

Enter the data (refer to section 6.1.6)

Will it only be for verification or will you use it to calculate consumption for a category?

Category consumption estimation

Verification only

End

In a different AD collection created using the 'Sectoral approach' for the same year 'X':

1. Choose 'Reference approach'

2. Select Fuel and use 'Fuel calculation' menu

3. Enter estimated percentage of consumption in the category of the total apparent consumption

SAGE will use the top-down approach to calculate the amount of fuel consumed by the selected category.

To enable comparison of fuel combustion calculated using the reference and sectoral approaches, the total apparent consumption for a fuel across the entire combustion sector (1.A) and all relevant data entries must be made in a separate annual AD collection.

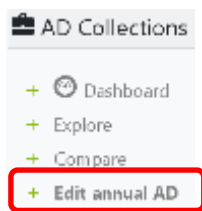
SAGE applies the approach described in the 2006 IPCC GLs (v.2, chapter 6, section 6.10.1) for default uncertainty if "default" is selected by users ($\pm 5\%$ for a given fuel if case of well-developed statistics and $\pm 10\%$ otherwise). However, if users know the actual uncertainties, then please enter those.

SAGE calculates and shows apparent consumption converted into kilotonnes (kt) and Terajoules (TJ).

To manage data for the reference approach:

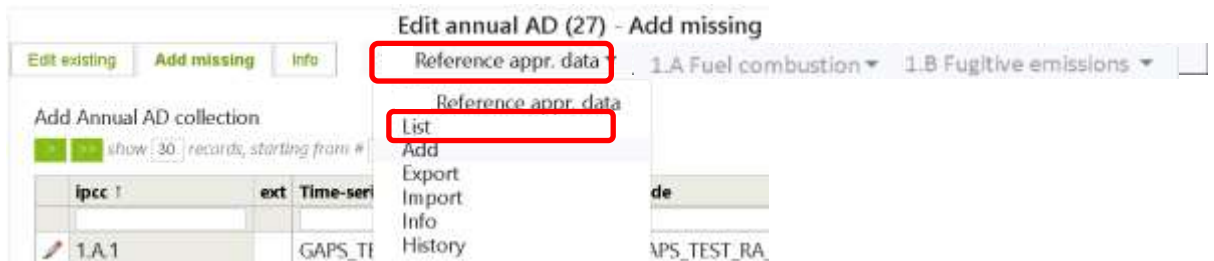
a. Click "AD Collections" (at the top menu)

b. Click "Edit annual AD" (in the left menu)



- c. At the top, click “Reference appr. data”, then click “List” in the pop-up menu (*Figure 24*)

Figure 24. Edit Reference appr. data



Something similar to the following will display (*Figure 25*).

Figure 25. List AD Collections using Reference approach

ID	submitted	time-series AD collection	year	fuel	fuel prod	fuel exp	fuel imp	int borders	fuel stock	aggreg	sector	fuel mass, kt	energy, TJ	state
154	2021-04-18	ENTRY TEST 2000-2005	2005	Cruise Oil	200.00 TJ	20.00 TJ	10,000,000.00 TJ	20,000.00 TJ	10.00 TJ	National	53	235,917.83	9,988,170.00	published
156	2021-05-24	GAPS_TEST_2000-2020	2000	Aviation	4.00 TJ	1.00 TJ	1.00 TJ	0.00 TJ	100.00 TJ	National	53	1,595,585.62	86.06	published
157	2021-05-24	GAPS_TEST_2000-2020	2000	Gas/Diesel Oil	0.00 TJ	0.00 TJ	10.00 TJ	2.15 TJ	200.00 TJ	National	53	4,460,664.65	192.11	published
158	2021-05-24	GAPS_TEST_2000-2020	2000	Natural Gas	0.00 TJ	0.00 TJ	62.00 TJ	0.00 TJ	0.00 TJ	National	53	1,705,333.33	52.00	published
159	2021-05-24	GAPS_TEST_2000-2020	2000	Wood/Wood Waste	0.00 TJ	0.00 TJ	0.00 TJ	0.00 TJ	0.00 TJ	National	53	152,828.31	0.00	published
160	2021-05-24	GAPS_TEST_2000-2020	2000	Jet Kerosene	0.00 TJ	0.00 TJ	479.37 TJ	71.41 TJ	0.00 TJ	National	53	1,204,988.95	405.84	published
161	2021-05-24	GAPS_TEST_2000-2020	2000	Motor Gasoline	0.00 TJ	0.00 TJ	946.34 TJ	0.00 TJ	0.00 TJ	National	53	21,362,076.75	946.34	published

Once you’re in the ‘AD collection’, ‘Reference approach’ component:

1. To show all records, click the “List” tab at the top



2. To edit a record, click the “List” tab near the top of the page and click the pencil icon (left of the particular record)

AD Collections

- Dashboard
- Explore
- Compare
- Edit annual AD (27)
- Manage all
- Draft (27)
- Review (0)
- Approve (0)
- Publish (1)

Reference appr. data - Record #554

List
Add
Export
Import
Info
History
Record #554

id: 42554
AD collection: ENTRY_TEST_2005
Category: 1.A - Fuel Combustion Activities
Aggregation: National
Statistics quality: Select
Fuel: Crude Oil

Fuel properties

Fuel Production : 200.0000 TJ : survey

Fuel Export : 20.0000 TJ : survey

Fuel Import : 10,000,000.0000 TJ : survey

International bunkers : 20,000.0000 TJ : survey

Fuel Stock change : 10.0000 TJ : survey

Uncertainty details [Set from default](#)

Uncertainty (symmetric OR min value for range): 0.0000 % : application default - modeled

Uncertainty max (max value, use for range only): (empty)

Apparent consumption calculated
Fuel mass : 235,937.6281 kt
Energy: 9,980,170.0000 TJ

State: published

Save Delete Cancel

While editing a record, you can change data in many fields.

Fuel Production

Value: 32092.029296875
Units: TJ
Type: survey
Default/Custom: NA
Source: Energy balance
Date issued: 2019-04-21
Reference: www.energybalance-report.country

Details:

- Issued by:
 - Organisation: Ministry of Economy
- Last edited by:
 - User: Admin (UNFCCC Data Collection Agency)
 - Date: 2021-05-13

'Category', 'Aggregation' and 'Statistics quality' have restricted-selection lists (click-and-pick). For "Aggregation" selection list, only the "National" option is available because the fuel consumption calculation for the top-down approach refers to the nation-wide apparent consumption value.

Click 'OK' to set all fuel characteristics to their default values.

To update data in an area like 'Fuel Calculation', you must be in a 'Top-down model' (not a 'Reference approach'). Click the green heading 'Fuel Calculation' and the relevant required information will be shown. 'Fuel Calculation' requires a name of the AD collection containing nation-wide apparent consumption values calculated across the entire fuel combustion sector for the same year as the current entry is associated with, and the percentage of the selected fuel (e.g., gas/diesel oil) consumed by the selected category (e.g., 10):

To update data in an area like 'Fuel Production', click on the green heading 'Fuel Production' and the relevant required information will be shown. 'Fuel Production' requires a value, units, data type (survey / modelled /etc.), data source, date issued in format yyyy-mm-dd, reference and comments are all needed.



SAGE also requires the following metadata in the 'Fuel consumption' area:

- type of data origin (e.g., modeled)
- Type of data source (menu '**Source**', e.g., top-down approach)
- when the data was issued/calculated (field '**Data issued**')
- Reference and/or comments (field '**Reference and comments**')
- Uncertainty value (to use the default value, click the green button '**Set from default**')

To save changes, click 'Save'.

To delete the record, click 'Delete'

To discard the changes and revert the record to what it previously was, click 'Cancel'.

3. To **delete** a record, click the top "List" and click the cross icon (on the right of the record)

4. To **add** a record, click the top "Add" tab and enter data for a new record



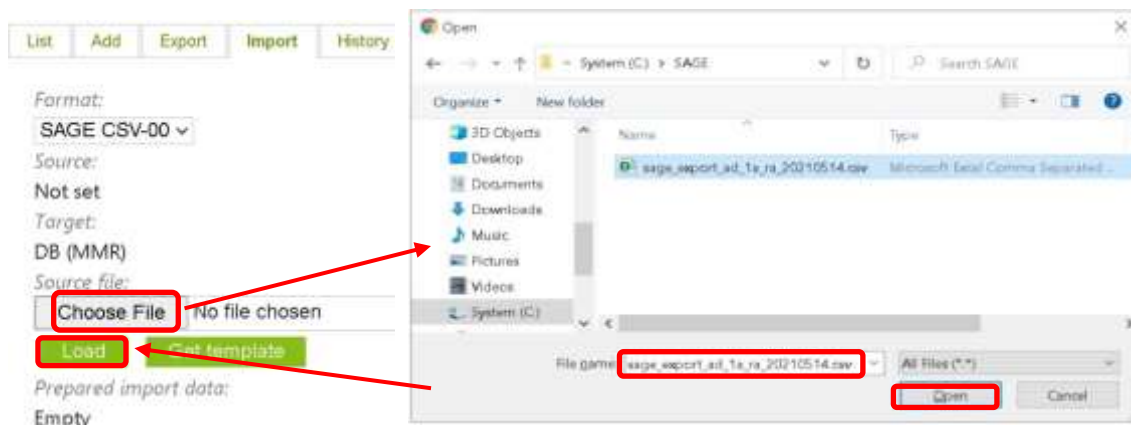
This shows a blank record. The process to add a record is similar to the edit process except it starts with a blank record. (Edit process is described above in '5.1.4 Explore' page 17).

5. To **Export** data, click the top "Export" tab, enter file name, enter description, choose output format if needed, click "Export All".

The file will save wherever your internet browser defaults to. In many internet browsers (e.g., Google Chrome), a link to the file will probably show at the bottom of the web page.



6. To **Import data**, click the top “Import” tab, choose an input format if needed, click “Choose File”, use the file browser to find the file, click “Open” in the file browser, click “Load” in Sage.



7. To **see edition history**, click ‘History’ tab at the top and it will show something similar to below.

Editions history

show 10 records, starting from 0 1 (total 2) Search Close

id	Time-series AD collection	irvey	code	year	date	num of records	state	status	edited by	edition reason	details
74	GAPS_TEST_2000-2010	GAPS_TEST	GAPS_TEST_2010	2010	2021-05-11 21:27:56	0	draft	enabled	Admin (UNFCCC Data Collection Agency)	testing	xxx
74	GAPS_TEST_2000-2010	GAPS_TEST	GAPS_TEST_20010	20010	2021-05-11 20:52:38	0	draft	enabled	Admin (UNFCCC Data Collection Agency)	New AD	by Admin; based on the ENTRY_TEST_2000-2005 data with gaps

8. To **see Information** about how to use the ‘Reference Approach’, click the Info tab at the top of the page.

Reference Approach - GAPS_TEST

List	Add	Export	Import	History	Info	783	777
------	-----	--------	--------	---------	------	-----	-----

It will show similar information of how to use the AD collection – Reference approach module.

Show all records

To show all records, click the "List" tab near the top of the page.

Add new record

To add a new record, click the "Add" tab near the top of the page and then use the provided form to create a new record. Please include the record name, code, and description.

Edit a record

Click the "List" tab near the top of the page and click the pencil icon (on the left of the record).

While editing a record, you can change data in many fields.

'Category', 'Aggregation' and 'Statistics quality' have restricted selection lists (click and pick).

To update data in an area like 'Fuel Production', click on the green heading 'Fuel Production' and the relevant required information will be shown. 'Fuel Production' requires a value, units, data type (survey / modelled / etc), data source, date issued, reference and comments are all needed.

Delete a record

Click the "List" tab near the top of the page and click the cross icon (on the right of the record).

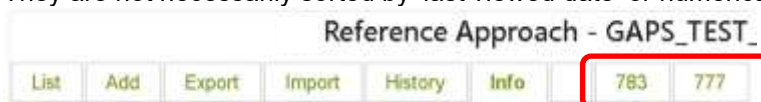
Export record(s)

To export a record or multiple records, click the "Export" tab near the top of the page. Enter file name, enter description, choose output format if needed, and click "Export All". The file will save wherever your internet browser defaults to. In many internet browsers, a link to the file will probably show at the bottom of the page.

Import record(s)

Click the "Import" tab near the top of the page. Choose an input format if needed, click "Choose File", use the file browser to find the file, click "Open" in the file browser, click "Load" in Sage.

- To **show the last record you viewed**, click the relevant tab at the top of the page. In the case below, the last record IDs viewed were 783 and 777. They are not necessarily sorted by 'last viewed date' or numerically.



To optionally edit that record, follow the "Edit" process above ('5.1.4 Explore' page 17).

6.1.7 Specific for 'Stationary Combustion' (St. Combustion)

To work on a 'combustion' AD collection, you can click on 'AD collection' at the top and then click pop-up menu 'Edit annual AD' (**Figure 26**).

Figure 26. Edit a 'combustion' AD



Then click '1.A (1,2,4,5) St. Combustion' in the body of the page and click pop-up menu '1.A (1,2,4,5)'.















Something similar to the following will be displayed (**Figure 27**):

Figure 27. List ‘combustion’ ADs

1.A.[1,2,4,5] - GAPS_TEST_2000-2010/2005 (GAPS_TEST_2005) - List

List Add Export Import History Info

show 30 records starting from # 1 (total 7) Select Clear

id	submitted	ipcc	tier	fuel	aggreg.	value	value type	source	uncert.	fuel mass (kt)	energy (TJ)	state	
 654	2021-05-11	1.A.1.a	T1	Natural Gas	National	1204.1139951171875 kt	modeled	National fuel statistics	10 %	1204.1139951171875	57797.76171875	draft	
 650	2021-05-11	1.A.1.a	T1	Anthracite	National	255256 t	modeled	National fuel statistics	10 %	255.25599670410156	6815.3349609375	draft	
 657	2021-05-11	1.A.1.b	T1	Gas/Diesel Oil	National	286.68798828125 kt	modeled	National fuel statistics	10 %	286.68798828125	12327.583984375	draft	
 663	2021-05-11	1.A.2.a	T1	Natural Gas	National	39.24869918823242 kt	modeled	National fuel statistics	10 %	39.24869918823242	1883.9376220703125	draft	
 672	2021-05-11	1.A.2.d	T1	Natural Gas	National	41.099998474121094 kt	modeled	National fuel statistics	20 %	41.099998474121094	1972.800048828125	draft	
 681	2021-05-11	1.A.4.b	T1	Wood/Wood Waste	National	538.1403912109375 kt	modeled	National fuel statistics	100 %	538.1409912109375	8395	draft	
 679	2021-05-11	1.A.4.b	T1	Natural Gas	National	102.03600311279297 kt	modeled	National fuel statistics	20 %	102.03600311279297	4897.72802734375	draft	

The ‘stationary combustion’ data entry form includes the following fields (see *Appendix B* for more detail of field contents options):

- Category
- Aggregation
- Statistics quality
- Tier
- Fuel consumption – Value
- Fuel consumption – Units
- Fuel consumption – Type

Once all data is entered, save the record.

6.1.8 Specific for ‘Transport’

To work on a ‘Transport’ AD collection, you can click on ‘AD collection’ at the top and then click pop-up menu ‘Edit annual AD’.

Then click ‘1.A (3,5) Transport’ in the body of the page and, in the pop-up menu, click whichever area you want to work on (*Figure 28*).

Figure 28. List of Transport sector items

Edit annual AD (27) - Edit existing

Edit existing **Add missing** **Info**

Reference approach: **1.A Fuel combustion** | 1.B Fugitive emissions

Edit Annual AD collection

show 30 records, starting from # 1 (total 548) Search Clear

id	ipcc	ext	tier	submitter	
954	1.A		1	2021-09	
911	1.A		1	2021-09	

To see the category names, hover over the category ID (**Figure 29**).

Figure 29. Category name screen tips

1.A Fuel combustion

- 1.A Top-down model
- 1.A.[1,2,4,5]
- 1.A.3.a T1
- 1.A.3.a T2** Civil Aviation Tier 1
- 1.A.3.a T3
- 1.A.5.* [1.A.3.a.i-mil] T1
- 1.A.3.b T1,2
- 1.A.3.c T1,2
- 1.A.3.d T1
- 1.A.3.e.[i,ii] T1

The 'transport' data entry form includes the following fields:
(See *Appendix B* for more detail of field contents options):

- Category
- Aggregation
- Statistics quality
- Tier
- Airport code
- Fuel consumption total – Value
- Fuel consumption total – Units
- Fuel consumption total – Type
- Fuel consumption total – Source
- Fuel consumption total – Date issued
- Fuel consumption total – Reference/comments
- Fuel – Type
- Fuel – Density
- Fuel – Calorific value – Value
- Fuel – Calorific value – Units
- Fuel – Calorific value – Type
- Fuel – Calorific value – Source
- Fuel – Calorific value – Date issued
- Fuel – Calorific value – Reference/comments
- Fuel – Carbon content – Value
- Fuel – Carbon content – Units

Fuel – Carbon content – Type

Once all data is entered, save the record.

6.1.9 Specific for ‘Fugitive Emissions’

Fugitive emissions

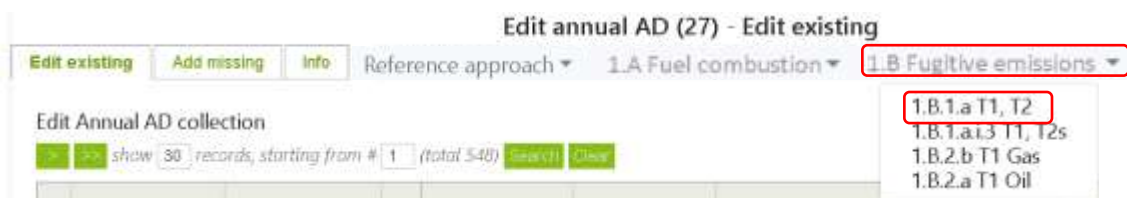
are presented in production units (not TJ the way fuel combustion emissions are)
are calculating emissions that escaped from other processes
are not related to use of fuels ((they're not combusting anything)
therefore have a different data interface than combustion emissions

To manage fugitive emissions,

click “AD collection” tab near the top of the page,

click “Edit annual AD” sub-menu or on the left of the page (**Figure 30**)

Figure 30. Editing Solid fuels data



Find the AD collection to work with in the body of the page

Click the popup menu item for that AD collection (titled 1.B.[1,2] Fugitive)

Click the relevant sub-section under either “Solid fuels” or “Oil and Natural gas” (**Figure 31**)

Figure 31. List editable inventories

Edit annual AD (27) - Edit existing

Edit existing

Add existing

1.A

Reference approach

1.A Fuel combustion

1.B Fugitive emissions

Edit Annual AD collection

1.A

1.B

1.C

1.D

1.E

1.F

1.G

1.H

1.I

1.J

1.K

1.L

1.M

1.N

1.O

1.P

1.Q

1.R

1.S

1.T

1.U

1.V

1.W

1.X

1.Y

1.Z

2.A

2.B

2.C

2.D

2.E

2.F

2.G

2.H

2.I

2.J

2.K

2.L

2.M

2.N

2.O

2.P

2.Q

2.R

2.S

2.T

2.U

2.V

2.W

2.X

2.Y

2.Z

3.A

3.B

3.C

3.D

3.E

3.F

3.G

3.H

3.I

3.J

3.K

3.L

3.M

3.N

3.O

3.P

3.Q

3.R

3.S

3.T

3.U

3.V

3.W

3.X

3.Y

3.Z

4.A

4.B

4.C

4.D

4.E

4.F

4.G

4.H

4.I

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4.M

4.N

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4.P

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4.S

4.T

4.U

4.V

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4.X

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5.A

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6.A

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6.L

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6.Q

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6.T

6.U

6.V

6.W

6.X

6.Y

6.Z

7.A

7.B

7.C

7.D

7.E

7.F

7.G

7.H

7.I

7.J

7.K

7.L

7.M

7.N

7.O

7.P

7.Q

7.R

7.S

7.T

7.U

7.V

7.W

7.X

7.Y

7.Z

8.A

8.B

8.C

8.D

8.E

8.F

8.G

8.H

8.I

8.J

8.K

8.L

8.M

8.N

8.O

8.P

8.Q

8.R

8.S

8.T

8.U

8.V

8.W

8.X

8.Y

8.Z

9.A

9.B

9.C

9.D

9.E

9.F

9.G

9.H

9.I

9.J

9.K

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9.M

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9.P

9.Q

9.R

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9.U

9.V

9.W

9.X

9.Y

9.Z

10.A

10.B

10.C

10.D

10.E

10.F

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10.H

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10.L

10.M

10.N

10.O

10.P

10.Q

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10.S

10.T

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10.W

10.X

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10.Z

11.A

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11.C

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11.M

11.N

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11.P

11.Q

11.R

11.S

11.T

11.U

11.V

11.W

11.X

11.Y

11.Z

12.A

12.B

12.C

12.D

12.E

12.F

12.G

12.H

12.I

12.J

12.K

12.L

12.M

12.N

12.O

12.P

12.Q

12.R

12.S

12.T

12.U

12.V

12.W

12.X

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13.A

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13.I

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13.K

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13.M

13.N

13.O

13.P

13.Q

13.R

13.S

13.T

13.U

13.V

13.W

13.X

13.Y

13.Z

14.A

14.B

14.C

14.D

14.E

14.F

14.G

14.H

14.I

14.J

14.K

14.L

14.M

14.N

14.O

14.P

14.Q

14.R

14.S

14.T

14.U

14.V

14.W

14.X

14.Y

14.Z

15.A

15.B

15.C

15.D

15.E

15.F

15.G

15.H

15.I

15.J

15.K

15.L

15.M

15.N

15.O

15.P

15.Q

15.R

15.S

15.T

15.U

15.V

15.W

15.X

15.Y

15.Z

16.A

16.B

16.C

16.D

16.E

16.F

16.G

16.H

16.I

16.J

16.K

16.L

16.M

16.N

16.O

16.P

16.Q

16.R

16.S

16.T

16.U

16.V

16.W

16.X

16.Y

16.Z

17.A

17.B

17.C

17.D

17.E

17.F

17.G

17.H

17.I

17.J

17.K

17.L

17.M

17.N

17.O

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For ‘1.B.1.a T1, T2 Underground & Surface mines’, enter:

Category	underground or surface
Aggregation level	usually National but there are many options to pick from
Statistics quality	unknown or well-developed
Tier	T1 or T2
Coal waste %	0 to 100
amount	value
Mine depth	metres
Tier2 basin name	name
basin location	place
Methane flared	value
units	e.g., kg
type	pick from survey, modelled, etc.

source	pick from '2006 IPCC default', 'ICAO', etc.
issued	date in format yyyy-mm-dd
reference	reference and comments
Methane utilised	value
units	e.g., kg
type	pick from survey, modelled, etc.
source	pick from '2006 IPCC default', 'ICAO', etc.
Date issued	date in format yyyy-mm-dd
Reference	reference and comments
Uncertainty	either set from default or else enter value
units	e.g., kg
type	pick from survey, modelled, etc.
source	pick from '2006 IPCC default', 'ICAO', etc.
issued	date in format yyyy-mm-dd
reference	reference and comments
Uncertainty max (for range only)	either set from default or else enter value
units	e.g., kg
type	pick from survey, modelled, etc.
source	pick from '2006 IPCC default', 'ICAO', etc.
issued	date in format yyyy-mm-dd
reference	reference and comments
State	pick 'draft' or 'published' (only certain users can 'publish')

For '1.B.1.a.i.3 – Abandoned underground mines', enter:

from	Aggregation level	usually National but there are many options to pick
	Statistics quality	unknown or well-developed
	Tier	T1 or T2
	Mines number	the number of mines
	Gassy mines fraction %	the percent of gassy mines
	Interval of mine closure	1900-1925, 1925-1950, 1950-1975, 1975-present
	Closed mines	the number of closed mines
	Tier2 coal rank	pick anthracite, bituminous or sub-bituminous
	Years since abandoned	enter year(s)
	Methane utilised	value
	units	e.g., kg
	type	pick from survey, modelled, etc.
	source	pick from '2006 IPCC default', 'ICAO', etc.
	Date issued	date
	Reference	reference and comments
	Uncertainty	either set from default or else enter value
	units	e.g., kg
	type	pick from survey, modelled, etc.
	source	pick from '2006 IPCC default', 'ICAO', etc.
	issued	date in format yyyy-mm-dd
	reference	reference and comments
	Uncertainty max (for range only)	either set from default or else enter value
	units	e.g., kg
	type	pick from survey, modelled, etc.
	source	pick from '2006 IPCC default', 'ICAO', etc.
	issued	date in format yyyy-mm-dd

	reference	reference and comments
'publish')	State	pick 'draft' or 'published' (only certain users can
For '1.B.2.b – Natural gas', enter:		
from	Aggregation level	usually National but there are many options to pick
	Statistics quality	unknown or well-developed
	Tier	T1 or T2
etc.	Gas type and origin*	pick from 'coal-bed methane', 'deep-cut extraction',
	Activity	pick from export, flaring, import, production, venting
	Value	value
	Units	pick from e.g., m ³
	Type	pick from survey, modelled, etc.
	Source	pick from '2006 IPCC default', 'ICAO', etc.
	Date issued	date
	Reference	reference and comments
	Uncertainty	either set from default or else enter value
	units	e.g., kg
	type	pick from survey, modelled, etc.
	source	pick from '2006 IPCC default', 'ICAO', etc.
	issued	date
	reference	reference and comments
	Uncertainty max (for range only)	either set from default or else enter value
	units	e.g., kg
	type	pick from survey, modelled, etc.
	source	pick from '2006 IPCC default', 'ICAO', etc.
	issued	date in format yyyy-mm-dd
	reference	reference and comments
'publish')	State	pick 'draft' or 'published' (only certain users can

For '1.B.2.a – Oil', the only difference from the above '1.B.2.b – Natural gas' is the selection for the 4th item (see * above).

Instead of "Gas type and origin", for 1.B.2.a Oil' the selection is

Oil type and origin	pick from 'bitumen API gravity < 10', etc.
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7. Activity Data (AD) Collections - IPPU

7.1 AD Collections Data Entry Process

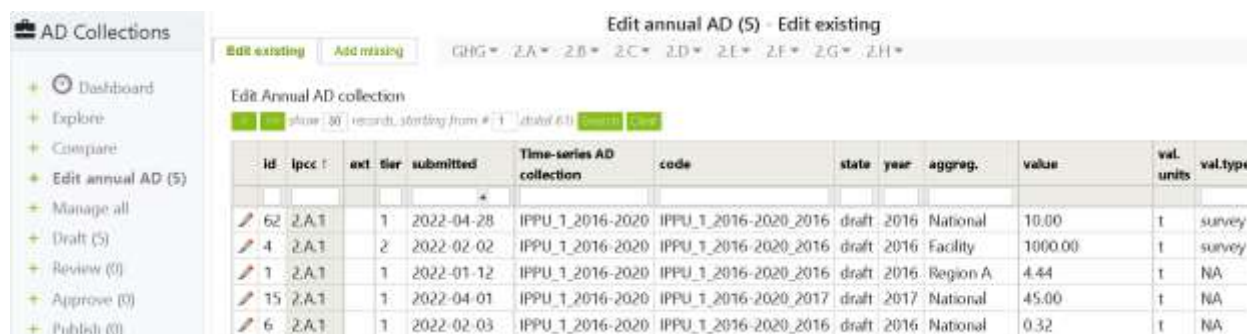
The AD collection data entry process is a subset of the 'AD Collections' process (see 5.1.1 *The overall 'AD Collections' process* on page 15).

7.1.1 Background

The AD collection drafting page enables you to view, insert, edit and delete AD collection activity data and information. But first, you have to select which AD collection you are going to work with. To do that:

In the left menu, click Draft and the system will show the list of AD collections available for drafting (**Figure 32**).

Figure 32. Select AD Collection for data entry - IPPU



id	ipcc	ext	tier	submitted	Time-series AD collection	code	state	year	aggreg.	value	val. units	val.type
62	2.A.1	1		2022-04-28	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016	National	10.00	t	survey
4	2.A.1	2		2022-02-02	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016	Facility	1000.00	t	survey
1	2.A.1	1		2022-01-12	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016	Region A	4.44	t	NA
15	2.A.1	1		2022-04-01	IPPU_1_2016-2020	IPPU_1_2016-2020_2017	draft	2017	National	45.00	t	NA
6	2.A.1	1		2022-02-03	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016	National	0.32	t	NA

The option tabs for record entries in the AD collection are the same as those for AD collection management, but they refer to a single record rather than to the entire AD collection:

- List** displays a table with the list of records; each record has a “pencil” icon at the beginning (this is the edit option) and a “cross” icon at the end (to delete a record),
- Add** allows entry of a new activity data record that includes the fuel consumption value and relevant supplementary information (e.g., fuel characteristics, uncertainty, and comments),
- Export** allows exporting existing activity data to an Excel (CSV) file,
- Import** allows importing data from Excel templates (for all tables and records, and for entire time series),
- History** contains a log of changes performed on records within the module,
- Info** provides relevant notes and guidance helping you understand available options and how to use them

7.1.2 How to edit activity data records

To edit existing AD collection names and details:

- click the **List** tab. You will see the existing table with records. Each record has a **pencil** button on the left for editing
- to modify the existing entry - click the "pencil" button before the record, then make your modification using the form provided, and

- click **Save** to save the updated record.
- To remove a record from the list, click the **cross** icon at the end of the record.

7.1.3 How to add a new data record – manual entry

The process of adding a new activity data record is similar to adding a new AD collection. To add a new activity data record, click **Add** and then use the provided form to create a new record. This will include entering both activity data and supporting information.

This form has nine category groups, shown by the tabs at the top. These are: GHG, 2A, 2B, 2C, 2D, 2E, 2F, 2G, and 2H.

Please note that GHG does not represent a particular IPPU category. It includes the capture and storage of greenhouse gases for each of the categories included in the sector. The form associated with the GHG tab, provides selection of category menu and for each category, selection of gases.

*General information fields (all entries here are **mandatory**) (Figure 33):*

- Category** Select IPCC category for the data entry
- Aggregation** Select the level of aggregation – national, regional, or facility – the list of aggregations relevant for your country will be set up in the relevant configuration table by your national inventory compiler. If additional aggregation levels are required (e.g., city, island, state) - they can easily be included by authorized users at the configuration level, please ask.
- Statistics quality** Describe the reliability of the data used; your selection in this option will help SAGE to determine the correct default level of uncertainty for the activity data if the actual uncertainty is unknown.
- Methodological tier** Identify the level of details required for the activity data entry.

The category you choose affects the data required in the form (e.g., GHG sector requires GHG gas details' whereas subcategories of 2.A.1 Cement production requires information about type of cement produced). The first example below is based on 'GHG' tab for recording GHG capture and storage, and the next example is based on one of the production and product use categories (2.A.1) (Figure 34).

Figure 33. Filling the general section in the activity data entry form - IPPU – category GHG

The screenshot shows the SAGE web interface for editing activity data. The 'Edit annual AD (4) - Edit existing' form is open, with the 'GHG' tab selected. The 'Add' button is highlighted. A table of existing records is visible at the bottom.

id	ipcc	ext	tier	subm	AD	code	state	year
62	2.A.1		1	2022-04-28	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016
4	2.A.1		2	2022-04-28	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016
1	2.A.1		1	2022-01-12	IPPU_1_2016-2020	IPPU_1_2016-2020_2016	draft	2016

Figure 34. Filling the general section in the activity data entry form - IPPU – category 2A

id	ipcc	ext	tier	submitted	Time-collec	state	year	aggreg.
66	2.A.1		1	2022-04-30	IPPU_1_2016-2020	draft	2017	National
2	2.A.1		1	2022-01-12	IPPU_1_2016-2020	draft	2016	Region B
22	2.A.1		1	2022-04-11	IPPU_1_2016-2020	draft	2020	National
15	2.A.1		1	2022-04-01	IPPU_1_2016-2020	draft	2017	National
62	2.A.1		1	2022-04-28	IPPU_1_2016-2020	draft	2016	National

Once the AD collection is selected, click 'Add' to add an item (**Figure 35**).

Figure 35. Adding activity data to IPPU – GHG category

AD collection: Choose the AD collection to add to.

Category: Mandatory: Select an IPCC category for the data entry e.g., cement production (2.A.1)

The system automatically shows the relevant fields and selectable items. Some categories (like cement production) can only produce GHG of CO₂ but some (e.g., 2.B.10 – Other) can produce a wide range of GHG's.

Aggregation: Mandatory: Select the level of aggregation (national, regional, or facility) your data will represent

Statistics quality: Mandatory: Describe the reliability of the data used

GHG: Select the greenhouse gas being reported

Reduction type: Select 'capture and store' or 'other'

GHG amount: Enter the value, units (e.g., tonnes, gigagrams), type (not applicable, survey, or modeled), source (e.g., IPCC, Expert judgement), date issued in format yyyy-mm-dd, and any reference/comments

Uncertainty for GHG amount: Enter the percentage value, type (survey or modeled), source (e.g., IPCC or expert judgement), and any reference/comments

When the entries are complete, SAGE calculates the amount of captured GHG or production (depending on category being reported) in the correct units in line with the 2006 IPCC Guidelines, and saves the record in the database. In the second example above, SAGE calculates the amount of Cement produced when button 'Add' is clicked (because category 2.A.1 was selected).

When the entries are complete, SAGE calculates the production or product usage value as required for entering into the IPCC equations and saves the record in the database.

7.1.4 How to add or edit gas Bank record

Only for the IPPU sector, only for category 2F items, there is an extra tab "Bank" (**Figure 36**).

Figure 36. IPPU – Bank



id	Time-series AD collection	code	ipcc	application	aggreg.	chemical	chem. produced	chem. exp.
20	IPPU_1_2016-2020	IPPU_1_2016-2020_2020	2.F.1.a	air-conditioning	National	HFC-134a	1,000.00 t	0.00 t

A "bank" is the amount of HFCs and other fluorinated ODS-substitutes contained in equipment in use. It is important for the inventory compiler to keep track of the bank and the flows of chemicals into and out of the bank. The following equation summarizes how the bank changes over the year due to emissions and other flows.

$$\text{Bank}_y = \text{Bank}_{y-1} + \text{Addition}_y - \text{Removal}_y$$

Where: Bank_y = Refrigerant bank on December 31st of year y, kg

Bank_{y-1} = Refrigerant bank on December 31st of year y-1/January 1st of year y, kg

Addition_y = Addition of new substances year y, kg

Removal_y = Removal of substances exported, emitted or destroyed year y, kg

In the bank calculating module, SAGE reads the input data from two sources:

- The configuration table "Gas bank data" (see Figure 37 below) – for each gas, each category, and application group, provides a year of gas introduction to the national market, growth rate in new equipment, lifetime, emission factor from installed base, and % of gas destroyed at End-of-Life
- The activity data record that provides the data for a particular gas consumed in a particular category and application (**Figure 37**)

Figure 37. IPPU – Gas bank configuration data

id	ipcc	appl.	ghg	intro year	growth rate, %	lifetime, years	installed base tE, %	destroyed tE, %
1	2.F.1.a	air-conditioning	HFC-23	1995	1.50	15	15.00	0.00
2	2.F.1.a	commercial	HFC-23	1997	1.50	15	15.00	25.00
3	2.F.1.a	transport	HFC-23	1997	1.50	9	15.00	25.00
4	2.F.1.a	industrial	HFC-23	1997	1.50	30	15.00	25.00
5	2.F.1.a	domestic	HFC-23	1997	1.50	20	15.00	25.00
6	2.F.1.b		HFC-23	1997	1.50	16	15.00	25.00

The 'Bank entry' data entry form is similar to other AD collection data entry forms. The 'Gas' in this form is sourced from the 'Gas' chosen in the related AD collection record (**Figure 38**).

Figure 38. IPPU – Bank entry

The banks are calculated as a time series for all the years entered by the users using the methodology described in the 2006 IPCC Guidelines¹. In the example above, the banks will be calculated from 1990 to 2023. If the "year from" entry precedes the year of the gas introduction, then the bank value for that year will be zero.

¹ https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/3_Volume3/V3_7_Ch7_ODS_Substitutes.pdf

8. Activity Data (AD) Collections - Agriculture

8.1 AD Collections Data Entry Process

The AD collection data entry process is a subset of the 'AD Collections' process (see 5.1.1 *The overall 'AD Collections' process* on page 15). For all categories, all methodological tiers presented in the IPCC national GHG inventory software are included.

8.1.1 Background

General

The Annual AD collection page enables you to view, insert, edit, and delete AD collection activity data and information.

To view, edit, remove, and enter new records, in the left menu of the page, click Annual AD and the system will show the list of existing annual AD collections and their records available for editing. Above the table with the existing annual AD collections, you will see the major agriculture sector category groups with drop-down lists (3.A and 3.C in the IPCC classification) (**Figure 39**).

Figure 39. Displaying annual data collections – Agriculture

The screenshot shows the 'Agriculture' section of the SAGE software. On the left is a navigation menu with options: Dashboard, Explore, Compare, Validate, Annual AD (4), Add existing, Add missing, Info, 3.A, 3.C, Manage all, and Draft (4). The main area displays a table titled '3.A.1 List'. The table has columns: ID, Time-series ADC, year, ipcc, cat, tier, agg, data col., livestock type, feed class, feed situation, climate, and days alive. The table contains 10 rows of data, each representing a different AD collection record with various attributes like year (2020, 2022), IPCC category (3.A.1.a, 3.A.1.b, 3.A.1.c), and livestock type (Dairy Cow, Sheep, etc.).

ID	Time-series ADC	year	ipcc	cat	tier	agg	data col.	livestock type	feed class	feed situation	climate	days alive
9	AG_TEST_2020-2023	2020	3.A.1.a	1	Bottom region	12	Dairy Cow	Mature	High-producing	Pasture	Polar Dry	1,825
56	AG_TEST_2020-2023	2023	3.A.1.a	1	National	12	Dairy Cow	Mature	High-producing	Pasture	Boreal Dry	1,825
10	AG_TEST_2020-2023	2020	3.A.1.a	3	Bottom region	12	Dairy Cow	Mature	High-producing	Ruminants on low-grain diet	Boreal Moist	1,825
62	AG_TEST_2020-2023	2022	3.A.1.c	2	National	12	Sheep	Mature	Ewes	Pasture	Cool Temperate Dry	2,190
47	AG_TEST_2020-2023	2023	3.A.1.c	1	National	12	Sheep	Mature	Ewes	Pasture	Cool Temperate Moist	2,190
60	AG_TEST_2020-2023	2022	3.A.1.c	2	National	12	Sheep	Mature	Ewes	Free-range	Boreal Moist	2,190
59	AG_TEST_2020-2023	2020	3.A.1.c	1	National	12	Sheep	Mature	Ewes	Free-range	Boreal Dry	2,190
63	AG_TEST_2020-2023	2023	3.A.1.a	3	National	12	Cattle	Mature	Ewes	Pasture	Tropical Dry	3,650
58	AG_TEST_2020-2023	2020	3.A.1.f	1	National	12	Horses	Mature	Ewes	Pasture	Boreal Dry	10,950
18	AG_TEST_2020-2023	2022	3.A.1.b	1	Bottom region	12	Mature	Ewes	Free-range	Confinement	Boreal Dry	365

Three options on the left let you work with the entire pool of records from all available collections, categories, and years:

- Edit existing – to view and edit the existing records
- Add missing – to identify which category entries are missing for each of the agriculture sector categories for each collection according to the years each AD collection covers. These can be filtered to rationalize the viewed information. Some generic information is offered for each missing record. To complete a missing record, click a “pencil” icon. This will prompt you to enter the missing information and data and then save the record. This method is useful if one or two records are missing. To do a more systematic and extensive data entry, use category drop-down lists (3.A and 3.C, see sections 8.2.1 – 8.2.2 below).
- Info – a brief description of available options on the page.

Working with individual categories

Please note that in the IPCC classification, the agriculture sector and the land use, land-use change, and forestry sector are presented in the form of one sector – AFOLU. To match the categories included under the UNFCCC classification (and MPGs under the Paris Agreement), the following IPCC categories are covered under the agriculture sector in SAGE:

3.A.1 – Enteric Fermentation

3.A.2 – Manure Management

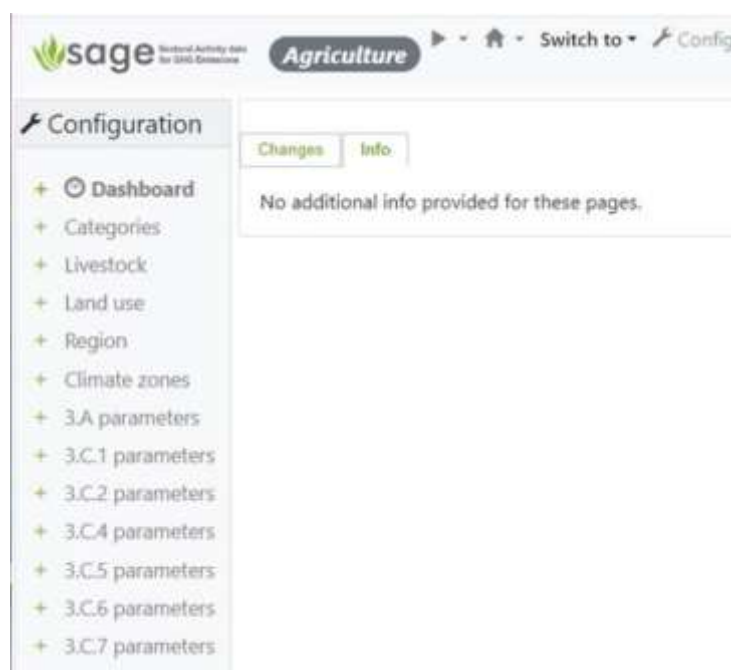
- 3.C.1.b – Burning in Cropland
- 3.C.1.c – Burning in Grassland
- 3.C.2 – Liming
- 3.C.3 – Urea Application
- 3.C.4 – Direct N₂O Emissions from managed soils
- 3.C.5 – Indirect N₂O emissions from managed soils
- 3.C.6 – Indirect N₂O emissions from manure management
- 3.C.7 – Rice cultivation
- 3.C.12 – N₂O emissions from aquaculture

In SAGE, these categories are grouped into several category groups that use the same background data set up in the configuration tables by technical inventory experts.

For each category, some parameters are not likely to change on an annual basis and others are expected to be changed from year to year. Parameters not likely to undergo an annual change are entered and stored in the **configuration tables**. The entries in these tables should be made only by authorized technical experts or the inventory compiler. These entries will define the available selection options in the data entry forms, and the default parameters (from the 2006 IPCC Guidelines or country-specific).

All configuration tables for the Agriculture sector are grouped by category or category family (e.g., configuration tables for 3.A.1 and 3.A.2 categories are grouped as 3.A). The tables that serve more than one category, are displayed above the category-specific tables (**Figure 40**).

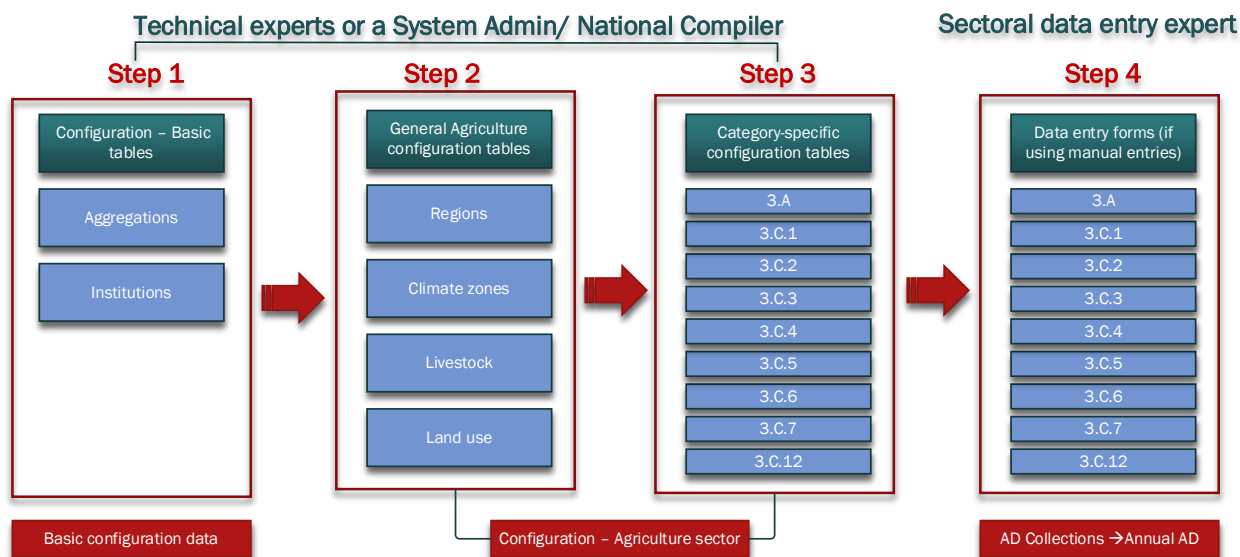
Figure 40. Agriculture sector-specific configuration tables - overview



The general configuration tables and the category-specific category tables need to be filled in and checked BEFORE the category entries are made in the relevant entry forms (see further details on the Agriculture sector configuration tables in 12.2 How to manage Configuration tables on page 136).

In the Agriculture sector, there is a dependency between some categories, therefore, some category entries should be done before the others. **Figure 41** below shows a general order of filling the activity data forms and the configuration tables. Section 8.1.3 provides general guidance for using data entry forms regardless of the category, and sections 8.1.4 to 8.1.13 provide guidance for each category group-specific configuration table requirements and data entry forms.

Figure 41. The general order of filling the configuration tables and the category data entry forms in the agriculture sector.



BEFORE YOU START:

Note that **some parameters are NOT MANDATORY** for some tiers and some field entries are not mandatory for entering the configuration parameters or the data entry forms. Those parameters and fields have an option ANY. If you do not have specific information that would allow selection of such parameter or such field entry, just select ANY. If this option is not available, then it is mandatory to select a specific value from the option selection list.

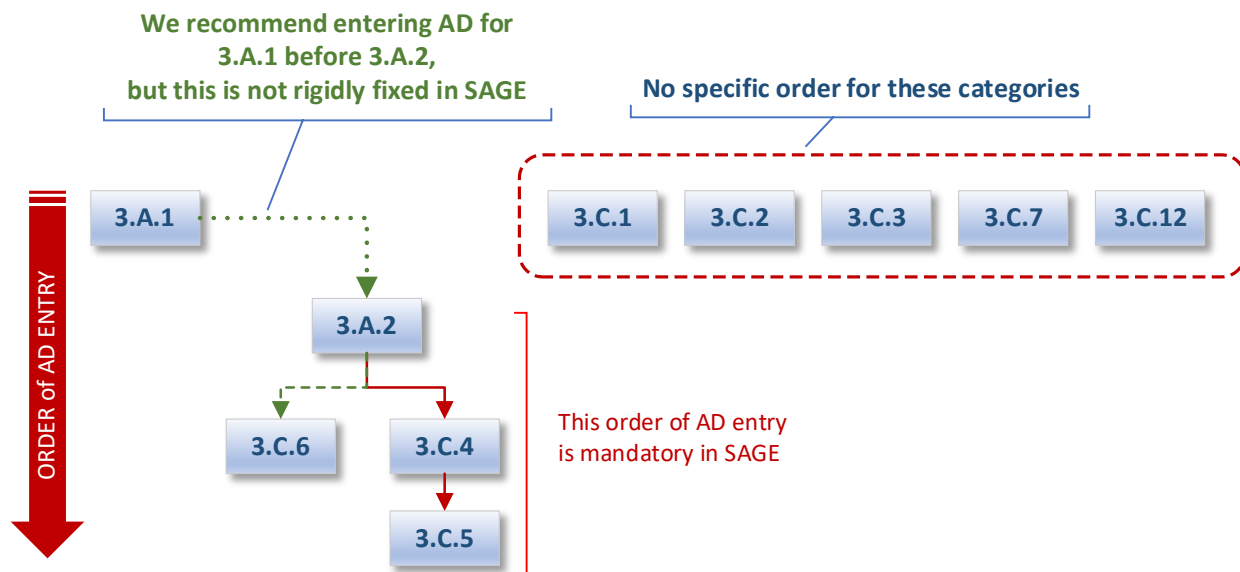
IMPORTANT:

In the Agriculture sector, different categories may use the same data entries. To maintain data consistency, enter category data in the order as follows (and as shown in **Figure 42**).

The following are constraints for the data entry order applied in SAGE:

- Part of the data for a record in one category is taken from another category (e.g., some entries in 3.A.2 category records are used by 3.C.4 category, therefore, entries in 3.A.2 category must be done first)
- Some values in one category could be made by using entries from another category as an option (e.g., using the “**Set from 3.A.2 AD**” button for category 3.C.6)
- Consistency of values between categories may not be enforced rigidly but can be checked using the function “Validate” in the AD collections. This function displays the same variable used in different categories and shows whether their values are the same or different.

Figure 42. Order of category entries in SAGE



8.1.2 How to start adding a new data record – common steps for all categories

This section explains the steps and form entry options that are common for all categories in the agriculture sector in SAGE.

To start working with the records in the individual categories with a few common steps that are required for each category in the agriculture sector regardless of the category grouping:

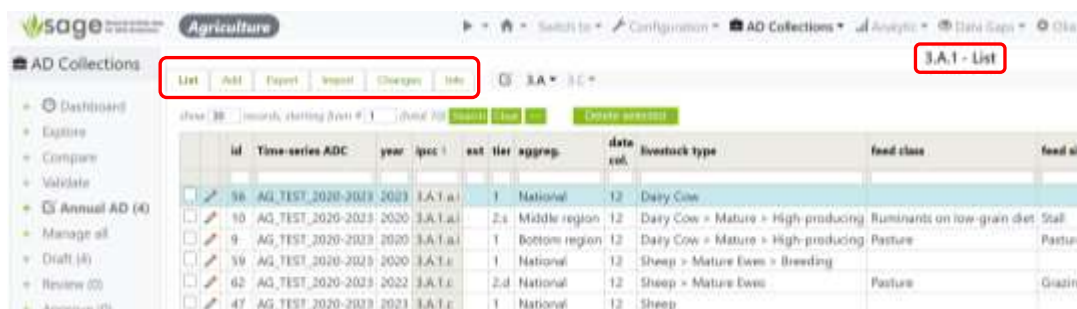
- **select a category** from a relevant drop-down list above the records table (3.A and 3.C).

The example below is based on one of the waste categories (3.A.1). (Figure 43).

Figure 43. Selection of a category in SAGE (example – 3.A.1 category)

Annual AD (4) - Edit existing

id	ipcc t	ext	tier	Time-series AD collection	state	year	aggreg.	value
9	3.A.1.a.i		1	AG_TEST_2020-2023	draft	2020	Bottom region	5000
10	3.A.1.a.i		2	AG_TEST_2020-2023	draft	2020	Middle region	1000
56	3.A.1.a.i		1	AG_TEST_2020-2023	draft	2023	National	1000
59	3.A.1.c		1	AG_TEST_2020-2023	draft	2020	National	1111
47	3.A.1.c		1	AG_TEST_2020-2023	draft	2023	National	5600
62	3.A.1.c		2	AG_TEST_2020-2023	draft	2022	National	1000
60	3.A.1.c		2	AG_TEST_2020-2023	draft	2022	National	1000
63	3.A.1.e		2	AG_TEST_2020-2023	draft	2022	National	1000
66	3.A.1.f		1	AG_TEST_2020-2023	draft	2020	National	1000



The option tabs for record entries in the AD collection are the same as those for AD collection management, but they refer to a single record rather than to the entire AD collection:

List displays a table with the list of records; each record has a “pencil” icon at the start (to edit a record) and a “cross” icon at the end (to delete a record),

Add allows entry of a new activity data record that includes the fuel consumption value and relevant supplementary information (e.g., fuel characteristics, uncertainty, and comments),

Export allows exporting existing activity data to an Excel (CSV) file,

Import allows importing data from Excel templates (for all tables and records, and for entire time series),

Changes contains a log of changes performed on records within the module,

Info provides relevant notes and guidance helping you understand available options and how to use them

The process of adding a new activity data record is similar to adding a new AD collection.

Similar to the energy, IPPU, and waste sectors, the agriculture sector categories have generic (common) and category-specific information fields to hold category-specific parameters that change from category to category. The category you choose affects the data required in the form. Once both generic and category-specific information and data are entered, click ‘Add’ to add an item.

8.1.3 How to add new activity data records – common to all agriculture categories

- Select category group from the drop-down lists above the record table (3.A, 3.C, **Figure 43** above).
- Click tab **Add** and then use the provided form to create a new record. The category AD entry form will appear.
- In the provided category AD entry form, select the **Annual AD collection** name from the drop-down list in the form.
- Select **Category** with the required extension from the drop-down list in the form.
- Select general information options in the provided drop-down lists:
 - **Aggregation** level (e.g., *national*)
 - **Statistics quality** (either *well developed* or *unknown*)
 - Methodological **Tier** (e.g., *T1*)
 - Optional: Select **Data collection period** in months (in different countries, the agricultural data are collected within different timeframes and with different frequencies; the default value is 12 months)

- Enter both activity data and supporting information in the provided information fields and menu items from the drop-down lists in the form
- For each entered parameter value:
 - mandatory entries:
 - **parameter value** (sometimes it can be entered from the default or the other category – SAGE will provide the button to do so)
 - **Units** of measurement (select from the drop-down list underneath the parameter field unless it is specified in the parameter name)
 - **Source** of data/information – select from the provided drop-down list.
 - source information **Type** (*survey* for actual data and *modelled* otherwise)
 - optional entries:
 - **Date issued** to let others know when this data has been published/made available/recorded in format yyyy-mm-dd.
 - **Reference and comments** to record the link to the information source and make notes that might be useful to others – for example, this record is provisional, the final value will be available on dd/mm/yy from <person/organization>.
- Enter **Uncertainty**:
 - Option 1: click the button **Select from default** – SAGE will assign the value a default uncertainty according to the 2006 IPCC Guidelines
 - Option 2: use the manual entry to enter the country-specific uncertainty value in the provided information fields and enter the source for the uncertainty data.
- Select the **State** of the record (*draft* = you might come back to it and re-check or *ready* = the record is final and ready for review).
- Click the green button **Add** on the bottom of the form
- If you wish to enter more records (e.g., for the next year) – click again tab **Add** above the record (the one near **List**), and the new form pre-filled with the previous information will appear. This is a quick way of entering several records because you only need to make small edits in the provided entries and then again click the green button **Add** on the bottom of the form without going to the main record page.

When the entries are complete, SAGE provides the summary of parameters as required for entering into the IPCC equations and saves the record in the database (**Figure 44**).

Figure 44. A records summary generated by SAGE

	id	Time-series ADE	year	ipcc	ext	tier	aggreg.	data col.	livestock type	feed class	feed situation	ch
	9	AG_TEST_2020-2023	2020	3.A.1.a	1	Bottom region	12	Dairy Cow > Mature > High-producing	Pasture	Pasture	Pasture	
	10	AG_TEST_2020-2023	2020	3.A.1.a	2.s	Middle region	12	Dairy Cow > Mature > High-producing	Ruminants on low-grain diet	Stall		
	56	AG_TEST_2020-2023	2023	3.A.1.a	1	National	12	Dairy Cow				
	47	AG_TEST_2020-2023	2023	3.A.1.c	1	National	12	Sheep				
	59	AG_TEST_2020-2023	2020	3.A.1.c	1	National	12	Sheep > Mature Ewes > Breeding				
	62	AG_TEST_2020-2023	2022	3.A.1.c	2.d	National	12	Sheep > Mature Ewes	Pasture		Grazing large areas	

8.2 Category-specific data entries

8.2.1 Category group 3.A

This category group consists of two categories – 3.A.1 – Enteric fermentation and 3.A.2 – manure management.

Consistency between categories

The livestock parameters should be consistent between categories 3.A.1 and 3.A.2. To check if the numbers are consistent, use Validation function in SAGE (**Figure 45**).

Figure 45. Use Validation function to check consistency between categories in SAGE

Time-series	year	aggregation	livestock type	climate	feed class	feed situation	3.A.1 average population	3.A.2 average population	valid	state
AG_TEST_202...	2023	National	Camels	Tropical Dry	Pasture	Grazing large...	100000		✗	draft
AG_TEST_202...	2020	National	Sheep > Mat...	Boreal Dry			1111		✗	draft
AG_TEST_202...	2020	National	Horses	Boreal Dry			10000	10000	✓	draft
AG_TEST_202...	2020	Middle region	Dairy Cow > ...	Boreal Moist	Ruminants o...	Stall	1000000		✗	draft
AG_TEST_202...	2022	Top region	Poultry > Tur...	Boreal Moist	Free-range			232	✗	draft
AG_TEST_202...	2020	National	Sheep > Gro...	Warm Tempe...	Free-range	Housed ewes		2466	✗	draft

If column “valid” shows a **green tick**, the values in the corresponding line entered for 3.A.1 and 3.A.2 are consistent. A **red cross** in column “valid” shows that the entries are inconsistent or missing. The same approach can be used for checking consistency between entries in other categories.

The category selection in SAGE follows the IPCC approach and includes a combination of the process leading to GHG emissions + basic livestock type (**Figure 46**). For example,

- 3.A.1> Livestock > Enteric Fermentation> Cattle> Dairy Cattle or
- 3.A.2> Livestock > Manure Management > Cattle> Dairy Cattle

Figure 46. Category selection in SAGE

3.A.1 - Record #9

Category:

- 3.A.1.a.i > Livestock > Enteric Fermentation > Cattle > Dairy Cattle
- 3.A.1.a.ii > Livestock > Enteric Fermentation > Cattle > Non-Dairy Cattle
- 3.A.1.b > Livestock > Enteric Fermentation > Buffalo
- 3.A.1.c > Livestock > Enteric Fermentation > Sheep
- 3.A.1.d > Livestock > Enteric Fermentation > Goats
- 3.A.1.e > Livestock > Enteric Fermentation > Camels
- 3.A.1.f > Livestock > Enteric Fermentation > Horses
- 3.A.1.g > Livestock > Enteric Fermentation > Mules and Asses
- 3.A.1.h > Livestock > Enteric Fermentation > Swine
- 3.A.1.j > Livestock > Enteric Fermentation > Other livestock

Category-specific fields additional to those described in section 8.1.3 include:

- Data collection period (months) (default is on the annual basis = 12 months)
- Feeding class and diet (select **Any** if unknown)
- Feeding situation (select **Any** if unknown)
- Climate zone (select specific climate zone most applicable to your country or make regional entries)
- Livestock type (contains livestock subdivisions available for the selected category)

Once Livestock category is selected, additional entry blocks appear:

- Number of animals produced annually
- Animal days alive – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click “Update” button to display the complete record on the screen and, if everything is correct, press “Add” button to save your record and add it to the collection (**Figure 47**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for the review, change the state to “ready” (**Figure 47**). The example below is for the category 3.A.1, tier 1. If a higher tier is selected (T2 simplified or T2 detailed), the principal structure of the form will not change, but additional fields will appear to accommodate the data for the higher tier sectors.

When you pressed “Add” button, SAGE displays the list of all records for the category (**Figure 48**).

Figure 47. Entering the data in category group 3.A.

The screenshot shows the '3.A.1 - Add' form in the Sage Sectoral Activity data for GHG Emissions interface. The form is divided into several sections, each with a red box and an annotation:

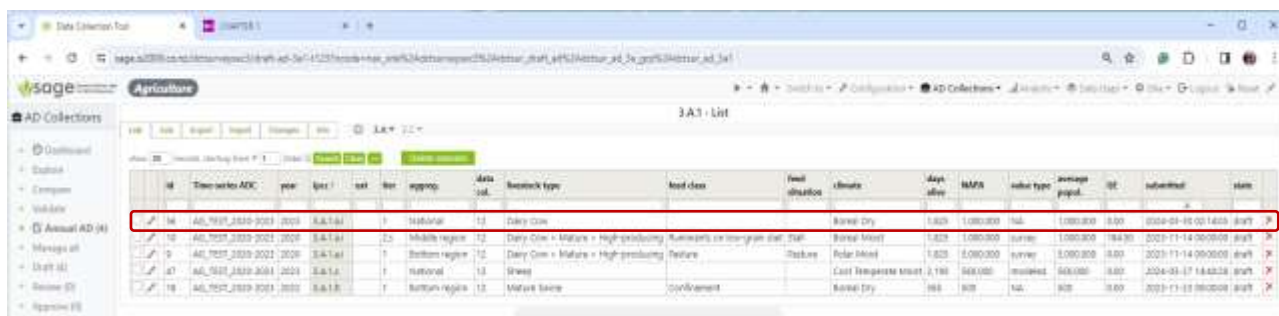
- Common data for all categories:** This section includes fields for 'Annual AD collection' (AG_TEST_2020-2023_2023), 'Category' (3.A.1.a.i > Livestock > Enteric Fermentation > Cattle > Dairy Cattle), 'Aggregation' (National), 'Statistics quality' (Unknown), and 'Tier' (T1).
- Category-specific settings:** This section includes fields for 'Data collection period (months)' (12), 'Feeding class and diet' (Any), 'Feeding situation' (Any), 'Climate zone' (Boreal Dry), and 'Livestock type' (Dairy Cow).
- Data entry fields that appear after Livestock type is selected:** This section includes fields for 'Number of animals produced annually (NAPA, within set options)' (1000000), 'Animal days alive' (1825), 'Uncertainty details' (Set from default), 'NAPA uncertainty' (20.00 %), and 'Animal days alive uncertainty' (20.00 %).
- Calculated by SAGE:** This section includes a 'Calculated' tab and a field for 'Annual average population' (1,000,000.0).
- Parameters used for calculations:** This section includes a 'Parameters' tab and a table of configuration defaults.

The table of configuration defaults is as follows:

name	code	var.name	value	units	uncert.%	description
Number of days alive	days-alive	DA	1,825.00	number	20.0	Number of days alive (DA).

At the bottom of the form, there is a 'State' dropdown menu set to 'draft' and three buttons: 'Add', 'Update', and 'Cancel'. A red arrow points to the 'Add' button with the annotation: 'Save the record and add it to the collection (for new records this will be the "ADD" button; for edited records – the "Save" button)'.

Figure 48. The list of records is updated



ID	Time-series AD	year	type	cat	agg	data col	livestock type	food class	food situation	climate	days off	NMS	value type	average popul.	qt	submitted	state
16	AD_7937_2019-2021_2020	2020	S.A.1.a1	1	National	12	Dairy cow			Temperate dry	1.823	1,080,000	145	1,080,000	0.00	2024-04-01 00:14:00	draft
17	AD_7937_2019-2021_2020	2020	S.A.1.a1	23	Bottom region	12	Dairy cow + Mature + High-producing	Ruminants on irrigated soil, Pasture		Temperate moist	1.823	1,080,000	surveys	1,080,000	184.90	2023-11-14 09:05:00	draft
18	AD_7937_2019-2021_2020	2020	S.A.1.a1	1	Bottom region	12	Dairy cow + Mature + High-producing	Pasture	Stocking	Polar moist	1.823	1,080,000	surveys	1,080,000	0.00	2023-11-14 09:05:00	draft
19	AD_7937_2019-2021_2020	2020	S.A.1.a1	1	National	13	Sheep			East Temperate moist	2.196	648,000	measured	648,000	0.00	2024-03-17 14:43:28	draft
18	AD_7937_2019-2021_2020	2020	S.A.1.b	1	Bottom region	13	Mature Sows	Confinement		Temperate dry	886	800	145	800	0.00	2023-11-13 08:00:00	draft

8.2.2 Category group 3.C

Category group 3.C consists of categories that include the data on aggregate sources and non-CO₂ emissions sources on land. In the UNFCCC classification under the ETF, some of these categories describe the agriculture sector, and some – the LULUCF (Land use, land-use change, and Forestry) sector. SAGE recognizes this subdivision. The categories that cover the **agriculture sector** data include:

Two subcategories associated with biomass burning in agricultural lands:

3.C.1.b – Burning in Cropland

3.C.1.c – Burning in Grassland

Two categories that describe special cases of application of chemicals to improve the productivity of agricultural lands:

3.C.2 – Liming

3.C.3 – Urea application

Three categories describing activities associated with direct and indirect N₂O emissions from agricultural lands:

3.C.4 – Direct N₂O emissions from managed soils

3.C.5 – Indirect N₂O emissions from managed soils

3.C.6 – Indirect N₂O emissions from manure management

One category that describes activities associated with rice cultivation:

3.C.7 – Rice cultivation

One category that describes N₂O emissions from aquaculture:

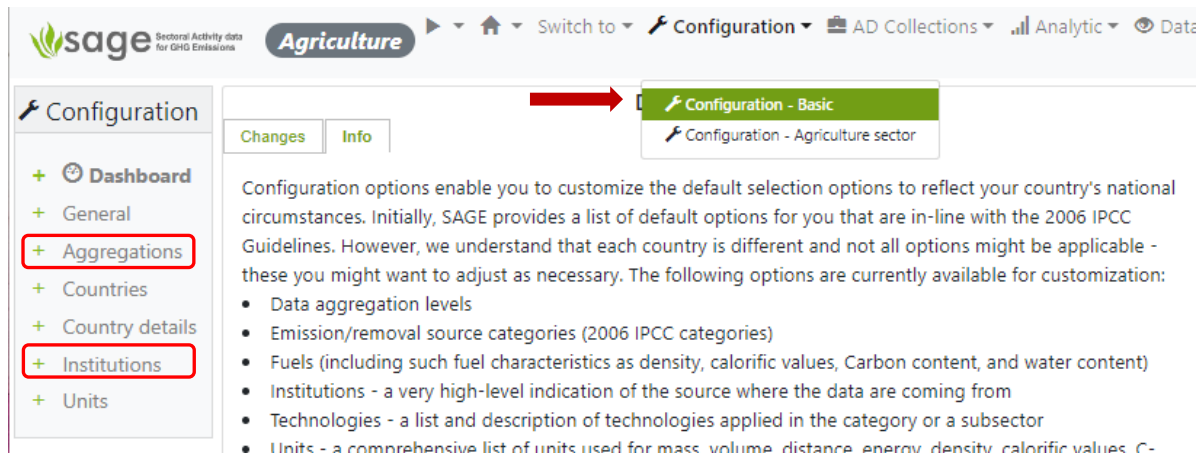
3.C.12 – N₂O emissions from aquaculture

8.2.2.1 Burning in agricultural lands (3.C.1.b and 3.C.1.c)

Step 1 The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

Figure 49. Configuration – basic tables; Aggregations and Institutions table links are in the red frames

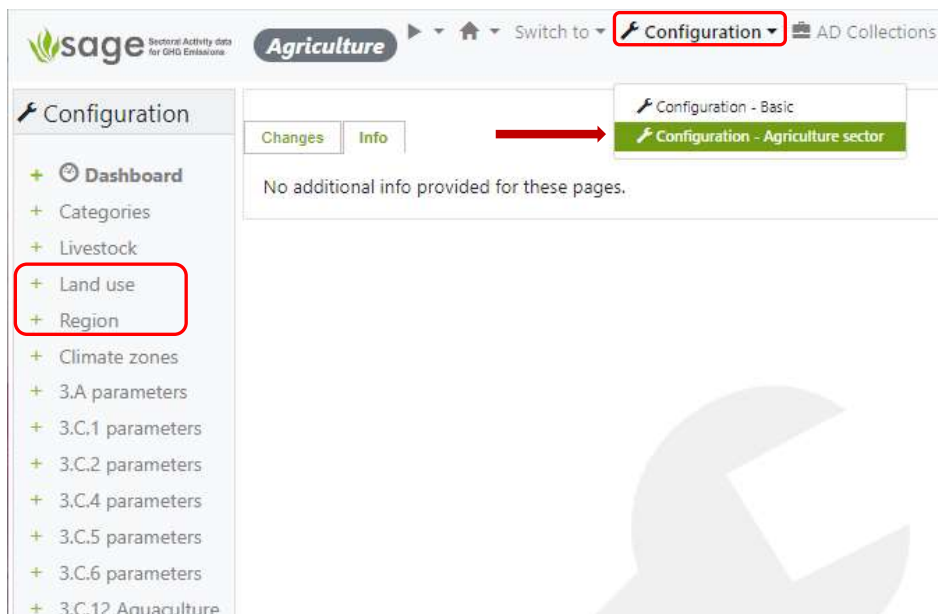


(For more details, see '12.2 How to manage Configuration tables' on page 136)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Configuration – Agriculture sector > Tables (Regions, Land use) (Figure 50)

Figure 50. Configuration – Agriculture sector tables; Land use and Region table links are in the red frames

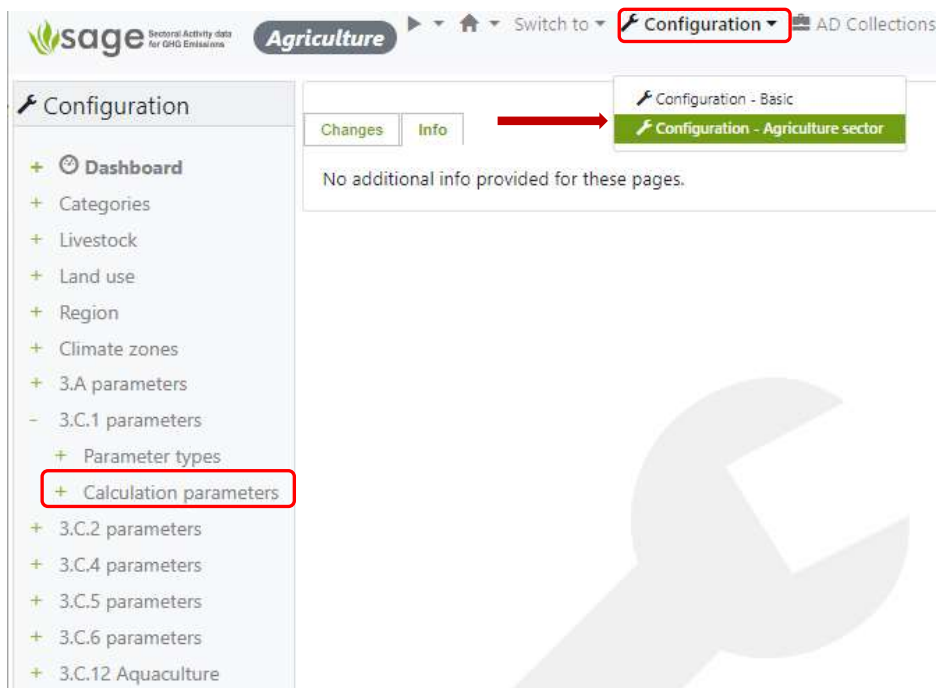


Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.1 section in the agriculture category-specific section of the configuration tables:

Configuration – Agriculture sector > 3.C.1 > Calculated parameters (

Figure 51)

Figure 51. Configuration – Agriculture sector category-specific tables for 3.C.1; Calculated parameters link is in the red frame



Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

For this category SAGE offers two agriculture-related subcategories categories – 3.C.1.b – Burning in cropland and 3.C.1.c – Burning in grassland.

The category selection in SAGE follows the IPCC approach and includes a combination of the process leading to GHG emissions + land use type where the process occurs (**Figure 52**). For example,

- 3.C.1.b > Burning > Enteric Fermentation > Cropland or
- 3.C.1.c > Burning > Enteric Fermentation > Grassland

Figure 52. Category selection in SAGE

The screenshot shows the SAGE 'AD Collections' interface. On the left is a sidebar with navigation options: Dashboard, Explore, Compare, Validate, **Annual AD** (highlighted with a red box), Manage all, Draft, Review, Approve, and Publish. The main area is titled '3.C.1 - Add' and contains a form with buttons: List, **Add** (highlighted with a red box), Export, Import, Changes, and Info. A message bar at the top says 'Form entry details updated'. The form fields include: 'Annual AD collection:' with a dropdown set to 'AG_TEST_2020-2023_2023'; 'Category:' with a dropdown menu open showing '3.C.1.b > Burning > Cropland' (highlighted with a blue bar), '3.C.1.b > Burning > Cropland', and '3.C.1.c > Burning > Grassland'; 'Statistics quality:' with a dropdown set to 'Unknown'; and 'Tier:' with a dropdown set to 'T1'.

Category-specific fields additional to those described in section 8.1.3 include:

- Region (select **Unspecified** if unknown or not applicable)
- Land unit code (enter the appropriate land use code, and ensure that the code is used consistently across the inventory)
- Current land use type (select from the provided options as applicable)
- Initial land use type (select from the provided options as applicable)
- Fire type (select **Any** if unknown)
- Burning activity type (select from the provided options as applicable)
- C pool (select from the provided options as applicable)

Please note that all selection options appear as they are set in the configuration tables. If the selection menu does not include an option that should be applicable, consult with your technical expert or the system administrator and request adding this option in the relevant configuration tables.

Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- Area burnt (in ha)
- Mass of fuel available for combustion (= fuel stock), (t d.m./ha)
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

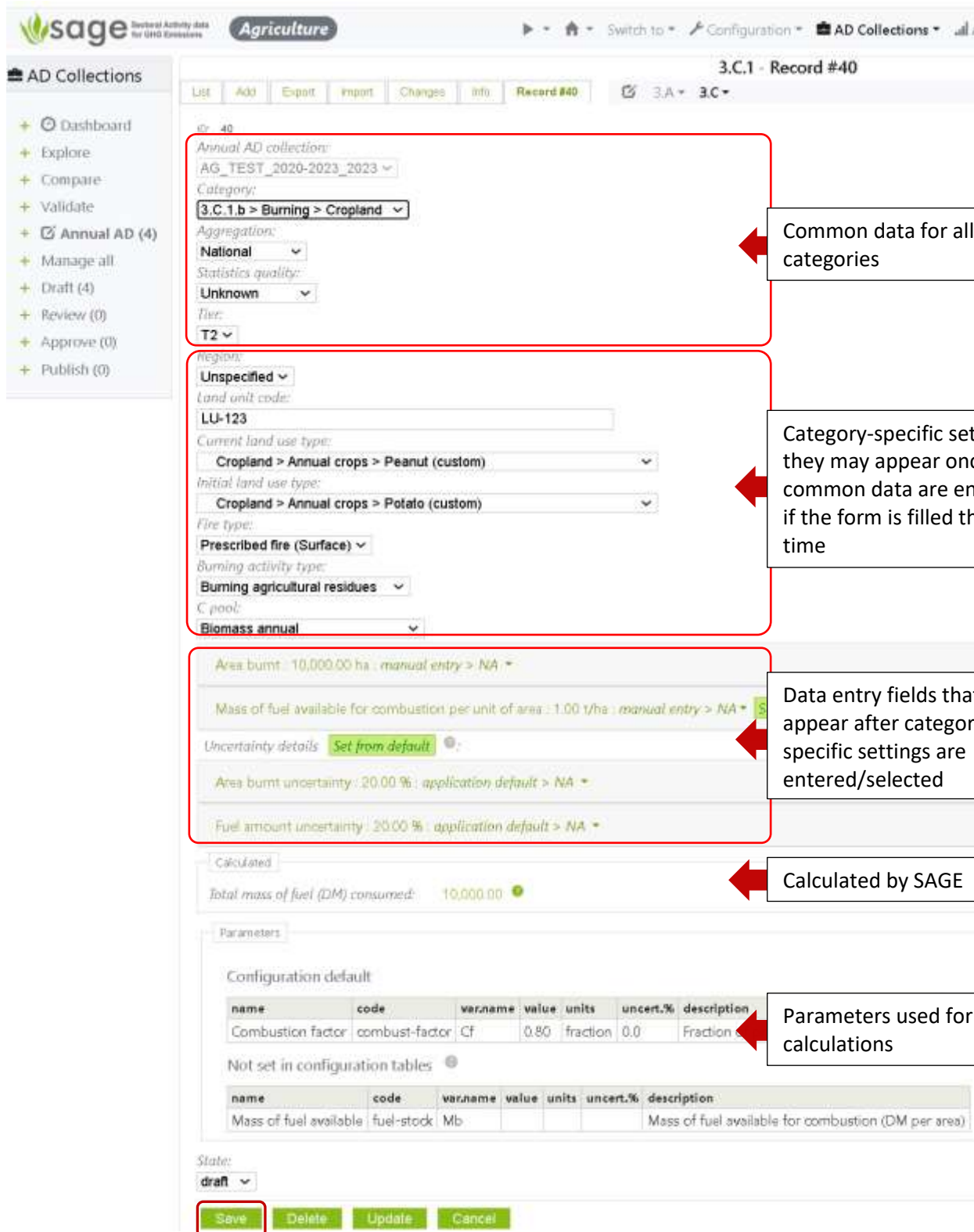
- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click “Update” button to display the complete record on the screen and, if everything is correct, press “Add” button to save your record and add it to the collection (**Figure 53**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for the review, change the state to “ready” (**Figure 53**). The example below is for the category 3.C.1.b, tier 1. If a higher tier is selected, the principal structure of the form will not change, but it is expected that the activity data are further disaggregated by regions.

When you pressed “Add” button, SAGE displays the list of all records for the category (**Figure 53**).

Figure 53. Entering the data in category group 3.C.1



AD Collections

Dashboard
Explore
Compare
Validate
Annual AD (4)
Manage all
Draft (4)
Review (0)
Approve (0)
Publish (0)

Agriculture

3.C.1 - Record #40

List Add Export Import Changes Info Record #40

3.A 3.C

Annual AD collection:
AG_TEST_2020-2023_2023

Category:
3.C.1.b > Burning > Cropland

Aggregation:
National

Statistics quality:
Unknown

Tier:
T2

Region:
Unspecified

Land unit code:
LU-123

Current land use type:
Cropland > Annual crops > Peanut (custom)

Initial land use type:
Cropland > Annual crops > Potato (custom)

Fire type:
Prescribed fire (Surface)

Burning activity type:
Burning agricultural residues

C pool:
Biomass annual

Area burnt: 10,000.00 ha : manual entry > NA

Mass of fuel available for combustion per unit of area: 1.00 t/ha : manual entry > NA

Uncertainty details Set from default

Area burnt uncertainty: 20.00 % : application default > NA

Fuel amount uncertainty: 20.00 % : application default > NA

Calculated

Total mass of fuel (DM) consumed: 10,000.00

Parameters

Configuration default

name	code	varname	value	units	uncert.%	description
Combustion factor	combust-factor	Cf	0.80	fraction	0.0	Fraction

Not set in configuration tables

name	code	varname	value	units	uncert.%	description
Mass of fuel available	fuel-stock	Mb				Mass of fuel available for combustion (DM per area)

State:
draft

Save Delete Update Cancel

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Common data for all categories

Category-specific settings; they may appear once the common data are entered if the form is filled the first time

Data entry fields that appear after category-specific settings are entered/selected

Calculated by SAGE

Parameters used for calculations

Figure 54. The list of records is updated

id	Time-series ADC	year	type	ext	tier	aggreg.	land unit code	current land use	initial land use	fire type	C pool	burning activity type	region	area burnt	fuel amount	fuel consumed
40	AG_TEST_2...	2023	3.C.1.b		2	National	10-125	Peanut		Prescribed...	Biomass an...	Burning ag...		10,000.00 ha	1.00 t/ha	10,000.00
9	AG_TEST_2...	2020	3.C.1.b		1	National	wheat	Annual crops		Controlled...	Biomass+D...	Burning ag...		2,000.00 ha	0.80 t/ha	1,600.00
7	AG_TEST_2...	2020	3.C.1.c		1	National	grassland-f...	Managed		Controlled...	Biomass+D...	Burning ag...		1,000.00 ha	2.00 t/ha	2,000.00

8.2.2.2 Liming and Urea application (3.C.2 and 3.C.3)

The principal steps in entering the activity data for 3.C.2 and 3.C.3 categories are the same. The differences are noted in the steps below.

Step 1 for these categories is the same as for subcategories of category 3.A. The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

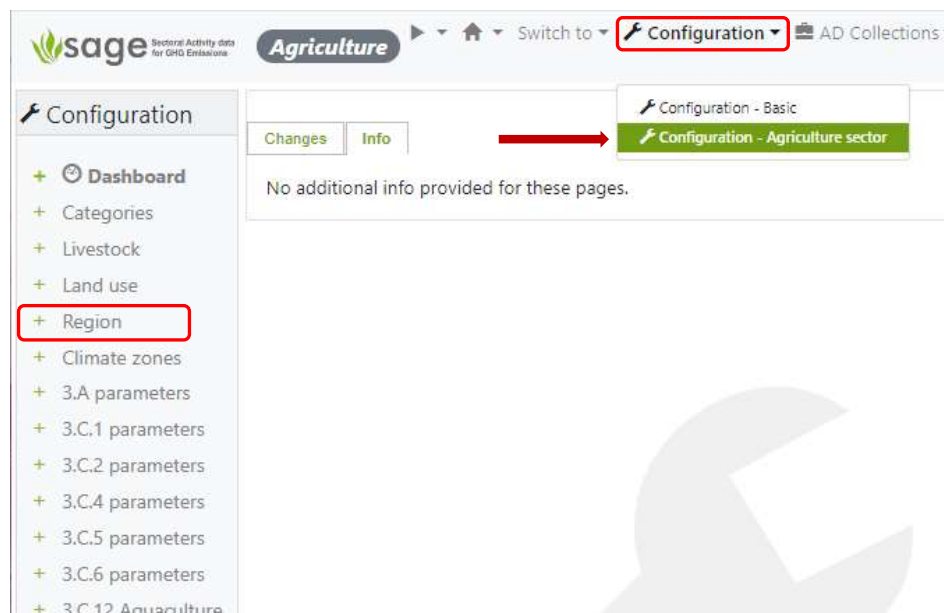
Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

(For more details, see '12.2 How to manage Configuration tables' on page 136)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Configuration – Agriculture sector > Table (Regions) (Figure 55)

Figure 55. Configuration – Agriculture sector tables; Region table link is in the red frame



Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.1 section in the agriculture category-specific section of the configuration tables:

For 3.C.2: Configuration – Agriculture sector > 3.C.2 > Tables (Site, Calculated parameters) (Figure 56)

For 3.C.3: no additional tables

Figure 56. Configuration – Agriculture sector category-specific tables for 3.C.2

Site and Calculated parameters table links are in the red frame

id	parameter	code	year	aggregation	line type	land use	region	site	var	value	units	source
3	Lime purity	lime-purity		Any	Dolomite					95.0000	%	Engineering website
1	Lime purity	lime-purity			Limestone					98.0000	%	Country-specific
4	Water content	water-content			Dolomite					6.0000	%	Engineering website
2	Water content	water-content			Limestone					2.5000	%	Engineering website

Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

For each of the two categories, the category selection in SAGE follows the IPCC approach and includes a combination of the processes leading to GHG emissions (**Figure 57**). For example,

- 3.C.2 > Liming or
- 3.C.3 > Urea application

Figure 57. Category selection in SAGE

AD Collections

3.C.3 - Add

ID:

Annual AD collection: Select

Category: 3.C.3 > Urea Application

National

Statistics quality: Unknown

Tier: T2

Land use type: Unspecified

Region:

Category-specific fields additional to those described in section 8.1.3 include:

- Region (select **Unspecified** if unknown or not applicable)
- Land use type (select from the provided options as applicable)
- Calculation approach (select from the provided options as applicable)

- For 3.C.2 only:
 - Lime type (select from the provided options as applicable)
 - For T2 and T3 – Site (select **Unspecified** if not applicable or unknown)
- For 3.C.3 only:
 - For T2 and T3 – Carbon content, % (carbon content of urea, enter **20** if country-specific value is not available)

Please note that all selection options appear as they are set in the configuration tables. If the selection menu does not include an option that should be applicable, consult with your technical expert or the system administrator and request adding this option in the relevant configuration tables.

Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- Amount of chemical applied (**Lime** for 3.C.2 and **Urea** for 3.C.3)
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click “Update” button to display the complete record on the screen and, if everything is correct, press “Add” button to save your record and add it to the collection (**Figure 58**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 58**). The example below is for the category 3.C.1.b, tier 1. If a higher tier is selected, the principal structure of the form will not change, but it is expected that the activity data will be further disaggregated by region.

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 59**).

Figure 58. Entering the data in category group 3.C.3 (similar to 3.C.2)

3.C.3 - Add

Form entry details updated

ID: AG_TEST_2020-2023_2023

Annual AD collection: AG_TEST_2020-2023_2023

Category: 3.C.3 > Urea Application

Aggregation: National

Statistics quality: Well developed

Tier: T2

Land use type: Cropland > Annual crops

Region: Top region

Calculation approach: Direct application

Carbon content, %: 20

Urea applied : 1,000.00 t : manual entry > NA

Uncertainty details Set from default

Urea applied uncertainty : 20.00 % : application default > NA

Calculated

Total amount of urea applied to soils: 1,000.00 t

State: draft

Add Update Cancel

Common data for all categories

Category-specific settings; they may appear once the common data are entered if the form is filled the first time

Data entry fields that appear after category-specific settings are entered/selected

Calculated by SAGE

Save the record and add it to the collection (for new records this will be the "ADD" button; for edited records – the "Save" button)

Figure 59. The list of records is updated

3.C.3 - List

Added record: #57

show 36 records, starting from #1 (total 4)

	Id	Time-series ADC	year	lpc	ext	tier	aggreg	land use	region	area, t	value type	submitted	state
	38	AG_TEST_2020-2023	2021	3.C.3		1	National	Grassland		50,000.00	NA	2024-03-16 08:35:11	draft
	39	AG_TEST_2020-2023	2021	3.C.3		2	National	Managed other land		50,000.00	NA	2024-03-16 08:35:38	draft
	45	AG_TEST_2020-2023	2023	3.C.3		3	National			500.00	NA	2024-03-20 11:46:15	draft
	57	AG_TEST_2020-2023	2023	3.C.3		2	National	Annual crops	Top region	1,000.00	NA	2024-04-01 23:35:35	draft

8.2.2.3 Direct N₂O emissions from managed soils (3.C.4)

The 3.C.4 category includes several subcategories that reflect different sources of nitrogen added to agricultural soils leading to direct N₂O emissions. The following subcategories are included:

- synthetic N fertilizers
- organic N applied as fertilizer (e.g., animal manure, compost, sewage sludge, rendering waste)
- urine and dung N deposited on pasture, range, and paddock by grazing animals
- N in crop residues (above-ground and below-ground)
- N mineralization associated with loss of soil organic matter resulting from change of land use or management of mineral soils
- Drainage of managed organic soils
- Rewetting of managed organic soils.

Each of these subcategories has a data entry form in SAGE.

Additionally, SAGE includes a special form of data entry that corresponds to the tab “Managed manure N available for application to managed soils, feed, fuel, or construction uses”.

Consistency of the data between categories

The following Activity data entry forms use a substantial amount of data already entered in 3.A.2 category:

- **Urine and dung N deposited on pasture, range, and paddock by grazing animals** (abbreviated reference is “Urine and dung”)
- **Managed manure N available for application to managed soils, feed, fuel, or construction uses** (abbreviated reference is “Managed manure”)

To **ensure consistency** of data entries between categories, use the following approach:

- Before data entry in 3.C.4: enter the data for 3.A.1 and 3.A.2 **BEFORE** making data entries in these data entry forms in 3.C.4.
- After data entry to 3.C.4: Use SAGE function **Validate** to check if:
 - In the **3.C.4 Managed manure** tab: 3.C.4 managed manure AD record is completed for all relevant 3.A.2 records (**Figure 60**).
 - In the **3.C.4 Urine and dung** tab: amount of N from manure available to application entered in **3.C.4 Urine and dung** subcategory matches the N amount entered in 3.A.2 category (**Figure 61**).
 - In the **3.C.4 Organic N** tab: Check that the fraction of total N from all MMS except Pasture/Range/Paddock applied to soils does not exceed 100% (**Figure 62**).

More specific details on ensuring consistency of data entries between categories are in the relevant subcategory sections in this chapter.

Figure 60. Use of Validate function to check consistency between category data entries for 3.C.4 Managed manure and the relevant 3.A.2 category



id	3.A.2 id	Time-series ADC	year	aggregation	climate	livestock type	MMS type	N(MMSavb), kg	complet
3	48	AG_TEST_2020...	2021	National	Boreal Moist	Mules and Ass...	Liquid/slurry	202,350.20	✓
1	5	AG_TEST_2020...	2022	Bottom region	Boreal Dry	Mature Swine	Solid storage	60,220.00	✓
100000000	46	AG_TEST_2020...	2020	Middle region	Cool Temperat...	Dairy Cow	Daily spread		✗
100000001	28	AG_TEST_2020...	2020	National	Warm Temper...	Sheep > Grow...	Aerobic treat...		✗
100000002	4	AG_TEST_2020...	2022	Bottom region	Boreal Dry	Mature Swine	Dry lot		✗
100000003	14	AG_TEST_2020...	2020	Bottom region	Cool Temperat...	Dairy Cow > ...	Daily spread		✗

The Complete column shows if the source record from the 3.A.2 category is used to produce a new record in 3.C.4 (Managed manure).

Figure 61. Use of Validate function to check consistency between category data entries between category data entries for 3.C.4 Urine and dung and the relevant 3.A.2 category

id 3a2	Time-series ADC	year	aggregation	climate	feed class	feed situation	livestock type	MMS type	N 3.A.2 kg	N 3.C.4 kg	3.C.4 records	complete
64	AG_TEST_202...	2020	National	Tropical Dry	Free-range	Pasture	Camels	Pasture/Rang...	364543.00	327908...	1	X
49	AG_TEST_202...	2020	National	Tropical Dry	Free-range	Pasture	Buffalo > Mat...	Pasture/Rang...	3224775...	187038...	1	X
29	AG_TEST_202...	2023	National	Cool Temper...	Pasture	Grazing large...	Other Cattle	Pasture/Rang...	25000.00	15000.00	1	X

Figure 62. Check fraction of total N from MMS does not exceed 100%

Time-series ADC	year	aggregation	region	land use	value type	N amount	N fraction	valid	state
AG_TEST_2020-2023	2020	National	all	all	MMS > Total > N applied	13881350	100	X	draft
AG_TEST_2020-2023	2020	National		all	MMS > Total > Region > N applied	13881350	100	X	draft
AG_TEST_2020-2023	2020	National		Cropland	MMS > Region > Land use > N applied	13881350	100	X	draft

Data entry steps

The process of data entries for 3.C.4 follows the same general steps as described for other agriculture categories:

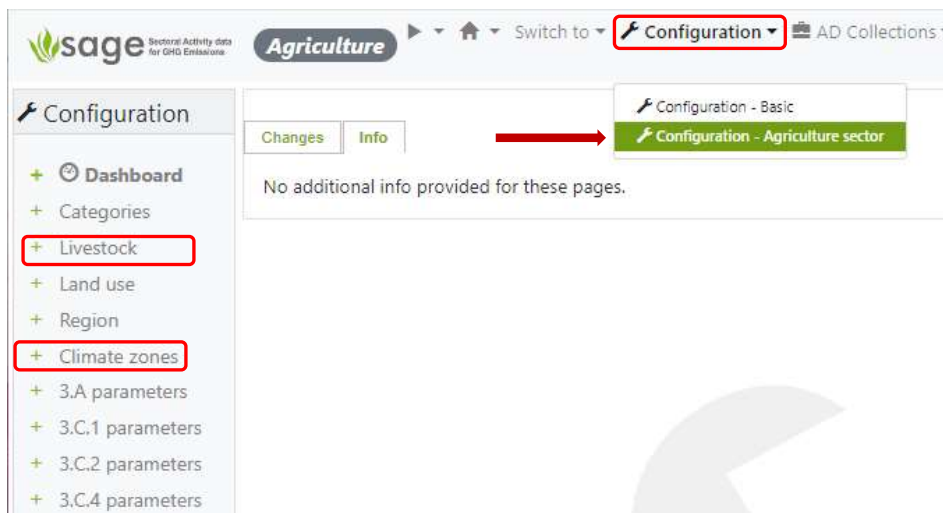
Step 1 for all subcategories of 3.C.4, the technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

Step 2 Differs for different subcategories of 3.C.4. Check and update (if needed) the following tables in the cross-category section of the configuration tables for the agriculture sector:

- for "Managed manure N available for application"
- Configuration – Agriculture sector > Table (Climate zone, Livestock) (Figure 63)

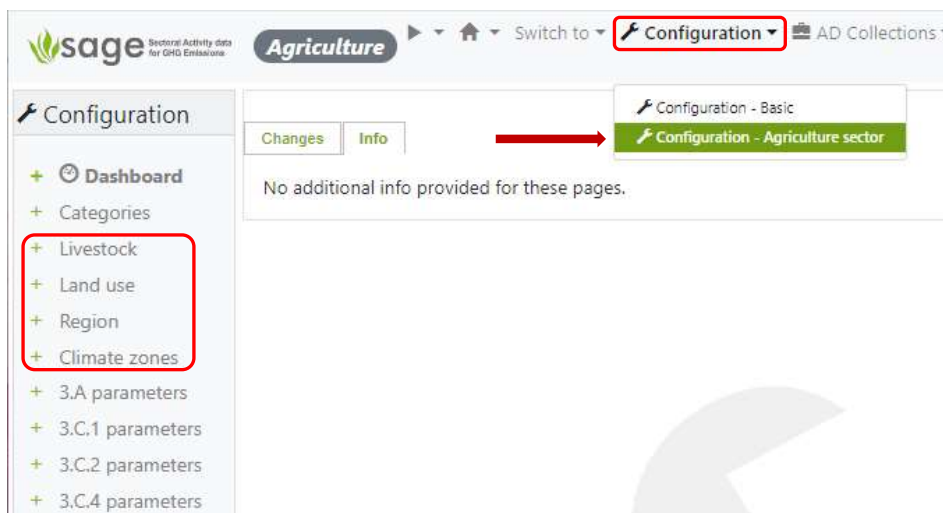
Figure 63. Configuration – Agriculture sector tables; Climate zone and Livestock table links are in the left red frames



- for “Urine and dung to managed soils”,

Configuration – Agriculture sector > Table (Climate zone, Region, Livestock, Land use) (Figure 64)

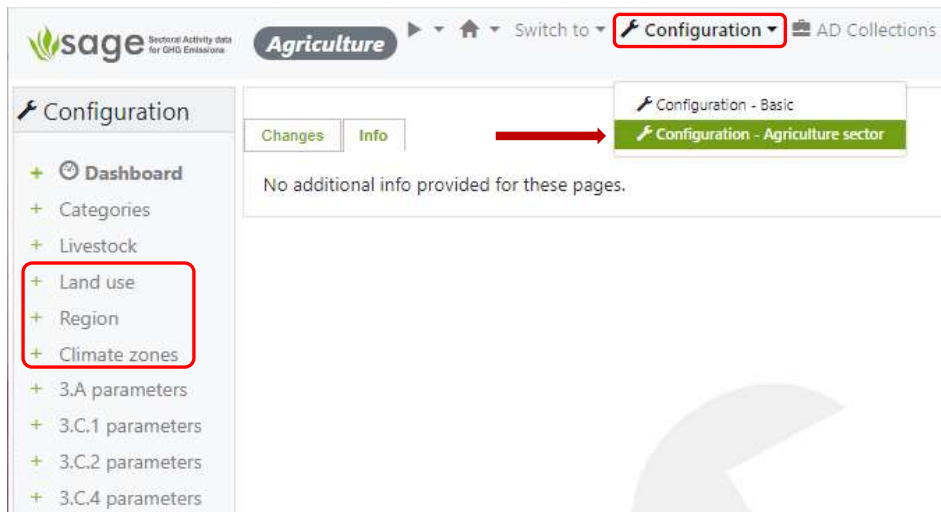
Figure 64. Configuration – Agriculture sector tables; Climate zone, Region, Land use, and Livestock table links are in the red frame



- for “Synthetic N applied to managed soils” and “Organic N fertilizers”,

Configuration – Agriculture sector > Table (Climate zone, Region, Land use) (Figure 65)

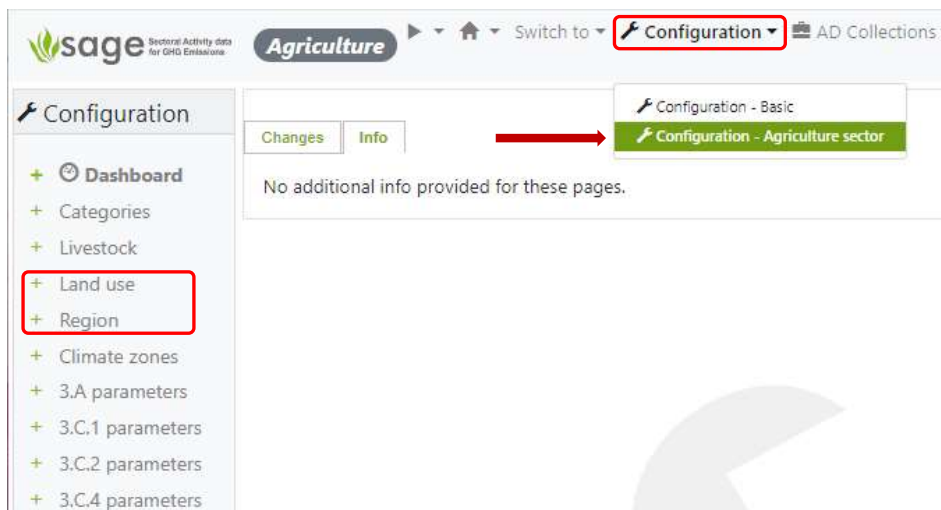
Figure 65. Configuration – Agriculture sector tables; Climate zone, Region, and Land use table links are in the red frame



- for “N in crop residuals”, “N in mineral soils”, “Drainage of organic soils”, and “Rewetting of organic soils”

Configuration – Agriculture sector > Table (Region, Land use) (Figure 66)

Figure 66. Configuration – Agriculture sector tables; Region, and Land use table links are in the red frame

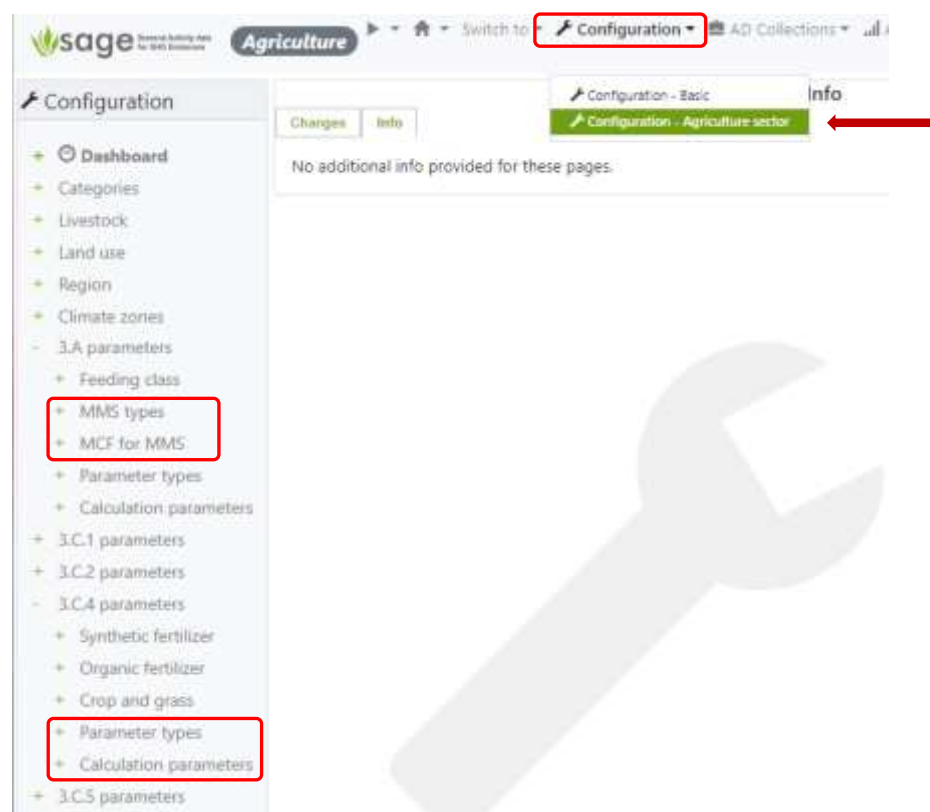


Step 3 for these subcategories requires checking and updating the calculated parameters in the agriculture category-specific section of the configuration tables:

- for “Managed manure N available for application” and “Urine and dung to managed soils”,

Configuration – Agriculture sector > 3.A> Table (MMS types) (Figure 67)

Figure 67. Configuration – Agriculture sector category-specific tables for 3.C.4; MMS types (3.A.2), and Calculated parameters (3.C.4) table links in the red frame



- for “Synthetic N applied to managed soils”,

Figure 68. Configuration – Agriculture Category Specific > 3.C.4 > Table (Synthetic fertilizer, Calculated parameters)

Synthetic fertilizer - List

	id	code	category	name	N content fraction	description	Basic	status
<input type="checkbox"/>	3	chloride	Ammonium-based	Ammonium chloride	0.2600		Any	enabled
<input type="checkbox"/>	101	ammo-nitr	Ammonium-nitrate-based	Ammonium nitrate	0.3400		✓	enabled
<input type="checkbox"/>	402	ammo-phos-sulf	Other (complex) fertilizers	Ammonium phosphate sulphate	0.1600	Ammonium phosphate sulphate (16-20-0)	✓	enabled
<input type="checkbox"/>	2	sulphate	Ammonium-based	Ammonium sulphate	0.2100		✓	enabled
<input type="checkbox"/>	1	anhydrous	Ammonium-based	Anhydrous ammonium	0.8200		✓	enabled
<input type="checkbox"/>	100	calc-ammo-nitr	Ammonium-nitrate-based	Calcium ammonium nitrate	0.2500		✓	enabled
<input type="checkbox"/>	200	calc-nitr	Nitrate-based	Calcium nitrate	0.1500		✓	enabled
<input type="checkbox"/>	401	diammo-phos	Other (complex) fertilizers	Diammonium phosphate	0.1800	Diammonium phosphate (DAP) (18-46-0)	✓	enabled
<input type="checkbox"/>	400	monoammon-phos	Other (complex) fertilizers	Monocammonium phosphate	0.1100	Monocammonium phosphate (MAP) (11-52-0)	✓	enabled
<input type="checkbox"/>	201	potas-nitr	Nitrate-based	Potassium nitrate	0.1300	Potassium nitrate (granular/prilled) (13-0-45)	✓	enabled
<input type="checkbox"/>	300	urea	Urea	Urea	0.4600		✓	enabled

- for “Organic N fertilizers”,

Figure 69. Configuration – Agriculture Category Specific > 3.C.4 > Table (Organic fertilizer, Calculated parameters)

	id	code	name	N content fraction	description	basic status	status
<input type="checkbox"/>	100	alpha	Alphalpa Meal		https://cdns.enrpub.com/doc/10.1135/qgs-2019-0056	enabled	Any
<input type="checkbox"/>	1	manure	Animal manure from MME (except FRP)			enabled	
<input type="checkbox"/>	101	bat-guano	Bat Guano		https://www.grow-it-organically.com/organic-nitrogen-fertilizer-h...	enabled	
<input type="checkbox"/>	102	blood-meal	Blood Meal		https://www.grow-it-organically.com/organic-nitrogen-fertilizer-h...	enabled	
<input type="checkbox"/>	103	blood-meal-raw	Bone meal, raw		https://www.uky.edu/hort/sites/www.uky.edu/hort/files/docume...	enabled	
<input type="checkbox"/>	104	blood-meal-steamed	Bone meal, steamed		https://www.uky.edu/hort/sites/www.uky.edu/hort/files/docume...	enabled	

- for “N in crop residuals”, “N in mineral soils”, “Drainage of organic soils”, and “Rewetting of organic soils”

Figure 70. Configuration – Agriculture sector > 3.C.4 > Table (Crop and grass, Calculated parameters)

	id	code	crop type	residue type	land use type	name	description	basic status	status
<input type="checkbox"/>	301	alfalfa	N-fixing forages	Below ground	Grassland	Alfalfa		enabled	
<input type="checkbox"/>	12	amaranth	Grains - Non-Cereals	Below ground	Cropland	Amaranth		enabled	
<input type="checkbox"/>	24	bean-bambara	Pulses	Below ground	Cropland	Bambara beans, dry		enabled	
<input type="checkbox"/>	40	bambara-nut	Root crops, other	Below ground	Cropland	Bambara nut		enabled	
<input type="checkbox"/>	46	banana	Other crops	Below ground	Cropland	Banana		enabled	
<input type="checkbox"/>	5	barley	Grains - Cereals	Below ground	Cropland	Barley		enabled	
<input type="checkbox"/>	16	bean-pulse	Pulses	Below ground	Cropland	Beans and Pulses (general)		enabled	
<input type="checkbox"/>	25	gram-black	Pulses	Below ground	Cropland	Black gram		enabled	
<input type="checkbox"/>	300	bread-grass	Other grass	Below ground	Grassland	Bread grass		enabled	
<input type="checkbox"/>	13	buckwheat	Grains - Non-Cereals	Below ground	Cropland	Buckwheat		enabled	
<input type="checkbox"/>	47	cabbage	Other crops	Below ground	Cropland	Cabbage		enabled	
<input type="checkbox"/>	14	canhua	Grains - Non-Cereals	Below ground	Cropland	Canhua		enabled	
<input type="checkbox"/>	48	cannabis	Other crops	Below ground	Cropland	Cannabis		enabled	
<input type="checkbox"/>	41	carrot	Root crops, other	Below ground	Cropland	Carrot		enabled	

Step 4 fill in the activity data entry forms in the AD Collection module in SAGE.

Due to dependencies between categories, selecting records for editing or adding records process in 3.C.4 includes additional actions.

Entering and editing 3.C.4 – Managed manure and 3.C.4 – Dung and urine records

In the List page, the List tables for both Managed manure and Dung and urine may include two types of records (**Figure 71**):

- Source records that have data copied from 3.A.2 and are available for further editing and entering parameters specific for 3.C.4 (they do not have a selection box at the beginning, just the edit sign)
- Records that have already used the source records from 3.A.2 and have parameters for 3.C.4 included. These records show both the selection box and the editing sign at the beginning.

Key features for this page:

- There is no ADD button, only List, Export, Changes, and Info above the list table. This is because users can enter the information in and edit only the records that have been already sourced from 3.A.2 category to maintain consistency of entries for common parameters.
- The State column of the List table has an amber-colored sign for the records that have the parameters from 3.A.2 category, but the parameters for the 3.C.4 categories are not entered yet.
- The source records usually have very large ID numbers to distinguish them from the already edited records.

Figure 71. List table for 3.C.4 – Managed manure with pre-defined source records from 3.A.2 category

id	id 3a2	Time-series ADC	year	ipcc	climate	livestock type	MMS type	average popul.	NEmms, kg	Fact(LossMS), %	N(beddingMS), kg	N(MMSarb), kg	submitted	state
10000000	4	AG_TEST...	2022	3.C.4	Boreal Dry	Mature ...	Dry lot	5,000	20,440.00					draft
10000000	46	AG_TEST...	2020	3.C.4	Cool Te...	Dairy Cow	Daily spr...	1,000,000	22,000.00					draft
10000000	28	AG_TEST...	2020	3.C.4	Warm Te...	Sheep >...	Aerobic	2,466	29,486.95					draft
10000000	14	AG_TEST...	2020	3.C.4	Cool Te...	Dairy Co...	Daily spr...	8,000	514,630...					draft
1	5	AG_TEST...	2022	3.C.4	Boreal Dry	Mature ...	Solid sto...	5,000	20,440.00	50	10.00	60,220.00	2024-01-10 ...	draft
3	48	AG_TEST...	2021	3.C.4	Boreal	Mules a...	Liquid/dl...	5,200	113,500...	50	28.00	202,350.20	2024-03-27 ...	draft

To **edit** the existing record, click on one of the records that have BOTH the selection box AND the edit sign at the beginning in the List table. These records have a “draft” value in column “State” in the list table.

To **add a new record** to 3.C.4, click on one of the records that have ONLY an edit sign and no selection box at the beginning and an amber sign in the “State” column of the List table.

Filling the AD entry forms: Managed manure and Urine and dung

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 72**). For example,

- 3.C.4 > Managed manure N available for application to managed soils, feed, fuel, or construction uses
- 3.C.4 > Urine and dung deposited by grazing animals

Figure 72. Category selection in SAGE

3.C.4 - Dung and urine - Record #100000000

Annual AD collection:
AG_TEST_2020-2023_2022

Category:
3.C.4 > Urine and Dung Deposited by Grazing Animals

Category-specific fields additional to those described in section 8.1.3 include:

- Data collection period (months) (default is on the annual basis = 12 months)
- Climate zone (select specific climate zone most applicable to your country or make regional entries)
- Livestock type (contains livestock subdivisions available for the selected category)
- Manure management system type (select from available options)
-
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - Fraction of manure N lost in the MMS – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.
 - N in organic bedding (kg N/animal/y) – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:


- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 73**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 73**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 74**).

Figure 73. Entering the data in category group 3.C.4 Urine and dung



AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- + **Annual AD (4)**
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)
- + Publish (0)

3.C.4 - Dung and urine - Record #7

List Export Changes Info **Record #7** 3.A 3.C

Annual AD collection:
AG_TEST_2020-2023_2022

Category:
3.C.4 > Urine and Dung Deposited by Grazing Animals

Aggregation/Geographical zone:
Top region

Statistics quality:
Unknown

Tier:
T2

Data collection period (months):
12

Climate zone:
Boreal Moist

Livestock type:
Poultry > Turkeys > Free range

Manure management system type:
Pasture/Range/Paddock

3.A.2 N source:
T1, ipcc: 3.A.2.i - Livestock > Manure Management > Poultry

Region:
Unspecified

Land use type:
Grassland > Managed

Calculate N excretion for dung and urine separately:
☒

Dung fraction in N source: 0.20 fraction : application default > modeled **Set from default**

Fraction of livestock category manure deposited on PRP: 0.60 fraction : manual entry > NA

Uncertainty details **Set from default**:

Dung fraction in N source uncertainty: 20.00 % : application default > NA

N source fraction deposited within region/land-use uncertainty: 20.00 % : application default > NA

Calculated

Annual N excretion (kg N/y), from parent 3.A.2 record: 472.2

Amount of N from N source deposited on Pasture/Range/Paddock, kg N/y: 283.31 kg

State:
draft

Save Delete Update Cancel

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Common data for all categories

Category-specific settings

Data entry fields

Calculated by SAGE

Figure 74. The list of records is updated

3.C.4 - Dung and urine - List

List Export Changes Info 3.A 3.C

Record (rec_id=7) has been saved

show 30 records, starting from # 1 (total 6) Search Clear Delete selected Update selected

	id	id 3a2	Time-series ADC	year	ipcc	ext	tier	aggreg.	climate	livestock type	MMS type	region	land use	NErms, kg	separate D/U	dung fract.	LU fract.	N(MMSwb), kg	submitted	state
<input type="checkbox"/>	6	65	AG_TEST_2...	2020	3.C.4	uri-dung	2	National	Boreal Dry	Horses	Pasture/Ra...		Unmanaged	399,602.00	Y	0.20	0.90	359,641.80	2024-04-12	draft
<input type="checkbox"/>	3	30	AG_TEST_2...	2020	3.C.4	uri-dung	1	National	Cool Temp...	Dairy Covi	Pasture/Ra...		Grassland	85,775,000...	Y	0.36	1.00	85,775,000.00	2024-03-12	draft
<input type="checkbox"/>	7	3	AG_TEST_2...	2022	3.C.4	uri-dung	2	Top region	Boreal Moist	Poultry > T...	Pasture/Ra...		Managed	472.18	Y	0.20	0.60	283.31	2024-04-13	draft
<input type="checkbox"/>	4	48	AG_TEST_2...	2020	3.C.4	uri-dung	1	National	Tropical Dry	Buffalo > ...	Pasture/Ra...		Cropland	32,347,750...	Y	0.80	0.58	18,703,895.00	2024-03-27	draft
<input type="checkbox"/>	2	29	AG_TEST_2...	2023	3.C.4	uri-dung	2	National	Cool Temp...	Other Cattle	Pasture/Ra...		Grassland	25,000.00	Y	0.36	0.60	15,000.00	2024-01-19	draft
<input type="checkbox"/>	5	64	AG_TEST_2...	2020	3.C.4	uri-dung	2	National	Tropical Dry	Camels	Pasture/Ra...		Grassland	364,343.00	Y	0.48	0.90	327,908.70	2024-04-10	draft

Entering and editing 3.C.4 – Synthetic N fertilizer and 3.C.4 – Organic N records

- These two subcategories do not have dependency on 3.A category entries, so their List table shows only one type of records. For each synthetic fertilizer and each organic amendment added to soils, a separate entry form should be filled.

To **edit** the existing record, click on the edit sign at the beginning in the List table. These records have a “draft” value in column “State” in the list table.

To **add a new record** to 3.C.4, click the button ADD.

Filling the AD entry forms: Synthetic N fertilizer and Organic N records

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 75**). For example,

- 3.C.4 > Synthetic N fertilizer
- 3.C.4 > Organic N fertilizer

Figure 75. Category selection in SAGE

sage Sectoral Activity data for GHG Emissions **Agriculture** Switch to Configuration AD Collections

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- + **Annual AD (4)**
- + Manage all
- + Draft (4)

3.C.4 - Synthetic N - Add

List Add Export Import Changes Info Record #44 3.A 3.C

• Total N applied (kg): 46
 • Operation completed

ID:

Annual AD collection:
AG_TEST_2020-2023_2022

Category:
3.C.4 > Inorganic N Fertilizers
3.C.4 > Inorganic N Fertilizers

Category-specific fields additional to those described in section 8.1.3 include:

- Land-use type

- Synthetic fertilizer type
-
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - N applied (mass/year):
 - this value could be **calculated**:
 - tick the “calculate N amount” box
 - enter the value in the “Fertilizer apply amount” field (the “N fraction in fertilizer” value will be set automatically for the specified fertilizer).
 - click the button “calculate” – the calculated amount of N will appear in the “N applied” field underneath, OR
 - The amount of N could be **entered without calculation** (leave the “calculate N amount” box unticked) and enter the value in the “N applied” field.
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values based on the entered data and the data available from the configuration tables

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 76**)


Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 76**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 77**).

For the Organic N subcategory, the entry steps are very similar, but instead of the Synthetic fertilizer, the Organic amendment details are needed.

Figure 76. Entering the data in category group 3.C.4 Synthetic N fertilizer

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- +  Annual AD (4)**
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)
- + Publish (0)

3.C.4 - Synthetic N - Add

List
Add
Export
Import
Changes
Info
Record #44

- Total N applied (kg): 46
- Operation completed

ID: 3.A ▾ 3.C ▾

Annual AD collection:

AG_TEST_2020-2023_2022 ▾

Category:

3.C.4 > Inorganic N Fertilizers ▾

Aggregation:

National ▾

Statistics quality:

Well developed ▾

Tier:

T2 ▾

Region:

Unspecified ▾

Land use type:

Cropland > Annual crops > Corn (custom) ▾

Synthetic fertilizer type:

Urea ▾

Calculate N amount:

☒

Calculate N applied with values: ▾

N applied (mass/year) : 46.00 kg : *calculated* ▾

Uncertainty details Set from default ? :

N applied uncertainty : 20.00 % : *application default > NA* ▾

Calculated

Total amount of N applied to soils: 46.00 kg ?

State:

draft ▾

Add
Update
Cancel

↑

Common data for all categories

←

Category-specific settings

←

Data entry fields

←

Calculated by SAGE

←

↑

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Figure 77. The list of records is updated


3.C.4 - Synthetic N - List

Added record: #69

show 36 records, starting from #1 (total 2) [Search](#) [Clear](#) [Delete selected](#)

	id	Time-series ADC	year	ipcc	ext	tier	agg.	region	land use	synthetic fertilizer	calculated	fertilizer amount, kg	N fraction	N applied, kg	value type	submitted	state
<input type="checkbox"/>	44	AG_TEST_...	2021	3.C.4	inorg	1	National			Urea > Ur...	Y	500.00	0.46	230.00	calculated	2024-03-24 ...	draft
<input type="checkbox"/>	45	AG_TEST_...	2021	3.C.4	inorg	1	National			Ammoniu...	Y	500.00	0.21	105.00	calculated	2024-03-24 ...	draft
<input type="checkbox"/>	69	AG_TEST_...	2022	3.C.4	inorg	2	National		Corn	Urea > Ur...	Y	100.00	0.46	46.00	calculated	2024-04-13 ...	draft

Figure 78. Entering and editing 3.C.4 – N in crop residues records

 Agriculture

Configuration

Crop and grass - Add

not set (new record)

Crop type: **Grains - Non-Cereals**

Residue type: **Above ground**

Code:

Name:

Description:

This record is basic/default: **No**

Status: **enabled**

[Add](#) [Cancel](#)

- These two subcategories do not have a dependency on 3.A category entries, so their List table shows only one type of record. For each synthetic fertilizer and each organic amendment added to soils, a separate entry form should be filled.

To **edit** the existing record, click on the edit sign at the beginning of the List table. These records have a “draft” value in column “State” in the list table.

To **add a new record** to 3.C.4, click the button ADD.

Filling the AD entry forms: N in crop residues records

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 79**). For example,

- 3.C.4 > Synthetic N fertilizer
- 3.C.4 > Organic N fertilizer

Figure 79. Category selection in SAGE



Category-specific fields additional to those described in section 8.1.3 include:

- Land-use type
- Synthetic fertilizer type
-
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - N applied (mass/year):
 - this value could be **calculated**:
 - tick the “calculate N amount” box
 - enter the value in the “Fertilizer apply amount” field (the “N fraction in fertilizer” value will be set automatically for the specified fertilizer).
 - click the button “calculate” – the calculated amount of N will appear in the “N applied” field underneath, OR
 - The amount of N could be **entered without calculation** (leave the “calculate N amount” box unticked) and enter the value in the “N applied” field.
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values based on the entered data and the data available from the configuration tables

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 110**)


Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 110**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 80**).

For the Organic N subcategory, the entry steps are very similar, but instead of the Synthetic fertilizer, the Organic amendment details are needed.

Figure 80. Entering the data in category group 3.C.4 Synthetic N fertilizer

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- +  Annual AD (4)**
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)
- + Publish (0)

3.C.4 - Synthetic N - Add

List
Add
Export
Import
Changes
Info
Record #44

- Total N applied (kg): 46
- Operation completed

ID: 3.A ▾ 3.C ▾

Annual AD collection:

AG_TEST_2020-2023_2022 ▾

Category:

3.C.4 > Inorganic N Fertilizers ▾

Aggregation:

National ▾

Statistics quality:

Well developed ▾

Tier:

T2 ▾

Region:

Unspecified ▾

Land use type:

Cropland > Annual crops > Corn (custom) ▾

Synthetic fertilizer type:

Urea ▾

Calculate N amount:

☒

Calculate N applied with values: ▾

N applied (mass/year) : 46.00 kg : *calculated* ▾

Uncertainty details Set from default ? :

N applied uncertainty : 20.00 % : *application default > NA* ▾

Calculated

Total amount of N applied to soils: 46.00 kg ?

State:

draft ▾

Add
Update
Cancel

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Figure 81. The list of records is updated

3.C.4 - Synthetic N - List

List Add Export Import Changes Info Record #44 3.A 3.C

Added record: #69

show 36 records, starting from #1 filter Search Clear Add Delete selected

	id	Time-series ADC	year	ipcc	ext	tier	aggreg.	region	land use	synthetic fertilizer	calculated	fertilizer amount, kg	N fraction	N applied, kg	value type	submitted	state
<input type="checkbox"/>	44	AG_TEST_...	2021	3.C.4	inorg	1	National			Urea > Ur...	Y	500.00	0.46	230.00	calculated	2024-03-24 ...	draft
<input type="checkbox"/>	45	AG_TEST_...	2021	3.C.4	inorg	1	National			Ammonia...	Y	500.00	0.21	105.00	calculated	2024-03-24 ...	draft
<input type="checkbox"/>	69	AG_TEST_...	2022	3.C.4	inorg	2	National		Corn	Urea > Ur...	Y	100.00	0.46	46.00	calculated	2024-04-13 ...	draft

Entering and editing 3.C.4 – N in mineral soils (that is mineralized) and N in crop residues

- These subcategories do not have a dependency on 3.A category entry, so their List table shows only one type of record. Please keep the Land use type and the land uses consistent with what you are reporting for the LULUCF sector.

To **edit** the existing record, click on the edit sign at the beginning of the List table. These records have a “draft” value in column “State” in the list table.

To **add a new record** to 3.C.4, click the button ADD.

Filling the AD entry forms: N in mineral soils (that is mineralized) records

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 82**). For example,

- 3.C.4 > N in mineral soils (that is mineralized)
- 3.C.4 > N in crop residues

Figure 82. Category selection in SAGE (example for N in mineral soils that is mineralized)

3.C.4 - N in mineral soils - Add

List Add Export Import Changes Info 3.A 3.C

ID:

Annual AD collection:

Select

Category:

3.C.4 > N in mineral soils that is mineralized

3.C.4 > N in mineral soils that is mineralized

National

Statistics quality:

3.C.4 - mineral > N in mineral soils that is mineralized :: Direct N2O Emissions from Mineralization/immobilization associated with loss/gain of soil organic matter

Category-specific fields additional to those described in section 8.1.3 include:

- 3.C.4 > N in mineral soils (that is mineralized)
 - Region
 - Land unit code (if known)
 - Initial Land-use type
 - Initial crop or grass
 - Current land use type
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- C:N ratio of organic matter– includes the “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.
- Average loss of soil carbon (mass C/year)
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.
- 3.C.4 > N in crop residues
 - Region
 - Land unit code (if known)
 - Initial Land-use type
 - Crop or grass associated with the selected land use type
 - Calculation method (two options are available):
 - main method (equation 11.6, p. 14, Ch. 11, Vol. 4, 2006 IPCC GLs)
 - alternative method (equation 11.7a, p. 15, Ch. 11, Vol. 4, 2006 IPCC GLs)
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - Calculate harvested annual dry matter yield for crop (needed for the alternative method)
 - Harvested annual dry matter yield (specified)
 - Annual harvest area
 - Annual burnt area
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath the category parameter entry block, there are two sections on this page:

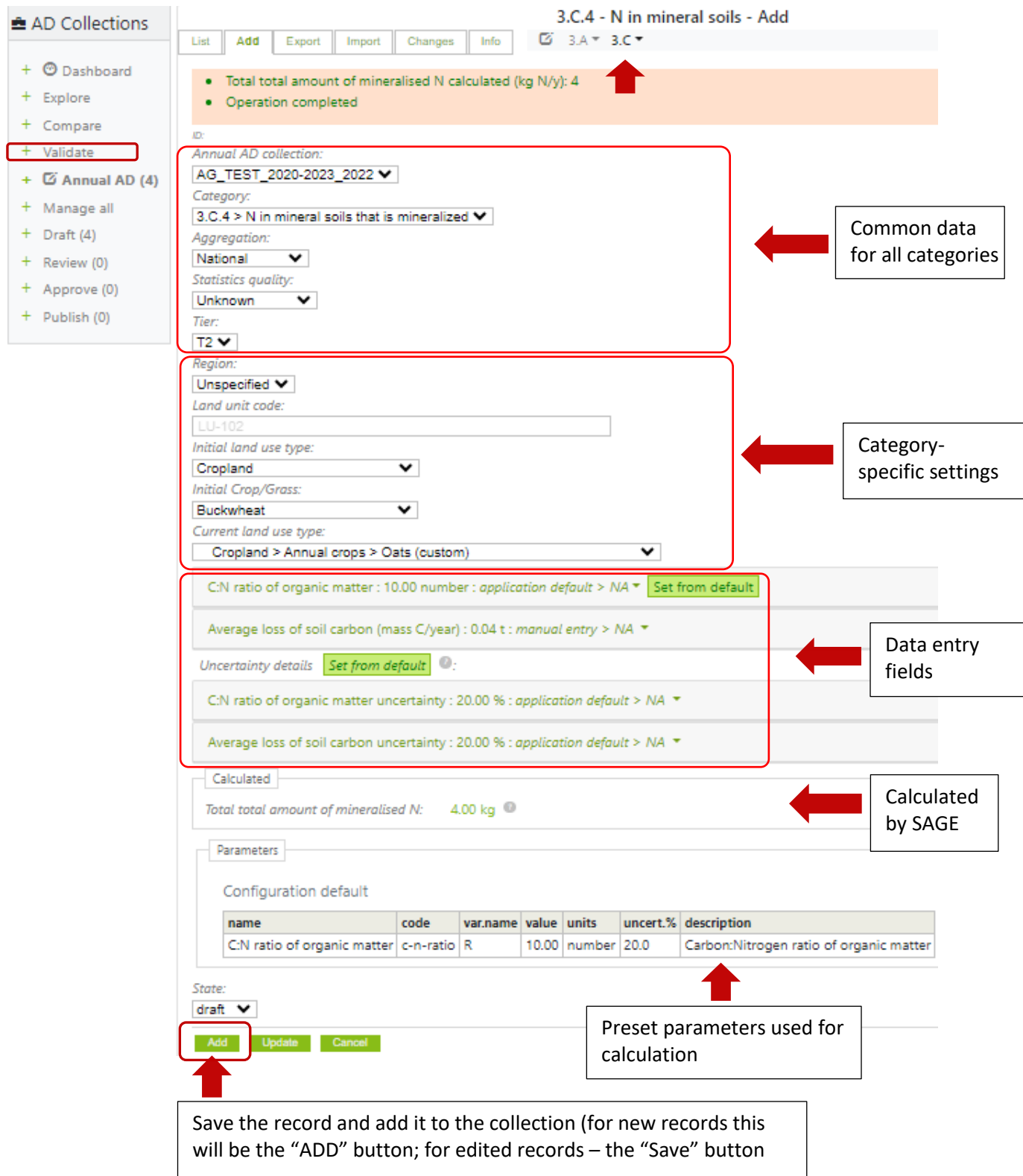
- “calculated” to show calculated values based on the entered data and the data available from the configuration tables
- “parameters” showing the list of parameters from configuration tables used for the calculations

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 83**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 83**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 84**).

Figure 83. Entering the data in category group 3.C.4 N in mineral soils that are mineralized



AD Collections

- + Dashboard
- + Explore
- + Compare
- + **Validate**
- + Annual AD (4)
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)
- + Publish (0)

3.C.4 - N in mineral soils - Add

List Add Export Import Changes Info 3.A 3.C

- Total total amount of mineralised N calculated (kg N/y): 4
- Operation completed

ID:

Annual AD collection: AG_TEST_2020-2023_2022

Category: 3.C.4 > N in mineral soils that is mineralized

Aggregation: National

Statistics quality: Unknown

Tier: T2

Region: Unspecified

Land unit code: LU-102

Initial land use type: Cropland

Initial Crop/Grass: Buckwheat

Current land use type: Cropland > Annual crops > Oats (custom)

C:N ratio of organic matter : 10.00 number : application default > NA Set from default

Average loss of soil carbon (mass C/year) : 0.04 t : manual entry > NA

Uncertainty details Set from default:

C:N ratio of organic matter uncertainty : 20.00 % : application default > NA

Average loss of soil carbon uncertainty : 20.00 % : application default > NA

Calculated

Total total amount of mineralised N: 4.00 kg

Parameters

Configuration default

name	code	var.name	value	units	uncert.%	description
C:N ratio of organic matter	c-n-ratio	R	10.00	number	20.0	Carbon:Nitrogen ratio of organic matter

State: draft

Add Update Cancel

Save the record and add it to the collection (for new records this will be the "ADD" button; for edited records – the "Save" button)

Common data for all categories

Category-specific settings

Data entry fields

Calculated by SAGE

Preset parameters used for calculation

Figure 84. The list of records is updated

3.C.4 - N in mineral soils - List

List Add Export Import Changes Info 3.A - 3.C

Added record: #70

show 30 records starting from # 1 (total 3) Search Clear Add Delete selected

	id	Time-series ADC	year	ipcc t	ext	tier	aggreg.	land unit code	region	Initial land use	init. Crop/Grass	current land use	C:N ratio	carbon loss	N mineralised, kg	value type	submitted	state
<input type="checkbox"/>	51	AG_TEST...	2023	3.C.4	mineral	1	National	LU-123		Rice eco...	Rice	all rice cr...	10.00	25.00 t	2,500.00	NA	2024-03-27 ...	draft
<input type="checkbox"/>	70	AG_TEST...	2022	3.C.4	mineral	1	National	ALL		Cropland	Buckwheat	Oats	10.00	0.04 t	4.00	NA	2024-04-13 ...	draft

Entering and editing 3.C.4 – Drainage of organic soils and Rewetting of organic soils

- This subcategory does not have a dependency on 3.A category entry, so their List table shows only one type of record. Please keep the Land use type and the land uses consistent with what you are reporting for the LULUCF sector.

To **edit** the existing record, click on the edit sign at the beginning of the List table. These records have a “draft” value in column “State” in the list table.

To **add a new record** to 3.C.4, click the button ADD.

Filling the AD entry forms: Drainage of managed organic soils and Rewetting of managed organic soils

The AD entry forms for these subcategories are very similar.

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 85**). For example,

- 3.C.4 > Drainage of (managed) organic soils
- 3.C.4 > Rewetting of (managed) organic soils

Figure 85. Category selection in SAGE

3.C.4 - Drainage of organic soils - Add

List Add Export Import Changes Info 3.A - 3.C

ID:

Annual AD collection:

Select

Category:

3.C.4 > Drainage of managed organic soils

3.C.4 > Drainage of managed organic soils

National

3.C.4 - drainage > Drainage of managed organic soils :: Direct N2O Emissions From Managed Soils > Drainage of managed organic soils

Category-specific fields additional to those described in section 8.1.3 include:

- Region
- Land unit code (if known)
- Initial Land-use type
- Initial crop or grass
- Current land use type

- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - Land area of drained organic soils
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values, the net based on the entered data and the data available from the configuration tables

Click “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” or the “Save” button to save your record and add it to the collection (**Figure 86**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for the review, change the state to “ready” (**Figure 86**).

When the “Add” button is pressed, SAGE displays the list of all records for the category (**Figure 110**).

For Rewetting of managed organic soils subcategory, the entry steps are very similar, but instead of the Land area of drained organic soils, the Land area of rewetted organic soils is needed.

Figure 86. Entering the data in category group 3.C.4 Drainage of managed organic soils

3.C.4 - Drainage of organic soils - Record #71

List **Add** Export Import Changes Info Record #71 3.A 3.C

ID: 71

Annual AD collection:
AG_TEST_2020-2023_2022

Category:
3.C.4 > Drainage of managed organic soils

Aggregation:
National

Statistics quality:
Well developed

Tier:
T2

Region:
Unspecified

Land unit code:
LU-35

Initial land use type:
Cropland

Initial Crop/Grass:
Barley

Current land use type:
Cropland > Annual crops > Alfalfa (custom)

Land area of drained organic soils : 1,000.00 ha : manual entry > NA

Uncertainty details **Set from default** ?

Land area of drained organic soils uncertainty : 20.00 % : application default > NA

Calculated

Land area of drained organic soils: 1,000.00 ha

State:
draft

Save Delete Update Cancel

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Common data for all categories

Category-specific settings

Data entry fields

Calculated by SAGE

Figure 87. The list of records is updated

3.C.4 - Drainage of organic soils - List

3.A - 3.C

show: 30 records, starting from # 1 (total 2) Search Clear Delete selected

	id	Time-series ADC	year	ipcc 1	ext	tier	aggreg.	land unit code	region	initial land use	init. Crop/Grass	current land use	drained area, ha	value type	submitted	state
	52	AG_TEST_...	2021	3.C.4	drainage	1	National	LU-123		Rice ecos...	Rice	Rice Culti...	564.00	NA	2024-03-27 ...	draft
	71	AG_TEST_...	2022	3.C.4	drainage	2	National	LU-35		Cropland	Barley	Alfalfa	1,000.00	NA	2024-04-14 ...	draft

8.2.2.4 Indirect N₂O emissions from managed soils (3.C.5)

The 3.C.5 category includes two subcategories that reflect different sources of nitrogen added to agricultural soils leading to indirect N₂O emissions. The following subcategories are included:

- N₂O from Atmospheric deposition of N Volatilized from managed soils (Atmospheric deposition)
- N₂O from N leaching/ runoff from managed soils

All parameters required by the IPCC for the Atmospheric deposition subcategory have been already entered through the relevant subcategories of 3.C.4. The parameter Frac(GASM) is set in the configuration layer of SAGE. That is why SAGE does not offer a separate AD entry form for this subcategory.

SAGE provides data entry forms for 3.C.5 N Leaching/runoff subcategory for Fos only because all other parameters were entered in category 3.C.4 (see the details in step 4 description – AD entry form below). It then applies FracLEACH-(H) coefficient to estimate the amount of N that can be lost through leaching /runoff from the total N from Fos.

Consistency of the data between categories

The Activity data entry forms for 3.C.5 use the same land use categories and subdivisions as category 3.C.4 with the same characteristics of those lands. That is why some parameters in these subcategories inherited from the category 3.C.4 (Fon, Fprp, Fsn, Fprp, Fcr, and Fsom).

The data entries for 3.C.4 category for a particular land use and land use subdivision should be complete before entering the data to 3.C.5 for this land use and land use subdivision.

Data entry steps

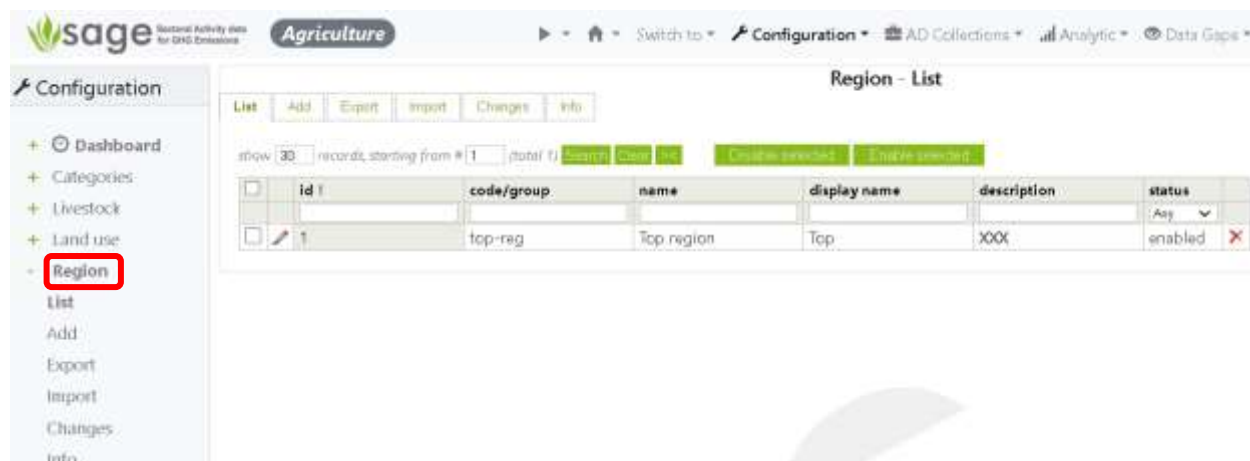
Step 1 for these categories is the same as for subcategories of category 3.A. The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Configuration – Agriculture sector > Table (Regions, Land use) (Figure 88)

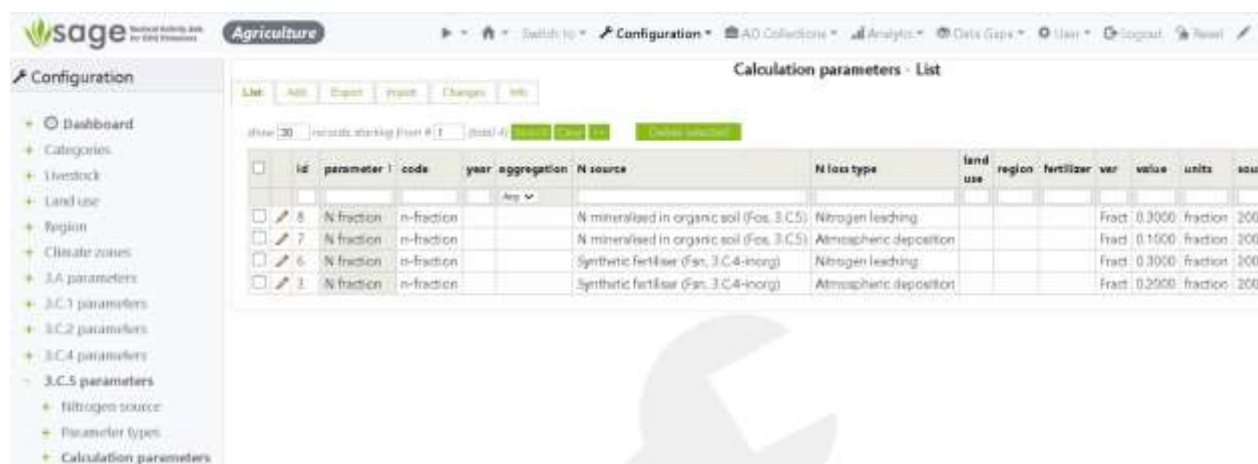
Figure 88. Configuration – Agriculture sector tables; Regions table link in the red frame



Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.5 section in the agriculture category-specific section of the configuration tables:

Configuration – Agriculture sector > 3.C.5 > Tables (Calculated parameters) (Figure 89)

Figure 89. Configuration – Agriculture category-specific 3.C.5



Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

Entering and editing 3.C.5 – Indirect N₂O emissions from managed soils records

3.C.5 List page shows all records available for editing and the records that have already been entered in 3.C.4 with indication whether the record in 3.C.4 is the source of parameters for Atmospheric deposition or Nitrogen leaching/runoff. If a record may contribute to both atmospheric deposition and N leaching /runoff, it is presented twice in the table – once for each N loss type. The records copied from 3.C.4 do are provided as a reference – they are not editable.

To **edit** the existing record, click on one of the records that have BOTH the selection box AND the edit sign at the beginning in the List table.

To **add a new record** to 3.C.5, click the “Add” button above the List table (Figure 90).

Figure 90. List table for 3.C.5.

Adding a new record Editable records Non-editable records

id	Time series	year	ipcc	ext	tier	aggreg.	N loss type	N source	region	land use	fertilizer	Amount of N applied, kg	Fraction of N lost	Amount of N lost, kg	submitted	state
17	AG_TEST_...	2020	3.C.5		1	National	Nitrogen leaching	N mineral...		Grassland		1,000.00	0.22	220.00	2024-04-12	draft
18	AG_TEST_...	2020	3.C.5		1	National	Nitrogen leaching	N mineral...		Annual cr...		1,000.00	0.22	220.00	2024-04-12	draft
19	AG_TEST_...	2022	3.C.5		1	National	Nitrogen leaching	N mineral...		Africa		1,000.00	0.22	220.00	2024-04-14	draft
11	AG_TEST_...	2020	3.C.5		1	National	Nitrogen leaching	N mineral...	Top region			44,595.20	0.22	9,810.94	2024-04-10	draft
15	AG_TEST_...	2020	3.C.5		1	National	Nitrogen leaching	N mineral...		Urban manag...		10,000.00	0.22	2,200.00	2024-04-13	draft
49	AG_TEST_...	2022	3.C.4	inorg	2	National	Atmospheric depo...	Synthetic ...		Corn	Urea	46.00	0.20	9.20	2024-04-13	draft
45	AG_TEST_...	2021	3.C.4	inorg	2	National	Nitrogen leaching	Synthetic ...			Ammoniu...	105.00	0.30	31.50	2024-03-24	draft
2	AG_TEST_...	2023	3.C.4	un-dung	2	National	Atmospheric depo...	Animal de...		Grassland		15,000.00			2024-01-19	draft
30	AG_TEST_...	2022	3.C.4	org	1	National	Nitrogen leaching	Organic f...		Cropland		13,881.35...			2024-03-27	draft
7	AG_TEST_...	2022	3.C.4	un-dung	2	Top region	Nitrogen leaching	Animal de...		Managed		283.31			2024-04-13	draft
68	AG_TEST_...	2020	3.C.4	crop-res	2	National	Nitrogen leaching	Crop resi...		Cropland		139,266.5...			2024-04-13	draft
4	AG_TEST_...	2020	3.C.4	un-dung	1	National	Nitrogen leaching	Animal de...		Cropland		18,703.69			2024-03-27	draft

Filing the AD form for 3.C.5

Selection of the category in SAGE follows the IPCC approach and includes a combination of the processes leading to GHG emissions (**Figure 91**). For example,

- 3.C.5 > Indirect N2O emissions from managed soils

Figure 91. Category selection in SAGE

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- + **Annual AD (4)**
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)

3.C.5 - Record #11

List Add Export Import Changes Info Record #67 Record #11 3.A 3.C

- Nitrogen source amount (kg): 44595.2
- Total of N contributing to N2O emissions (kg):
- Form entry details updated

ID: 11

Annual AD collection: AG_TEST_2020-2023_2020

Category: 3.C.5 > Indirect N2O Emissions From Managed Soils

National

3.C.5 > Indirect N2O Emissions From Managed Soils

Category-specific fields additional to those described in section 8.1.3 include:

- o Region (selection of regions is predefined by entries to the 3.C.4 category)
- o N loss type (= Nitrogen leaching, as explained above)
- o N source (= N mineralized in organic soils, because only Fos parameter needs entering)
- o Land use type (the provided option selection is consistent with 3.C.4 records)

Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- o Nitrogen source amount
- o Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values based on the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Save” button to save your record and add it to the collection (**Figure 92**)


Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 92**). If a higher tier is selected, the principal structure of the form will not change, but it is expected that the activity data are further disaggregated by regions.

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 93**).

Figure 92. Entering the data in category group 3.C.5

3.C.5 - Record #11

[List](#) [Add](#) [Export](#) [Import](#) [Changes](#) [Info](#) [Record #67](#) [Record #11](#) [Record #72](#)

 3.A ▾ 3.C ▾

ID: 11

Annual AD collection:

AG_TEST_2020-2023_2020 ▾

Category:

3.C.5 > Indirect N2O Emissions From Managed Soils ▾

Aggregation:

National ▾

Statistics quality:

Unknown ▾

Tier:

T1 ▾

Region:

Unspecified ▾

Data collection period (months):

12

N loss type:

Nitrogen leaching ▾

N source ⓘ:

N mineralised in organic soil (Fos, 3.C.5) ▾

Land use type:

Unspecified ▾

Nitrogen source amount : 44,595.20 kg : manual entry > NA ▾

Uncertainty details Set from default ⓘ:

Nitrogen source amount uncertainty : 20.00 % : application default > NA ▾

Calculated

Total nitrogen source amount: 44,595.20 kg ⓘ

Calculated amount of N contributing to N2O emissions: 9,810.94 kg ⓘ

Parameters

Configuration default

name	code	var.name	value	units	uncert.%	description
N fraction	n-fraction	Fract	0.30	fraction	0.0	Fraction of N in the source contributing to N2O emission

State:

draft ▾

Save
Delete
Update
Cancel

Save the record and add it to the collection (for new records this will be the "ADD" button; for edited records – the "Save" button)

Common data for all categories

Category-specific settings; they may appear once the common data are entered if the form is filled the first time

Data entry fields that appear after category-specific settings are entered/selected

Calculated by SAGE

Figure 93. The list of records is updated

id	Time-series ADC	year	ipcc	ext	tier	aggreg.	N loss type	N source
11	AG_TEST_2020-2023	2020	3.C.5		1	National	Nitrogen leaching	N mineralised in organic soil (Fos, 3.C.5)
72	AG_TEST_2020-2023	2020	3.C.5		1	National	Nitrogen leaching	N mineralised in organic soil (Fos, 3.C.5)
15	AG_TEST_2020-2023	2020	3.C.5		1	National	Nitrogen leaching	N mineralised in organic soil (Fos, 3.C.5)
67	AG_TEST_2020-2023	2020	3.C.5		1	National	Nitrogen leaching	N mineralised in organic soil (Fos, 3.C.5)
2	AG_TEST_2020-2023	2020	3.C.5		1	National	Nitrogen leaching	N mineralised in organic soil (Fos, 3.C.5)
69	AG_TEST_2020-2023	2022	3.C.4	inorg	2	National	Atmospheric deposition	Synthetic fertiliser (Fsn, 3.C.4-inorg)
44	AG_TEST_2020-2023	2021	3.C.4	inorg	1	National	Atmospheric deposition	Synthetic fertiliser (Fsn, 3.C.4-inorg)
50	AG_TEST_2020-2023	2020	3.C.4	org	1	National	Atmospheric deposition	Organic fertiliser (Fon, 3.C.4-org)

8.2.2.5 Indirect N₂O emissions from manure management (3.C.6)

This category uses a substantial amount of data already entered in 3.A.2 category. To **ensure consistency** of data entries between categories, use the following approach:

- Before data entry in 3.C.6: Follow the sequence of category data entries. Specifically, enter the data for 3.A.1 and 3.A.2 **BEFORE** making data entries in category 3.C.6.
- During data entry to 3.C.6: When possible, use the “**Set from 3.A.2 AD**” button to automatically insert the relevant values (**Figure 98. Entering the data in category group 3.C.6**).
- After data entry to 3.C.6: Use SAGE function **Validate** to check if the total amount of NEMms in category 3.A.2 is consistent with this value in category 3.C.6 (figure 80).

Figure 94. Use of the Validate function to check consistency between category data entries

Time-series ADC	year	aggregation	emission type	climate	livestock type	MMS type	3.A.2 NEMms	3.C.6 NEMms	valid
AG_TEST_2020-2023	2020	Bottom region	Volatilisation	Cool Temperate Moist	Dairy Cow > Mature > High-producing	Daily spread	314650		✗
AG_TEST_2020-2023	2020	National	Volatilisation	Boreal Dry	Swine	Solid storage		300000	✗
AG_TEST_2020-2023	2020	National	Volatilisation	Cool Temperate Moist	Dairy Cow	Pasture/Range/Paddock	85775000		✗
AG_TEST_2020-2023	2020	National	Volatilisation	Cool Temperate Moist	Buffalo	Aerobic treatment		3518.8	✗
AG_TEST_2020-2023	2020	National	Volatilisation	Tropical Dry	Buffalo > Mature Non-dairy	Pasture/Range/Paddock	32347750		✗
AG_TEST_2020-2023	2020	National	Nitrogen leaching	Warm Temperate Dry	Sheep > Growing Lambs	Aerobic treatment	25486.9484		✗
AG_TEST_2020-2023	2020	Middle region	Volatilisation	Cool Temperate Moist	Dairy Cow	Daily spread	22000000		✗
AG_TEST_2020-2023	2020	Bottom region	Nitrogen leaching	Cool Temperate Moist	Dairy Cow > Mature > High-producing	Daily spread	314650	314650	✓

The process of data entries for 3.C.6 follows the same general steps as described for other agriculture categories:

Step 1 for these categories is the same as for subcategories of category 3.A. The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 47)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Configuration – Agriculture Category Specific; Table (Climate zone, Livestock)

Figure 95. Configuration – Agriculture Category Specific; Table (Climate zone, Livestock) links are in the red frames

Climate zones - List

id	name	code	MAT, °C	Mean winter °C	MAT min, °C	MAT max, °C	Elevation min, m	Elevation max, m	MAP min, mm	MAP max, mm	Frost days	status
1	Boreal Dry	boreal-dry	2	-15	-5	10					<1	enabled
2	Boreal Moist	boreal-moist	3	-15	-5	10					>1 180	enabled
3	Cool Temperate Dry	cool-temp-dry	5	3	0	10					<1 10	enabled
4	Cool Temperate Moist	cool-temp-moist	5	3	0	10					>1 10	enabled
5	Polar Dry	polar-dry	-15	-30		-1					<1 270	enabled
6	Polar Moist	polar-moist	-15	-30		-1					>1 270	enabled
7	Tropical Dry	trop-dry	25	20	15	28			999		<1 0	enabled
8	Tropical Moist	trop-moist	25	20	25	28		1000	2000		>1 0	enabled
9	Tropical Mountain	trop-mont	20	20	23	26	1001				<1 0	enabled

Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.1 section in the agriculture category-specific section of the configuration tables:

Configuration – Agriculture Category Specific > 3.A> Table (MMS types)

Figure 96. Configuration – Agriculture Category Specific > 3.A> Table (MMS types) links are in the red frames

MMS types - List

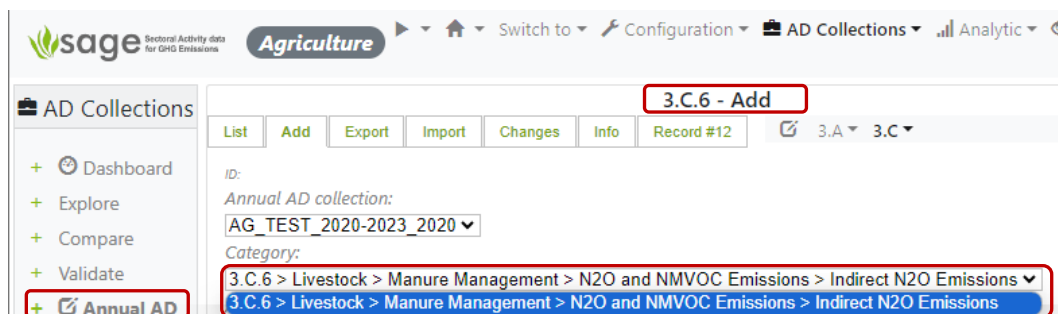
id	code	name	description	status
15	aero-treat	Aerobic treatment	The biological oxidation of manure collected as a liquid with with...	enabled
8	ana-digester	Anaerobic digester	Animal excreta with or without straw are collected and anaerobic...	enabled
9	burned	Burned for fuel	The dung and urine are excreted on fields. The sun dried dung co...	enabled
10	deep-bedding	Cattle and Swine deep bedding	This manure management system also is known as a bedded pa...	enabled
11	comp-vessel	Composting - In-vessel	Composting, typically in an enclosed channel, with forced aeratio...	enabled
13	comp-intensive	Composting - Intensive windrow	Composting in windrows with regular (at least daily) turning for ...	enabled
14	comp-passive	Composting - Passive windrow	Composting in windrows with infrequent turning for mixing and ...	enabled
12	comp-static	Composting - Static pile	Composting in piles with forced aeration but no mixing	enabled
2	daily-sp	Daily spread	Manure is routinely removed from a confinement facility and is a ...	enabled
4	dry-lot	Dry lot	A paved or unpaved open confinement area without any signific...	enabled
5	liquid-sl	Liquid/slurry	Manure is stored as excreted or with some minimal addition of w...	enabled
1	past-range-pad	Pasture/Range/Paddock	Manure from pasture and range grazing animals is allowed to liv...	enabled
7	pit-sto-below	Pit storage below animal confinements	Collection and storage of manure usually with little or no added ...	enabled
16	poultry-litter	Poultry manure with litter	Similar to cattle and swine deep bedding except usually not com...	enabled
17	poultry-no-litter	Poultry manure without litter	May be similar to open pits in enclosed animal confinement faci...	enabled
3	solid-st	Solid storage	Storage of manure, typically for several months, in unconfined pi...	enabled

Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

The category selection in SAGE follows the IPCC approach and includes a combination of the process leading to GHG emissions + basic livestock type (**Figure 97**). For example,

- 3.C.6> Livestock > Manure Management > N₂O and NMVOC Emissions> Indirect N₂O Emissions

Figure 97. Category selection in SAGE



The screenshot shows the SAGE web interface. On the left, there is a sidebar with 'AD Collections' and a list of options: Dashboard, Explore, Compare, Validate, and 'Annual AD' (highlighted with a red box). The main area is titled '3.C.6 - Add' (highlighted with a red box). Below the title, there are tabs: List, Add, Export, Import, Changes, Info, and Record #12. The 'Add' tab is active. In the 'Annual AD collection:' section, the value 'AG_TEST_2020-2023_2020' is entered. In the 'Category:' section, a dropdown menu is open, showing a path: '3.C.6 > Livestock > Manure Management > N2O and NMVOC Emissions > Indirect N2O Emissions' (highlighted with a red box). The 'Add' button is highlighted in the top right.

Category-specific fields additional to those described in section 8.1.3 include:

- Data collection period (months) (default is on the annual basis = 12 months)
- Emission type (select **Nitrogen leaching** or **Volatilisation**)
- Climate zone (select specific climate zone most applicable to your country or make regional entries)
- Livestock type (contains livestock subdivisions available for the selected category)
- Manure management system type (select from available options)
-
- Once category-specific parameters are entered or selected, enter the data into the provided data fields:
 - Total N excretion (NEmms) per year – SAGE offers to use “Set from 3.A.2 AD” button for this value. If the data for this region/climate zone/animal type, MMS have already been entered in 3.A.2 category, please use this button to ensure consistency of data entries between categories.
 - Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click the “Update” button to display the complete record on the screen and, if everything is correct, press “Add” button to save your record and add it to the collection (**Figure 110**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 110**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 111**).

Figure 98. Entering the data in category group 3.C.6

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- + **Annual AD**
- + Manage all
- + Draft
- + Review
- + Approve
- + Publish

3.C.6 - Add

List Add Export Import Changes Info Record #12

Form entry details updated

ID: Annual AD collection: AG_TEST_2020-2023_2020

Category: 3.C.6 > Livestock > Manure Management > N2O and NMVOC Emissions > Indirect N2O Emissions

Aggregation: Bottom region

Statistics quality: Unknown

Tier: T1

Data collection period (months): 12

Emission type: Volatilisation

Climate zone: Cool Temperate Moist

Livestock type: Dairy Cow > Mature > High-producing

Manure management system type: Daily spread

Total N excretion (NEms) per year : 514,650.00 kg : calculated > NA Set from 3.A.2 AD

Uncertainty details Set from default

Total N excretion uncertainty : 20.00 % : application default > NA

Calculated

Calculated amount of N contributing to N2O emissions: 360,255.0

Parameters

Configuration default

name	code	var.name	value	units	uncert.%	description
N fraction	n-fraction	Fract	0.70	fraction	0.0	Fraction of N in manure contributing to N2O emission (Frac(GasMS) or Frac(LeachMS))

State: draft

Add Update Cancel

Save the record and add it to the collection (for new records this will be the “ADD” button; for edited records – the “Save” button)

Common data for all categories

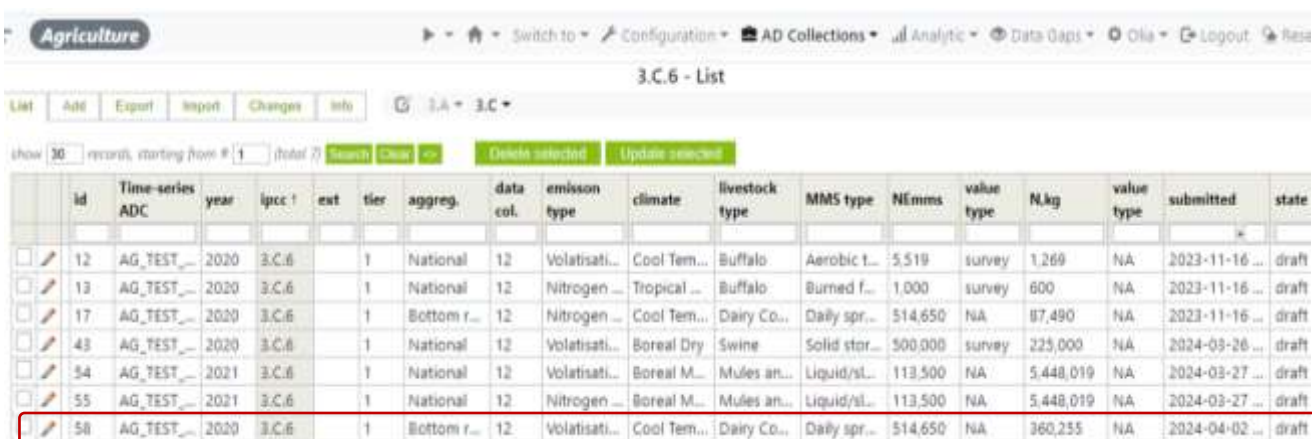
Category-specific settings

Data entry fields that appear after Livestock type is selected

Calculated by SAGE

Parameters used for the calculations

Figure 99. The list of records is updated



	id	Time-series ADC	year	ipcc	est	tier	aggreg.	data col.	emission type	climate	livestock type	MMS type	NEmms	value type	N.kg	value type	submitted	state
<input type="checkbox"/>	12	AG_TEST_...	2020	3.C.6		1	National	12	Volatisati...	Cool Tem...	Buffalo	Aerobic t...	5,519	survey	1,269	NA	2023-11-16 ...	draft
<input type="checkbox"/>	13	AG_TEST_...	2020	3.C.6		1	National	12	Nitrogen ...	Tropical ...	Buffalo	Burned f...	1,000	survey	600	NA	2023-11-16 ...	draft
<input type="checkbox"/>	17	AG_TEST_...	2020	3.C.6		1	Bottom r...	12	Nitrogen ...	Cool Tem...	Dairy Co...	Daily spr...	514,650	NA	87,490	NA	2023-11-16 ...	draft
<input type="checkbox"/>	43	AG_TEST_...	2020	3.C.6		1	National	12	Volatisati...	Boreal Dry	Swine	Solid stor...	500,000	survey	223,000	NA	2024-09-26 ...	draft
<input type="checkbox"/>	54	AG_TEST_...	2021	3.C.6		1	National	12	Volatisati...	Boreal M...	Mules an...	Liquid/sl...	113,500	NA	5,448,019	NA	2024-03-27 ...	draft
<input type="checkbox"/>	55	AG_TEST_...	2021	3.C.6		1	National	12	Nitrogen ...	Boreal M...	Mules an...	Liquid/sl...	113,500	NA	5,448,019	NA	2024-03-27 ...	draft
<input type="checkbox"/>	58	AG_TEST_...	2020	3.C.6		1	Bottom r...	12	Volatisati...	Cool Tem...	Dairy Co...	Daily spr...	514,650	NA	360,255	NA	2024-04-02 ...	draft

8.2.2.5 Rice cultivation (3.C.7)

The 2006 IPCC Methodological Guidelines for National GHG inventories considers the Rice cultivation category as an aggregate source of CH₄ emissions on land. Anaerobic decomposition of organic material in flooded rice fields produces methane (CH₄), which escapes to the atmosphere primarily by transport through the rice plants. These emissions are linked with the following elements that are parts of Activity data and are covered in SAGE:

- area of rice cultivation
- number and duration of types of crops grown
- water regimes before and during the cultivation period
- organic and inorganic soil amendments
- additional parameters that affect emissions, but are used mostly in higher-tier approaches are soil type, temperature, and rice cultivar

As for other categories of the agriculture sector, category 3.C.7 requires setting general, sector-specific cross-category, and category-specific parameters in the configuration tables before entering the data in the activity data form.

Tiers 1 and 2 for this category share the form structure, however, tier 2 methodology requires a more disaggregated approach to the activity data and using country-specific rather than IPCC default parameters and emission factors. Tier 3 includes models and monitoring networks tailored to address the national circumstances of rice cultivation repeated over time, driven by high-resolution activity data and disaggregated at the sub-national level. For this reason, the basic SAGE tool provides defaults and parameter lists for T1 and T2, the parameter lists may need to be extended if Tier 3 with a country-specific model is used which could be done through a SAGE customization project.

To enter the activity data, the same pattern of steps 1 – 4 is used for the category.

Step 1 for these categories is the same as for subcategories of category 3.A. The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Configuration – Agriculture sector > Table (Regions, Land use subdivisions) (Figure 100)

Figure 100. Configuration – Agriculture tables; Regions and Land use subdivisions table links in the red frames

id	code/group	name	display name	description	basic
1	crop	Cropland	Cropland		✓
2	crop annual	Annual crops	Cropland > Annual crops		✓

Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.7 section in the agriculture category-specific section of the configuration tables:

Configuration – Agriculture sector > 3.C.7 > Tables Rice cultivar, Water regime (pre-cultivation), Water regime (cultivation), Rice ecosystem water regimes, Calculated parameters) (Figure 101)

Figure 101. Configuration – Agriculture category-specific → 3.C.7; Calculated parameters table link in the red frame

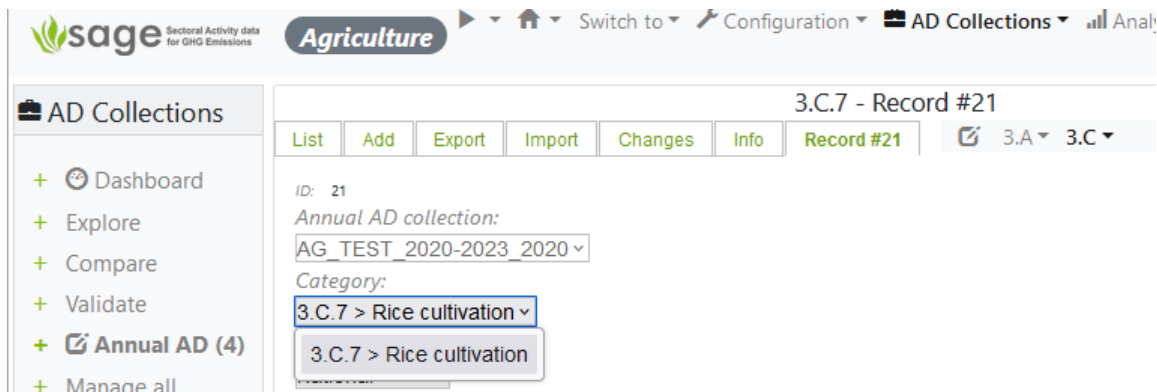
id	parameter	year	aggregation	rice ecosystem	water regime (pre-cult.)	water regime (cultivation)
25	Application rate of compost		Any			
26	Application rate of farmyard manure					
27	Application rate of green manure					
28	Application rate of other organic amendment					
29	Application rate of rice straw incorporated long					
30	Application rate of rice straw incorporated shortly					
24	Soiling factor for other parameters					
23	Water regime change scaling factor				Non-flooded pre-season > 180 days	
21	Water regime change scaling factor				Flooded pre-season > 30 days	
22	Water regime change scaling factor				Non-flooded pre-season < 180 days	
20	Water regime change scaling factor				Aggregated	
14	Water regime scaling factor			Irrigated		intermittently flooded - single
10	Water regime scaling factor			Deep water		Deep water rice
18	Water regime scaling factor			Upland		Aggregated
15	Water regime scaling factor			Rainfed		Aggregated
11	Water regime scaling factor			Irrigated		Aggregated
19	Water regime scaling factor			Upland		Upland
13	Water regime scaling factor			Irrigated		intermittently flooded - multiple
9	Water regime scaling factor			Deep water		Aggregated
17	Water regime scaling factor			Rainfed		Regular rainfed

Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (Figure 111). There are no default subcategories to 3.C.7 category

3.C.7> Rice cultivation

Figure 102. Category selection in SAGE



Category-specific fields additional to those described in section 8.1.3 include:

- Data collection period (use **12 months** as the default value)
- Region (select **Unspecified** if unknown or not applicable)
- Land use subdivision (select from the provided options as applicable)
- Rice ecosystem (select from the provided options as applicable)
- Water regime (cultivation) (use **Aggregated** if unknown)
- Water regime (pre-cultivation) (use **Aggregated** if unknown)
- Rice cultivar (select **Unspecified** if unknown or there is no data for further disaggregation)
- Soil type (use **Any** if no data available or unknown) – not needed for T1
- Rice crop practice (use **Unspecified** if no data is available or unknown)

Please note that all selection options appear as they are set in the configuration tables. If the selection menu does not include an option that should be applicable, consult with your technical expert or the system administrator and request adding this option in the relevant configuration tables.

Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- Annual harvest area (**ha**)
- Rice cultivation period (days)
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

Underneath, there are two sections on this page:

- “calculated” to show calculated values on a basis of the entered data and the data available from the configuration tables
- “Parameters” to show which parameters from the configuration layer were used for the calculation

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 103**)

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 103**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 104**).

Figure 103. Entering the data in category group 3.C.7

AD Collections

- + Dashboard
- + Explore
- + Compare
- + Validate
- + **Annual AD (4)**
- + Manage all
- + Draft (4)
- + Review (0)
- + Approve (0)
- + Publish (0)

Agriculture

3.C.7 - Record #21

List Add Export Import Changes Info Record #21 3.A 3.C

ID: 21

Annual AD collection: AG_TEST_2020-2023_2020

Category: 3.C.7 - Rice cultivation

Aggregation: National

Statistics quality: Unknown

Tier: T2

Data collection period (months): 12

region: Unspecified

Land use subdivision: Cropland > Annual crops > Rice > Deep Water (custom)

Rice ecosystem: Deep water

Water regime (cultivation): Deep water rice

Water regime (pre-cultivation): Aggregated

Rice cultivar: Unspecified (custom)

Soil type: Any (custom)

Rice crop practice: Unspecified

Annual harvest area : 3,000.00 ha : manual entry > NA

Rice cultivation period, days: 135.00 number : manual entry > NA Set from default

Uncertainty details Set from default :

Annual harvest area uncertainty : 20.00 % : application default > NA

Rice cultivation period uncertainty : 20.00 % : application default > NA

Calculated

Annual harvest area (ha): 3,000.0

SFa: 1.0

Parameters

Configuration default

name	code	var.name	value	units	uncert.	
Application rate of compost	roa-compost	roa_compost	6.00	t/ha	10.0	
Application rate of farmyard manure	roa-farm-manure	roa_YM	5.00	t/ha	10.0	
Application rate of green manure	roa-green-manure	roa_GM	2.00	t/ha	20.0	
Application rate of rice straw incorporated shortly	roa-straw-short	roa_straw_short	3.00	t/ha	20.0	Application rate of rice straw incor
Application rate of rice straw incorporated long	roa-straw-long	roa_straw_long	3.00	t/ha	20.0	Application rate of rice straw incor
Application rate of other organic amendment	roa-other	roa_other	3.00	t/ha	20.0	Application rate of other organic a
Water regime scaling factor	sf-water-reg-sw	SFw	0.31	fraction	25.0	Default scaling factor to account f
Water regime change scaling factor	sf-water-reg-sp	SFp	1.22	fraction	15.0	Default scaling factor to account f

State: draft

Save Delete Update Cancel

Save the record and add it to the collection (for new records this will be the "ADD" button; for edited records – the "Save" button)

Common data for all categories

Category-specific settings; they may appear once the common data are entered if the form is filled the first time

Data entry fields to fill after category-specific settings are entered/selected

Calculated by SAGE

Parameters used for the calculations

Figure 104. The list of records is updated

Agriculture

Switch to

Configuration

AD Collections

Analytics

Data Gaps

GIS

Logout

Reset

3.C.7 - List

List

Add

Export

Import

Changes

Info

+ Record [rec_id=21] has been saved

show 20 records, starting from # 1

Filter By

Search

Clear

Done selected

		id	Time-series ADC	year	ipcc	ext	tier	aggreg.	data col.	region	land use	rice ecosystem	water regime	water regime before	rice cultivar	soil type	cropping practice	cultivation period	harvest area, ha	value type	SFw	SFp	SFLs	SFo	submitted	state	
<input type="checkbox"/>		21	AG_TES...	2020	3.C.7		2	National	12		Deep W...	Deep wa...	Deep w...	Aggreg...	Unspeci...	Any		135	3,000.00	NA	0.31	1.22	1.00	3.71	2024-04-02 ...	draft	
<input type="checkbox"/>		22	AG_TES...	2020	3.C.7		1	National	12		Rice Cul...	Irrigated	Continu...	Non-flo...	Unspeci...	Any		115	1,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		23	AG_TES...	2020	3.C.7		1	National	12		Rice Cul...	Irrigated	Intermit...	Non-flo...	Unspeci...	Any		120	1,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		24	AG_TES...	2020	3.C.7		1	National	12		Rice Cul...	Irrigated	Intermit...	Non-flo...	Unspeci...	Any		110	1,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		25	AG_TES...	2020	3.C.7		1	National	12		Rainfed	Rainfed	Drought...	Flooded...	Unspeci...	Any		115	5,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		26	AG_TES...	2020	3.C.7		1	National	12		Rainfed	Rainfed	Regular...	Non-flo...	Unspeci...	Any		115	5,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		27	AG_TES...	2020	3.C.7		1	National	12		Rice Cul...	Upland	Upland	Non-flo...	Unspeci...	Any		135	2,000.00	NA	1.00	1.00	1.00	1.00	2023-12-08 ...	draft	
<input type="checkbox"/>		34	AG_TES...	2021	3.C.7		1	National	12		Rice eco	Rainfed	Regular	Aggreg...	Other	Volcanic	Templa...	180	500,000	NA	0.28	1.22	1.00	3.71	2024-03-16 ...	draft	
<input type="checkbox"/>		41	AG_TES...	2020	3.C.7		1	National	12			Irrigated	Intermit...	Non-flo...	Unspeci...	High sc...		135	1,000.00	NA	0.32	1.00	1.00	3.71	2024-03-19 ...	draft	

8.2.2.5 N₂O emissions from aquaculture (3.C.12)

Category 3.C.12 does not provide rigidly fixed subcategories; the activity names within the category that would define the subcategory names are user-defined. To maintain time series consistency, SAGE provides the expandable activity listing table in the configuration layer for 3.C.12.

To enter the activity data, the same pattern of steps 1 – 4 is used for the category.

Step 1 for these categories is the same as for subcategories of category 3.A. The technical expert should check and update the levels of aggregations and potential data sources (tables Aggregations and Institutions) listed according to the country's national circumstances:

Configuration - basic > Tables (Aggregations, Institutions) (Figure 49)

Step 2 for these subcategories requires checking and updating the following tables in the cross-category section of the configuration tables for the agriculture sector:

Figure 105. Configuration – Agriculture sector > Table (Regions)

	id	code/group	name	display name	description	status
<input type="checkbox"/>	1	top-reg	Top region	Top	XXX	enabled

Step 3 for these subcategories requires checking and updating the calculated parameters under 3.C.12 section in the agriculture category-specific section of the configuration tables:

Configuration – Agriculture sector > 3.C.12 > Table (Activity name) (Figure 106)

Figure 106. Configuration – Agriculture sector > 3.C.12 > Table (Activity name)



id	code/group	name	display name
2	shrimp-prod	Shrimp production	3.C.12 > Aquaculture > Shrimp
3	fish-prod	Fish production production	3.C.12 > Aquaculture > Fish production

Step 4 fill in the activity data entry forms in the AD Collection block in SAGE.

The category selection in SAGE follows the IPCC approach and includes the process leading to GHG emissions (**Figure 107**) with user-defined subcategories 3.C.12 category

3.C.12> N2O emissions from agriculture><Activity name>

Figure 107. Category selection in SAGE



Annual AD collection:

Select

Category:

3.C.12 > N2O emissions from aquaculture

3.C.12 > N2O emissions from aquaculture

Category-specific fields additional to those described in section 8.1.3 include:

- Region (select **Unspecified** if unknown or not applicable)

Please note that all selection options appear as they are set in the configuration tables. If the selection menu does not include an option that should be applicable, consult with your technical expert or the system administrator and request adding this option in the relevant configuration tables.

Once category-specific parameters are entered or selected, enter the data into the provided data fields:

- Total mass of aquaculture production per year (mass units)
- Uncertainty block for the above parameters – includes “Set from default” button for an automatic entry of default parameters that were entered in the configuration layer.

There are no calculated fields on this page:

Click the “Update” button to display the complete record on the screen and, if everything is correct, press the “Add” button to save your record and add it to the collection (**Figure 108**).

Note that the state of this record is currently “draft”. If you are not planning to work with this record anymore and it is ready for review, change the state to “ready” (**Figure 108**).

When you press the “Add” button, SAGE displays the list of all records for the category (**Figure 109**).

Figure 108. Entering the data in category group 3.C.12

3.C.12 - Record #31

ID: 31

Annual AD collection: AG_TEST_2020-2023_2022

Category: 3.C.12 > N2O emissions from aquaculture

Aggregation: National

Statistics quality: Well developed

Tier: T2

Region: Unspecified

Activity: Shrimp production

Total mass of aquaculture production per year : 1,000.00 kg : manual entry > survey

Uncertainty details Set from default

Total mass of aquaculture production per year uncertainty : 20.00 % : application default

Calculated

Total mass of aquaculture production per year: 1,000.00 kg

State: draft

Save Delete Update Cancel

Common data for all categories

Category-specific settings; they may appear **once** the common data are entered if the form is filled the first time

Data entry fields to fill after category-specific settings are entered/selected

Calculated by SAGE

Figure 109. The list of records is updated

3.C.12 - List

show 30 records, starting from # 1 (total 3) Search Clear Delete selected

	id	Time-series ADC	year	ipcc 1	ext	tier	aggreg.	region	activity	aquaculture production, kg	value type	submitted	state
<input checked="" type="checkbox"/>	31	AG_TEST_2020-2023	2022	3.C.12		2	National			1,000.00	NA	2024-03-16 07:54:06	draft
<input type="checkbox"/>	32	AG_TEST_2020-2023	2022	3.C.12		2	National			1,000.00	NA	2024-03-16 08:01:20	draft
<input type="checkbox"/>	33	AG_TEST_2020-2023	2022	3.C.12		2	National			1,000.00	NA	2024-03-16 08:01:38	draft

9. Activity Data (AD) Collections - Waste

9.1 AD Collections Data Entry Process

The AD collection data entry process is a subset of the 'AD Collections' process (see 5.1.1 *The overall 'AD Collections' process* on page 15).

9.1.1 Background

General

The Annual AD collection data page enables you to view, insert, edit and delete AD collection activity data and information.

To view, edit, remove and enter new records, in the left menu of the page, click Annual AD and the system will show the list of existing annual AD collections and their records available for editing. Above the table with the existing annual AD collections, you will see the major waste sector category groups with drop down lists (4.A, 4.B, 4.C, 4.D, and 4.E), (**Figure 110**).

Figure 110. Displaying annual data collections – Waste

AD Collections

Dashboard

Explore

Compare

Annual AD (12)

Manage all

Draft (12)

Review (0)

Approve (0)

Publish (0)

Annual AD (12) - Edit existing

Edit existing

Add missing

Info

4A > 4B > 4C > 4D > 4E >

show 20 records, starting from # 1 (total 20)

Export

Clear

id	ipcc	ext	tier	submitted	Time-series AD collection	code	state	year	aggreg.	value	val. units	val.type
13	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	1.24	Gg	NA
7	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	5.44	Gg	NA
2	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2000	draft	2000	National	62.63	Gg	NA
14	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	3.89	Gg	NA
8	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	5.91	Gg	NA
3	4.A.1		1	2023-01-10	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2000	draft	2000	National	1000.00	Gg	NA
15	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	12.28	Gg	NA
9	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	0.00	Gg	NA
10	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	36.54	Gg	NA
11	4.A.1		1	2023-02-23	WASTE-TEST_2000-2005	WASTE-TEST_2000-2005_2001	draft	2001	National	17.57	Gg	NA

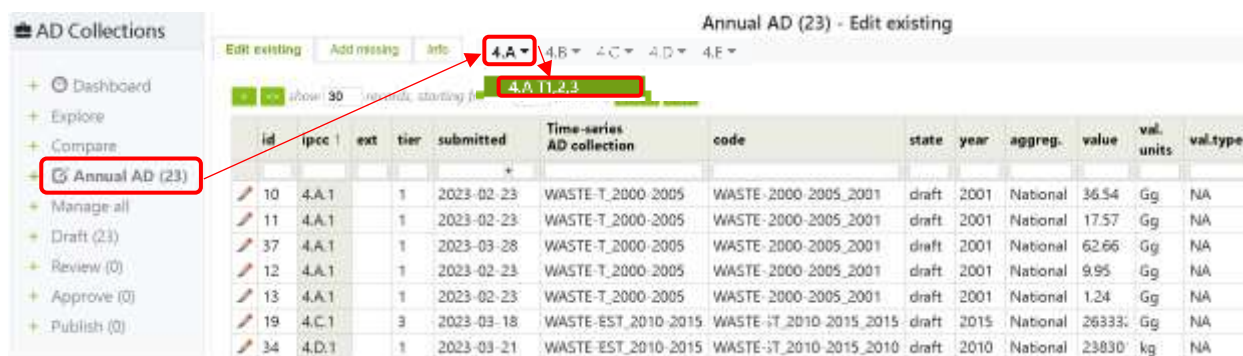
There are 3 tabs above the data table that allow to work with the entire pool of records from all available collections, categories and years:

- **Edit existing** – to view and edit the existing records
- **Add missing** – to identify which category entries are missing for each of the waste sector categories for each collection according to the years each AD collection covers. These can be filtered to rationalize the viewed information. Some generic information is offered for each missing record. To complete a missing record, use a “pencil” icon. This will prompt you to enter the missing information and data and then save the record. This method is useful if one or two records are missing. **To do a more systematic and extensive data entry, use category drop-down lists (4.A, 4.B, 4.C, 4.D, and 4.E, see sections 7.3.2 – 7.3.3 below).**
- **Info** – a brief description of available options on the page.

Working with individual categories

To start working with the records in the individual categories, select a category from a relevant drop-down list above the records table (4.A, 4.B, 4.C, 4.D, and 4.E). *The example below is based on one of the waste categories (4.A.1).* (**Figure 111**).

Figure 111. Selecting a waste sector category – category 4.A.1



id	ipcc	ext	tier	submitted	Time-series AD collection	code	state	year	aggreg.	value	val. units	val.type
10	4.A.1		1	2023-02-23	WASTE-T_2000-2005	WASTE-2000-2005_2001	draft	2001	National	36.54	Gg	NA
11	4.A.1		1	2023-02-23	WASTE-T_2000-2005	WASTE-2000-2005_2001	draft	2001	National	17.57	Gg	NA
37	4.A.1		1	2023-03-28	WASTE-T_2000-2005	WASTE-2000-2005_2001	draft	2001	National	62.66	Gg	NA
12	4.A.1		1	2023-02-23	WASTE-T_2000-2005	WASTE-2000-2005_2001	draft	2001	National	9.95	Gg	NA
13	4.A.1		1	2023-02-23	WASTE-T_2000-2005	WASTE-2000-2005_2001	draft	2001	National	1.24	Gg	NA
19	4.C.1		3	2023-03-18	WASTE-EST_2010-2015	WASTE-T_2010-2015_2015	draft	2015	National	26333	Gg	NA
34	4.D.1		1	2023-03-21	WASTE-EST_2010-2015	WASTE-T_2010-2015_2010	draft	2010	National	23830	kg	NA

The option tabs for record entries in the AD collection are the same as those for AD collection management, but they refer to a single record rather than to the entire AD collection:

- List** displays a table with the list of records; each record has a “pencil” icon at the beginning (this is the edit option) and a “cross” icon at the end (to delete a record),
- Add** allows entry of a new activity data record that includes the fuel consumption value and relevant supplementary information (e.g., fuel characteristics, uncertainty, and comments),
- Export** allows exporting existing activity data to an Excel (CSV) file,
- Import** allows importing data from Excel templates (for all tables and records, and for entire time series),
- Changes** contains a log of changes performed on records within the module,
- Info** provides relevant notes and guidance helping you understand available options and how to use them

9.1.2 How to edit activity data records

To edit existing AD collection names and details:

- Select category group from the drop-down lists above the record table (4.A, 4.B, 4.C, 4.D, and 4.E, **Figure 111**).
- In the **List** tab, you will see the existing table with records. Each record has a **pencil** button on the left for editing. “List” view opens by default when a category is selected from the drop-down list.
- To modify an entry, click the “pencil” button to the left of the record, then make your modification using the form provided, and
- To save the updated record, click **Save**.
- To remove a record from the list, click the **cross** icon to the right of the record.

9.1.3 How to add a new data record – manual entry

The process of adding a new activity data record is similar to adding a new AD collection. As explained above, this form has five category groups, shown by the tabs at the top. These are: 4A, 4B, 4C, 4D, and 4E.

Note that similar to the energy and the IPPU sectors, the waste sector categories have generic (common) and category-specific information fields parameters to hold category-specific parameters that change from category to category. The category you choose affects the data required in the form. Once both generic and category-specific information and data are entered, click 'Add' to add an item.

To add new activity data records:

- Select category group from the drop-down lists above the record table (4.A, 4.B, 4.C, 4.D, and 4.E, **Figure 111**).
- Click tab **Add** and then use the provided form to create a new record.
- Select **Annual AD collection** name from the drop-down list in the form
- Select **Category** with the required extension from the drop-down list in the form
- Select general information options in the provided drop-down lists:
 - **Aggregation** level (e.g., *national*)
 - **Statistics quality** (either *well developed* or *unknown*)
 - Methodological **Tier** (e.g., *T1*)
- Enter both activity data and supporting information in the provided information fields and menu items from the drop-down lists in the form
- For each entered parameter value:
 - select **Units** of measurement (from the drop-down list underneath the parameter field)
 - select **Source** of data/information from the provided drop-down list.
 - source information **Type** (*survey* for actual data and *modelled* otherwise)
 - optional entries:
 - **Date issued** to let others know when this data has been published/made available/recorded in format yyyy-mm-dd.
 - **Reference and comments** to record the link to the information source and make notes that might be useful to others – for example, this record is provisional, the final value will be available on dd/mm/yy from <person/organization>.
- Enter **Uncertainty**:
 - Option 1: click the button **Select from default** – SAGE will assign the value a default uncertainty according the to 2006 IPCC Guidelines
 - Option 2: use the manual entry to enter the country-specific uncertainty value in the provided information fields and enter the source for the uncertainty data.
- Select the **State** of the record (*draft* = you might come back to it and re-check or *ready* = the record is final and ready for the review).
- Click green button **Add** on the bottom of the form
- If you wish to enter more records (e.g., for the next year) – click again tab **Add** above the record (the one near **List**), and the new form pre-filled with the previous information will be appear. This is a quick way of entering several records, because you only need to make small edits in the provided entries and then again click green button **Add** on the bottom of the form without going to the main record page.

When the entries are complete, SAGE provides the summary of parameters as required for entering into the IPCC equations and saves the record in the database (**Figure 112**).

Figure 112. An example of SAGE-generated summary and output parameters for category 4.A.1.

Parameters		
Generic		
name	value	units
% Paper in industrial waste	0.0000	%
C to CH ₄ conversion factor	1.3333	fraction
DOCf	0.5000	fraction
Methane fraction	0.5000	fraction
OX	0.0000	fraction
Reaction delay time	6.0000	number
Starting year	1,950.0000	number
Wood % in industrial waste	0.0000	%
Emissions		
name	value	units
DOC	0.2000	fraction
Methane generation rate constant (1/years)	0.0500	fraction
Methane generation rate constant (1/years)	0.1000	fraction
Methane generation rate constant (1/years)	0.0650	fraction
Methane generation rate constant (1/years)	0.1700	fraction

Below we provide an overview of generic parameters and category-specific parameters for each major waste sector category and show where to find them in the data entry form.

General information fields (all entries here are mandatory) (Figure 113):

- Annual AD collection** Select Annual AD collection from the drop-down list
- Category** Select Waste category for the data entry
- Aggregation** Select the level of aggregation – national, regional, or facility – the list of aggregations relevant for your country will be set up in the relevant configuration table by your national inventory compiler. If additional aggregation levels are required (e.g., city, island, state) - they can easily be included by authorized users at the configuration level, please ask.
- Statistics quality** Describe the reliability of the data used; your selection in this option will help SAGE to determine the correct default level of uncertainty for the activity data if the actual uncertainty is unknown.
- Methodological tier** Identify the level of details required for the activity data entry. Note that when higher tiers (T2 or T3) are selected, additional information fields may become visible and mandatory for entry.
- Uncertainty details** Enter the percentage value, type (survey or modeled), source (e.g., IPCC or expert judgement), and any reference/comments. The uncertainty details could be entered manually or set from default by clicking the button “Set from default”. If this option is used, SAGE calculates the uncertainty using the logic and default parameters from the 2006 IPCC Guidelines.

Category-specific parameters

4.A category-specific entries

Subcategories of 4.A require information about climate zone, the type of waste being deposited, waste sites, and waste amounts ([Figure 112](#)). Please note that in case of 4.A, information on methane oxidation at SWDS is entered in the configuration tables.

Waste site type	Select waste site type from the drop-down list. If the waste site type is not known, select option “Any” (selected by default). For higher tiers, this parameter is mandatory.
Climate Zone	Select climate zone for the data entry
Waste type	Select the waste type – the selection is based on the following groups of waste: municipal solid waste (MSW), industrial waste, liquid fossil waste, other waste, and sludge – the list of available waste types relevant for your country will be set up in the relevant configuration table by your national inventory compiler. If additional waste types are required - they can easily be included by authorized users at the configuration level, please ask. Please note that an option total (bulk) waste for MSW is available for new entries for this category along with individual waste types.
Waste amount	Enter the amount of waste of the selected type deposited to the selected waste site. If “total (bulk)” option is selected for MSW, SAGE offers to calculate individual waste types using country’s population and distribution of the MSW across different waste types. These parameters are set up for you in the waste configuration tables for 4.A category. The distribution of MSW among different waste site types is also set up in the relevant configuration tables.

Please note that for all numerical entries, you will need to provide the metadata – units of measurement, source of the data are mandatory entries. Additional references, dates of data acquisition and data entry in format yyyy-mm-dd, and notes can also be entered in the relevant fields of the form.

Figure 113. Adding activity data to Waste – Category-specific information fields for 4.A

The screenshot displays the 'Waste' category-specific information fields for 4.A. The interface includes a sidebar with navigation options, a top bar with 'Waste' and '4.A T1,2,3 - Record #290', and a main form area. Red boxes and arrows highlight specific fields:

- Waste site type:** Any
- Climate zone:** Tropical and moist and wet
- Waste type:** Food waste
- Waste amount (wet):** 66.2005 Gg : calculated > calc-popul-based
- Calculate waste amount from population** (button)
- Value:** 66.20046342
- Units:** Gg
- Type:** calc-popul-based
- Value origin:** calculated
- Source:** Technical report
- Date issued:** yyyy-mm-dd
- Reference and comments:** waste_per_capita [kg per year] * population * SWDS_fraction * composition_fraction = 210 * 782234 * 1 * 0.403 = 66.20046342 [Gg]
- Details:**
 - Issued by:
 - Description: A report containing technical data on fuels
 - Organisation: please specify
 - Last edited by:
 - User: Ollia Admin (UNFCCC Data Collection Agency)
 - Date: 2023-03-29
- Uncertainty details:** Set from default
- Waste amount uncertainty:** 30.00 % : application default > NA

4.B category-specific entries

Category 4.B Biological treatment of solid waste requires information similar to 4.A and additionally, amount of recovered methane, the information on the collection frequency, and waste weight bases (wet/dry) (**Figure 114**). The reference field provided in the data entry form can be used to record the information on coverage (e.g., whether composting at households is included or not).

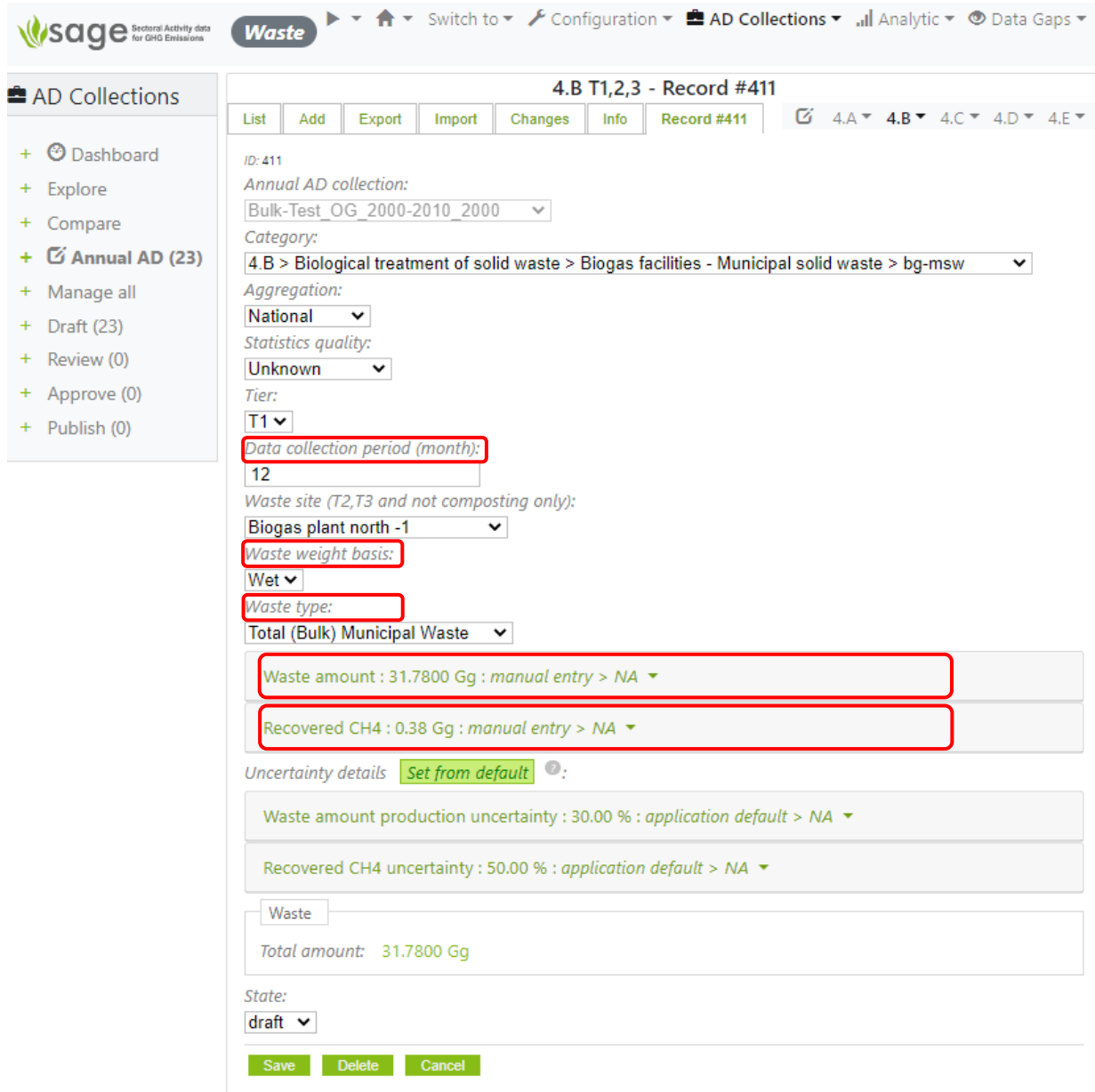
According to the 2006 IPCC Guidelines, anaerobic digestion of solid waste can be assumed to be zero where no data are available.

According to the 2006 IPCC Guidelines, higher tiers require similar parameters for calculating emissions, but in case of

- **Tier 1:** Tier 1 uses the IPCC default emission factors.
- **Tier 2:** Country-specific emission factors based on representative measurements are used.
- **Tier 3:** The method would be based on facility or site-specific measurements (on-line or periodic).

Therefore, for T2 and T3 entries, the waste site type is a mandatory entry.

Figure 114. Adding activity data to Waste – Category-specific information fields for 4.B



Waste 4.B T1,2,3 - Record #411

ID: 411

Annual AD collection: Bulk-Test_OG_2000-2010_2000

Category: 4.B > Biological treatment of solid waste > Biogas facilities - Municipal solid waste > bg-msw

Aggregation: National

Statistics quality: Unknown

Tier: T1

Data collection period (month): 12

Waste site (T2,T3 and not composting only): Biogas plant north -1

Waste weight basis: Wet

Waste type: Total (Bulk) Municipal Waste

Waste amount : 31.7800 Gg : manual entry > NA

Recovered CH4 : 0.38 Gg : manual entry > NA

Uncertainty details [Set from default](#) ?:

Waste amount production uncertainty : 30.00 % : application default > NA

Recovered CH4 uncertainty : 50.00 % : application default > NA

Waste

Total amount: 31.7800 Gg

State: draft

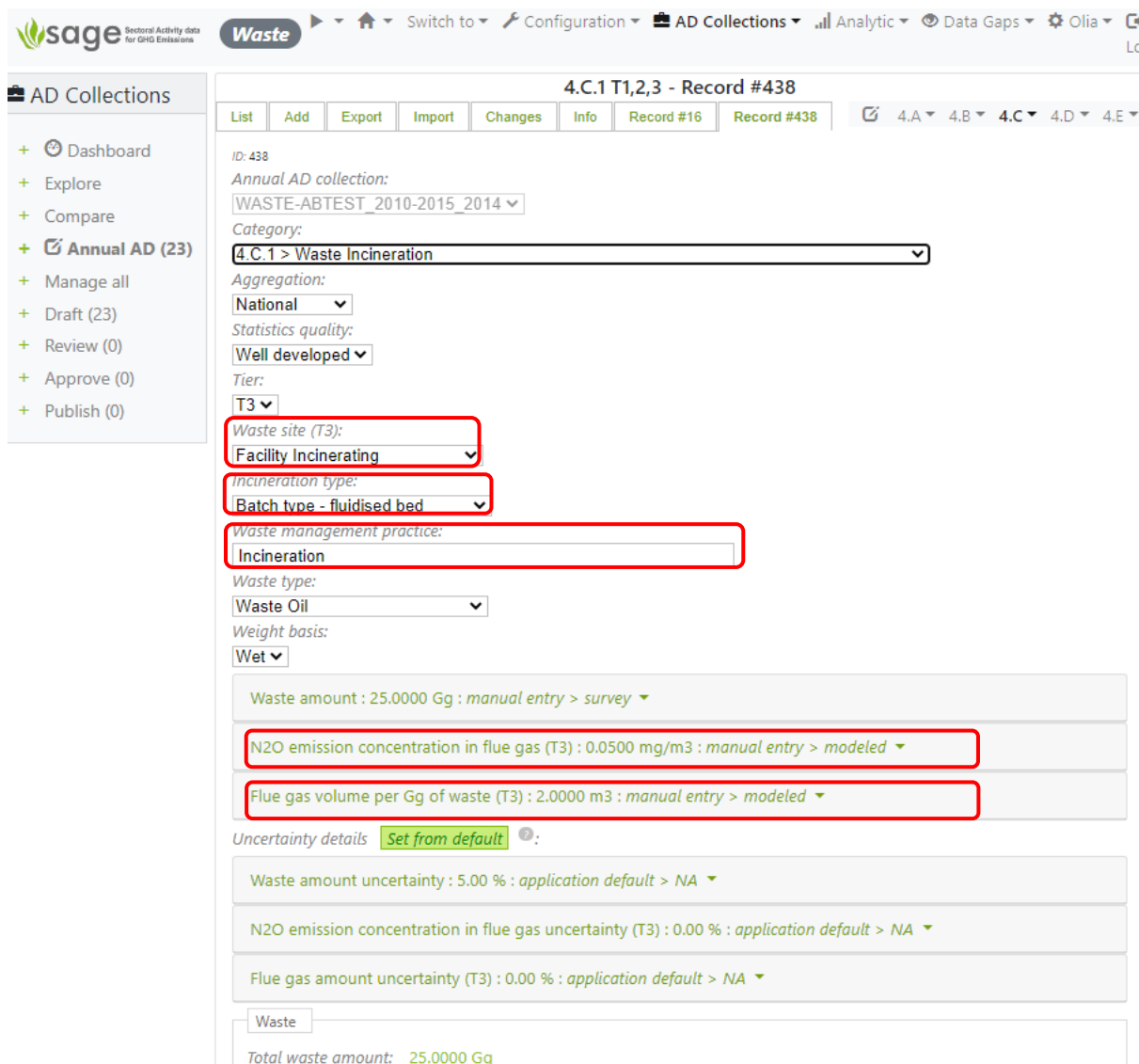
[Save](#) [Delete](#) [Cancel](#)

4.C category-specific entries

Subcategories of categories 4.C Incineration and open burning of waste require information similar to 4.A and 4.B. Additionally, for higher tiers, information on the incineration type/technology and waste

management practice is required for waste incineration entries, and for Tier 3 entries, N₂O concentration in flue gas volume per Gg of waste is also needed (**Figure 115**).

Figure 115. Adding activity data to Waste – Category-specific information fields for 4.C



The screenshot displays the 'Waste' category-specific information fields for record 438. The interface includes a sidebar with navigation options like Dashboard, Explore, Compare, and Annual AD (23). The main form is titled '4.C.1 T1,2,3 - Record #438' and contains various dropdown menus and text fields. Red boxes highlight specific fields: 'Waste site (T3): Facility Incinerating', 'Incineration type: Batch type - fluidised bed', 'Waste management practice: Incineration', 'N₂O emission concentration in flue gas (T3): 0.0500 mg/m³ : manual entry > modeled', and 'Flue gas volume per Gg of waste (T3): 2.0000 m³ : manual entry > modeled'.

4.D category-specific entries

Subcategories of categories 4.D Wastewater treatment and discharge are conceptually different from categories 4.A – C that describe different types of treatment of solid waste. Therefore, category-specific information fields for 4.D are also differ from 4.A – C. They include information on organics in wastewater, nitrogen and sludge removed from wastewater, methane recovered, as well as information on discharge pathways and whether industrial wastewater discharge is collected in sewers (**Figure 116**).

Industrial discharge collected in sewers Wastewater from industrial or commercial sources that is discharged into the sewer may contain protein (e.g., from grocery stores and butchers). The default for this fraction is 1.25, this parameter is mandatory.

TOW

Total organics in wastewater in the inventory year; this parameter is mandatory.

Discharge pathway

Select the different pathways for wastewater treatment and discharge – the list of available pathways relevant for your country will be set up in the relevant configuration table by your national inventory compiler. If additional pathways are required - they can easily be included by authorized users at the configuration level, please ask.

Please note that an option total (bulk) waste for MSW is available for new entries for this category along with individual waste types.

N removed with sludge

Enter the amount of nitrogen removed with sludge (default value is zero).

Total sludge removed

Enter the amount of sludge removed for incineration, landfills, and agricultural land (default value is zero).

Note that SAGE offers an option to calculate the total organics in wastewater on a basis of country's population, which is set up in the basic configuration table 'Country Details'.

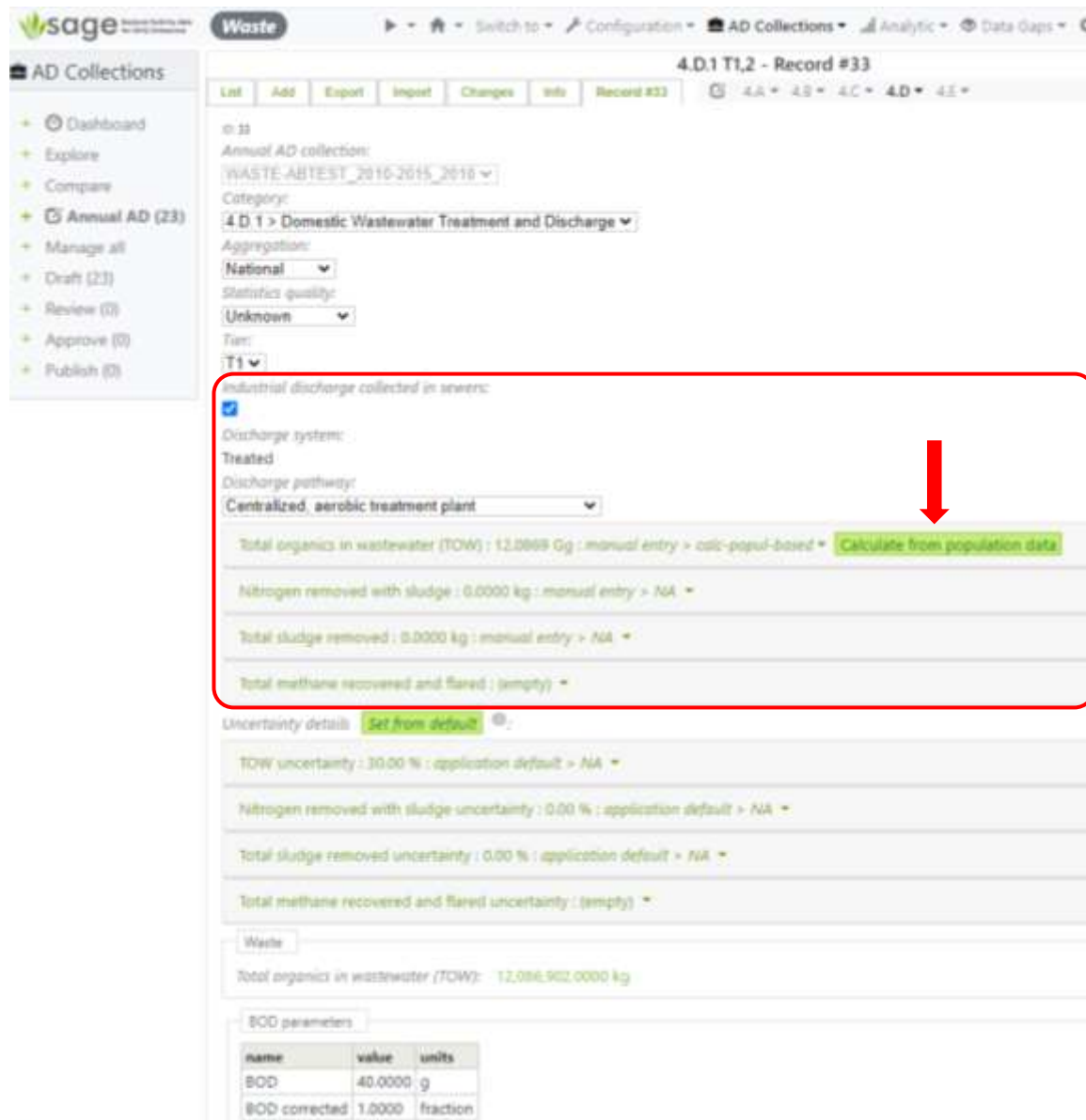
Other important information regarding wastewater treatment and discharge categories is available from the configuration tables in SAGE. The following groups of parameters does not need to be entered through the AD entry form because they are already stored in the **SAGE configuration layer**:

- **CH₄** configuration table includes the default methane correction factors (MCF) values for the different types of discharge pathway systems together with the maximum methane producing capacity.
- The **BOD** table is for the national technical experts to enter the country-specific values of BOD (with uncertainty), and an appropriate BOD correction factor (it is 1 if industrial wastewater is not discharged in the sewers together with domestic wastewater and 1.25 if it is).
- The **Income group** table is to describe how different discharge pathway systems are used by the population of different income groups and the degree of utilization of each pathway.
- The **N₂O** table shows default 2006 IPCC values for the key N₂O parameters and their uncertainties applicable to the 4.D category:
 - Fraction of nitrogen in protein
 - Factor to adjust for non-consumed protein, based on available protein
 - Factor to adjust for non-consumed protein, based on consumed protein
 - Factor to allow for co-discharge of industrial nitrogen into sewers. For countries with significant fish processing plants, this factor may be higher. Expert judgment is recommended.
- The **Industrial wastewater** table shows default 2006 IPCC values for the for industries generating wastewater:
 - Industries
 - Wastewater Generation amount
 - Chemical oxygen demand (COD)
 - Nitrogen content of wastewater (this value could be 0)

Where 2006 IPCC values were not available, they were sourced from research papers and engineering websites.

For each of parameters, their default IPCC value can be overwritten with the country-specific value.

Figure 116. Adding activity data to Waste – Category-specific information fields for 4.D.



Waste 4.D.1 T1,2 - Record #33

AD Collections

- Dashboard
- Explore
- Compare
- Annual AD (23)
- Manage all
- Draft (23)
- Review (0)
- Approve (0)
- Publish (0)

Annual AD collection: WASTE-ABTEST_2010-2015_2016

Category: 4.D.1 > Domestic Wastewater Treatment and Discharge

Aggregation: National

Statistics quality: Unknown

Time: T1

Industrial discharge collected in sewers: ☒

Discharge system: Treated

Discharge pathway: Centralized, aerobic treatment plant

Total organics in wastewater (TOW) : 12.0868 Gg : manual entry > calc-popul-based > **Calculate from population data**

Nitrogen removed with sludge : 0.0000 kg : manual entry > NA

Total sludge removed : 0.0000 kg : manual entry > NA

Total methane recovered and flared : (empty)

Uncertainty details: **Set from default**

TOW uncertainty : 30.00 % : application default > NA

Nitrogen removed with sludge uncertainty : 0.00 % : application default > NA

Total sludge removed uncertainty : 0.00 % : application default > NA

Total methane recovered and flared uncertainty : (empty)

Waste

Total organics in wastewater (TOW): 12,086,902,000 kg

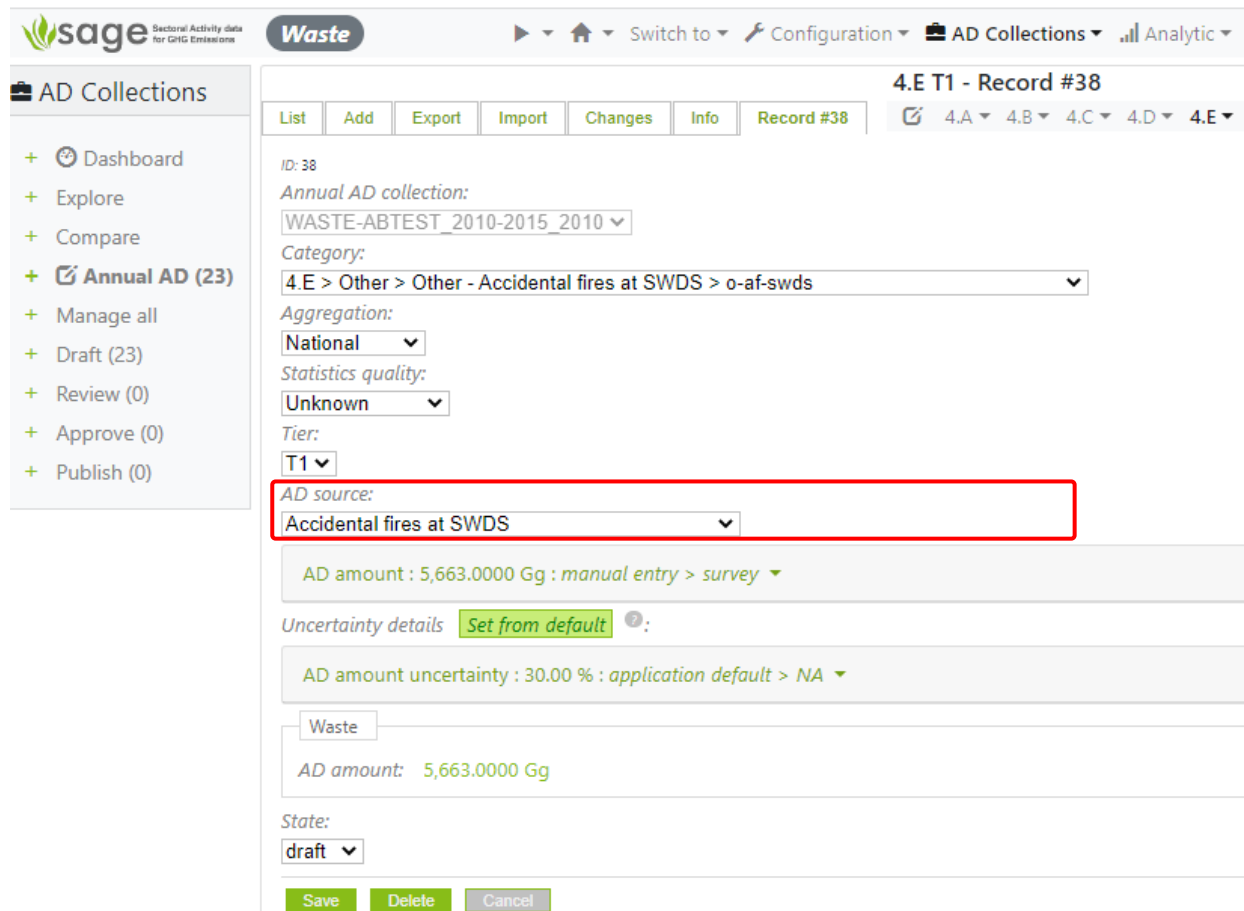
BOD parameters

name	value	units
BOD	40.0000	g
BOD corrected	1.0000	fraction

4.E category-specific entries

Category 4.E includes emission sources that were not covered in categories 4.A – D. SAGE provides a list of potential subcategories in the corresponding configuration table (the data are obtained from the UNFCCC Locator tool across all available countries). The only category-specific information field includes AD source. (**Figure 117**).

Figure 117. Adding activity data to Waste – Category-specific information fields for 4.E.



The screenshot displays the SAGE interface for adding activity data to a 'Waste' record. The left sidebar shows the 'AD Collections' menu with options like Dashboard, Explore, Compare, and Annual AD (23). The main content area is titled '4.E T1 - Record #38' and includes a toolbar with 'List', 'Add', 'Export', 'Import', 'Changes', 'Info', and 'Record #38'. The form fields are as follows:

- ID:** 38
- Annual AD collection:** WASTE-ABTEST_2010-2015_2010
- Category:** 4.E > Other - Accidental fires at SWDS > o-af-swds
- Aggregation:** National
- Statistics quality:** Unknown
- Tier:** T1
- AD source:** Accidental fires at SWDS (highlighted with a red box)
- AD amount:** 5,663.0000 Gg : manual entry > survey
- Uncertainty details:** Set from default (30.00 % : application default > NA)
- Waste:** AD amount: 5,663.0000 Gg
- State:** draft

At the bottom, there are 'Save', 'Delete', and 'Cancel' buttons.

10. Time series Data gaps

10.1 Background

Data gaps can cause many problems when trying to analyze time series. Filling gaps using appropriate methods can often resolve such problems.

The **Data Gaps** module enables time series analysis for any user-selected category (or any combination of categories), reveals data gaps, and guides users through applying different options to fill the data gaps according to the 2006 IPCC Guidelines. SAGE includes the following methods:

- Interpolation** to fill in internal data gaps for up to 3 points using linear regression,
- Extrapolation** to estimate missing data points in the beginning and in the end of the time series using linear regression,
- Expert judgement** filling the gaps on a basis of an expert's advice,
- Surrogate method** filling gaps using statistical methods.

SAGE includes explanatory information for each method and provides guiding messaging and relevant dialog boxes to help users navigating through different gap filling techniques.

Figure 118. The Data Gaps dashboard information

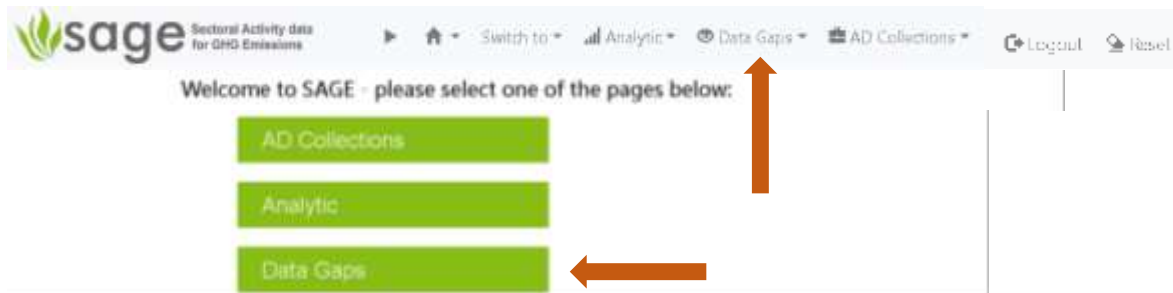


10.2 How to fill data gaps in a time series

- 1 Before performing the data gap filling, please read the Data Gaps **Dashboard** information; it gives a brief method overview and the guidance when each method should be used (**Figure 118**).

- click the **Data Gaps** menu in the global navigation pane across the top of the screen or use a quick link (**Figure 119**)

Figure 119. Go to Data Gaps



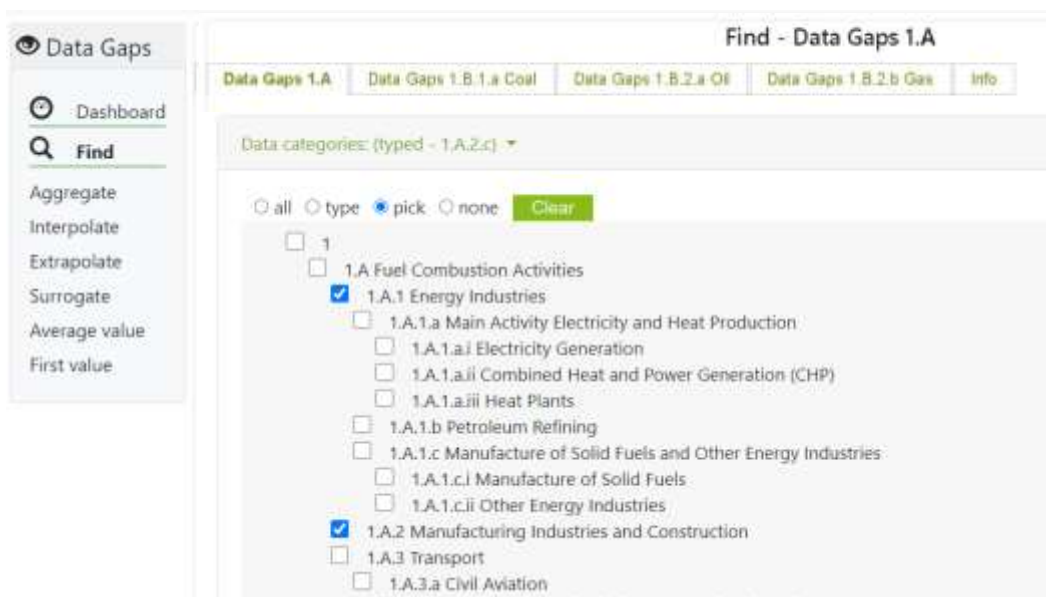
- click **Find** to find the gaps in the time series (**Figure 120**)

Figure 120. Click *Find* to make selection for the data gaps search



- select category (or categories) in which you'd like to search for data gaps. You can pick a single category or several categories, or type a category list in the field provided. If you are not sure which category has data gaps, select "all". In this case, SAGE will search all categories (**Figure 121**).

Figure 121. Selecting categories for data gap search




- 5 select fuel (or fuels) for which you'd like to search for data gaps. You can pick a single category or several categories, or type a category list in the field provided. If you are not sure which category has data gaps, select "all". In this case, SAGE will search all categories (**Figure 122**, all fuels are selected).
- 6 select the AD collection year (or years) in which you'd like to search for data gaps. You can type a single year, a list of years separated by commas, or a period (e.g., 2000-2010 as in **Figure 122**). The years with gaps are shown as *

Figure 122. Selecting fuels and years for data gap search



	id	ipcc/fuel	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	98/*	1.A.1.b /all	12,366.04	*	*	13,136.99	*	*	*	13,218.12	13,852.09	13,149.95	12,055.50
	105/*	1.A.2.c /all	19,149.28	16,032.18	12,590.70	14,333.07	19,434.64	206.64	18,552.83	19,495.55	30,253.42	*	*
	111/*	1.A.2.i /all	*	*	48,000.00	*	*	*	*	*	*	*	*

- 7 Click the 'eye' icon  at the beginning of each time series with data gaps to select the preferred method to fill the gaps from the available list. It shows the built-in gap filling options (external options are also possible but are not described here).

Time-series AD collection:

 Year(s):

 Categories with gaps:

	id	ipcc/fuel	2000	2001	2002	2003	2004
	98/*	1.A.1.b /all	12,366.04	*	*	13,136.99	*
		c /all	19,149.28	16,032.18	12,590.70	14,333.07	19,434.64
		/all	*	*	48,000.00	*	*

Aggregate

Inter./Extrapolate

Surrogate

Average value

First value

- 8 Select one of the 5 data gap filling options from the popup menu (above) and follow relevant instructions for that method as below in the relevant 'Gap filling option' section below:

Whichever gap filling method you choose, SAGE will default some selections to try and assist.

Gap filling option 1: Aggregate

If you use the "Aggregate" method to 'fill' data gaps it simply means you can report one category under an alternative category (because the dis-aggregated information is not available).

Aggregate data to the nearest higher category

When building time series for your AD collection, it is **good practice** to use the same collection period and methods consistently over the time series. However, for some categories, activity data may be unavailable for a few years or the entire time series, which creates the issue of data gaps. SAGE will help you to fill these data gaps and create a complete time series whenever possible.

Overall, there are several approaches to gap filling:

If you know that fuels are combusted in a category **X** for the entire time series, but can't distinguish this category from category **Y** for any of the years, then report all fuels combusted under both categories X and Y under a higher level category Z and make a note that fuels used in X and Y are reported under Z, and **explain transparently** why you did it that way.

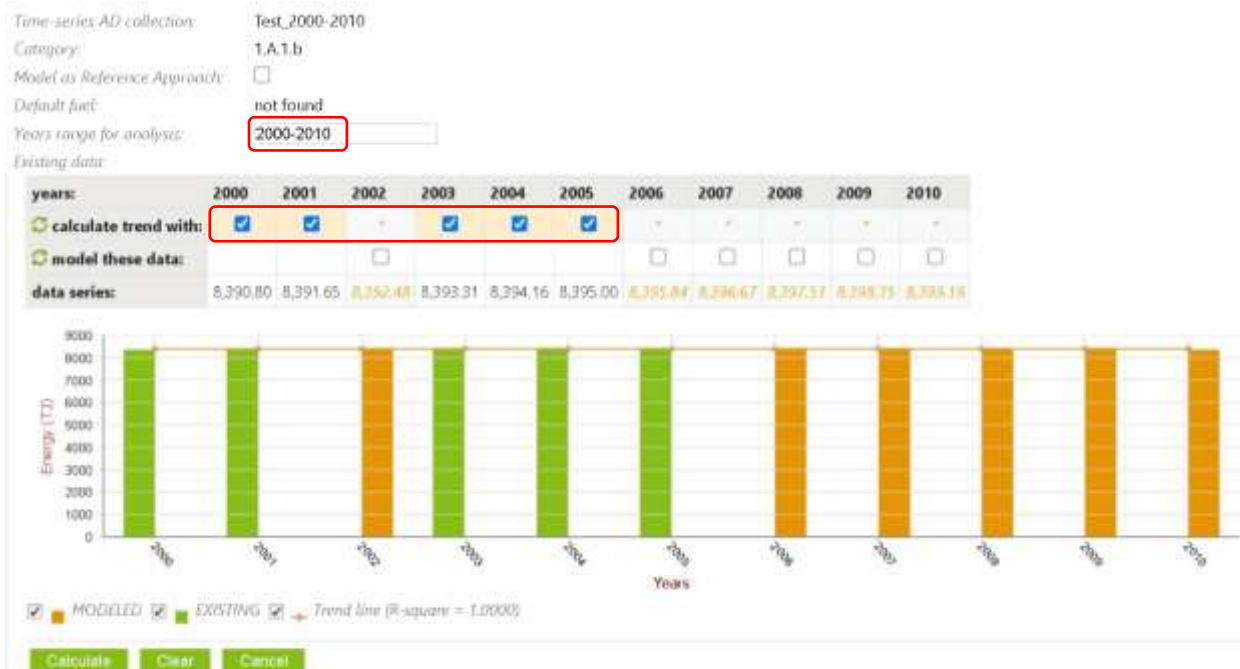
For example:

You are aware that your country has heat plants, electricity generation facilities, and a few plants that combine heat and power generations. However, only the total amount of fuels combusted by all heat and power-producing plants is known, and it is impossible to disaggregate further for the entire time period, you can report the total amount of fuels used from all these plants under the category "1.A.1.a - Main Activity Electricity and Heat Production", and make a note that the reliable data for different types of electricity and heat-producing plants are not available and therefore, they are included under 1.A.1.a.

Gap filling option 2: Interpolate / Extrapolate

To use the “Interpolation / extrapolation” method, simply choose which values to use and which gaps to interpolate (within a series of available data) or extrapolate (beyond the end[s] of available data).

You can use the check boxes at the bottom of the page (“Modeled”, “Existing” and “Trend line”) to show/hide the modeled values, existing values and trend line. If that looks sensible then click ‘Calculate’ If that looks good the click ‘Save modeled data’ (otherwise click ‘Clear’ or ‘Cancel’).



Gap filling option 3: Surrogate

Enter the proxy value to use, select the years to use that value for, click Calculate. If that looks good, click ‘Save modeled data’.



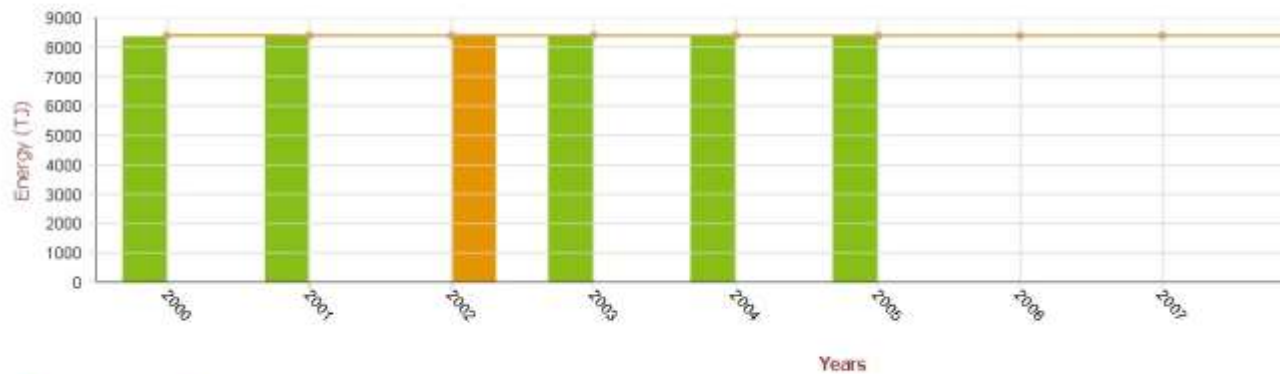
Gap filling option 4: Average value

Choose the years of data to use values from, view the modeled value, if it looks sensible, click 'Calculate' and if you're happy with that, click 'Save modeled data'.

Years range for analysis:

Existing data:

years:	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
 calculate average with:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 model these data:			<input type="checkbox"/>								
data series:	8,390.80	8,391.65	8,392.98	8,393.31	8,394.16	8,395.00	8,392.98	8,392.98	8,392.98	8,392.98	8,392.98



☒ MODELED ☒ EXISTING ☒ Trend line (Standard deviation = 1,56)

Calculate

Clear

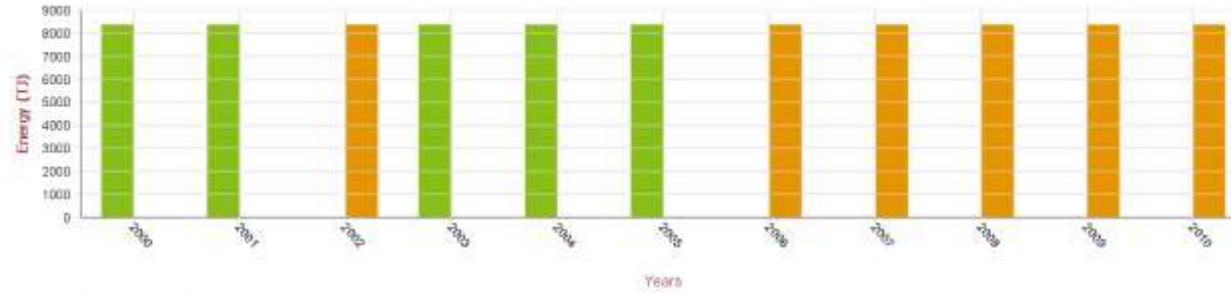
Cancel

Gap filing option 5: First value

Choose the years of data to use values from, view the modeled value, if it looks sensible, click 'Calculate' and if you're happy with that, click 'Save modeled data'.

Category: 1.A.4.b
 Model as Reference Approach: ☐
 Default fuel: not found
 Years range for analysis: 2000-2010
 Conservative Constant value:
 Existing data:

years:	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
data series:	8,390.80	8,391.65	8,392.00	8,393.31	8,394.16	8,395.00	8,392.00	8,392.00	8,392.00	8,392.00	8,392.00
model these data:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Legend: ☒ MODELED ☒ EXISTING

Fill modeled data details:
 2002 (8,392.00) ▾

Buttons: Calculate, Save modeled data, Clear, Cancel

11. Activity data analysis

Use the **Analytics** component for data analysis in SAGE.

This component enables users to perform basic data analyses over the AD collections that achieved the state **Published**. SAGE includes the following analysis modules:

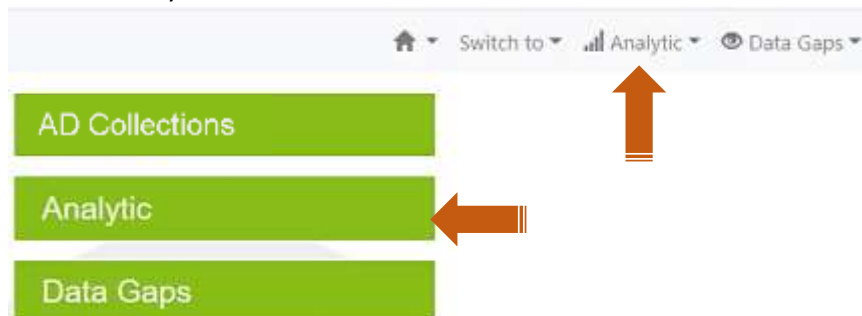
Shows:

- **Total values** total energy consumed as a result of combusting one, or more, or all, fuels from selected categories in a selected year.
- **Historical trend** time series for fuel consumption for selected categories, fuels, and years.
- **Rank by Category** energy in TJ used ranked by IPCC category for your chosen parameters. This is not applicable to the IPPU sector because its activity data are not recorded in the energy units and describe different types of products and processes.
- **Rank by Fuel** energy in TJ used ranked by fuel for your chosen parameters. As above, this option is applicable to the energy sector only because the data in the IPPU sector are not so uniform.
- **AD Change** IPCC categories as rows, and energy in TJ or the industrial product amount in the relevant units as values. If you select more than one year then this allows you to compare differences.

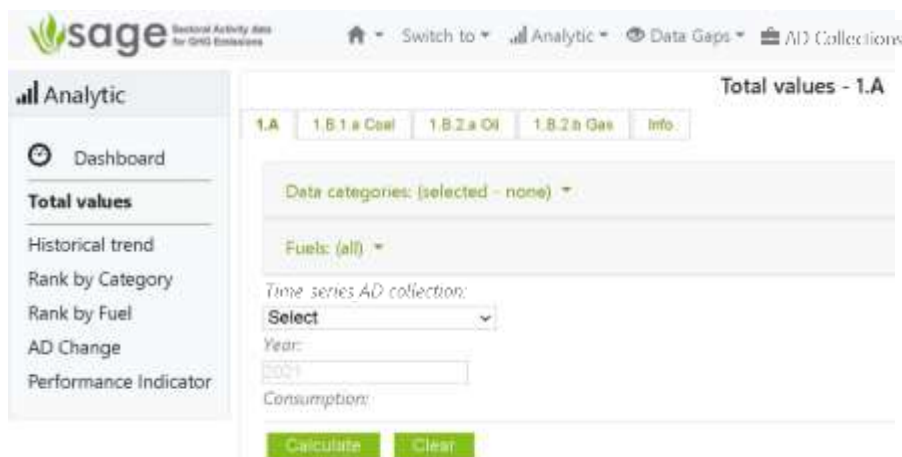
- **Performance Indicator** time series table of consumption (summed if required), by category, category-specific application (or fuel), AD collection, and by year(s).

11.1 How to calculate total fuel consumption

Step 1 click the Analytic link.



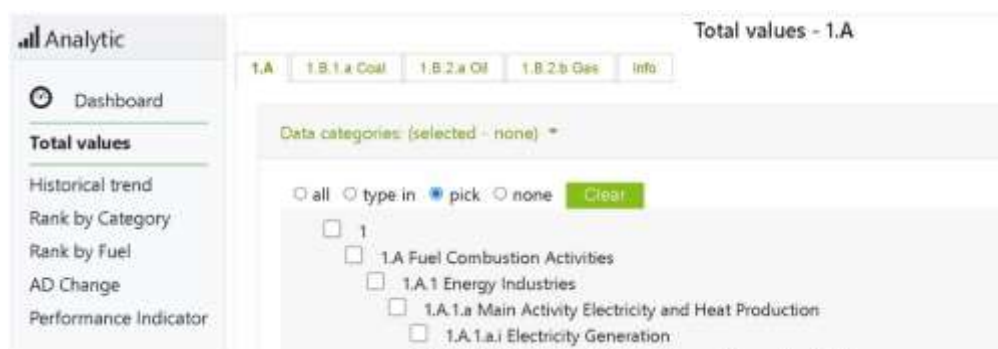
Step 2 click the list of available analyses links on the left to select **Total values**.



Step 3 click the list of categories to select one or more categories for the analysis. You can pick any combination of categories. If all categories are selected, each of them will be included in the summation table and the amount of energy consumption by each category will also be displayed.

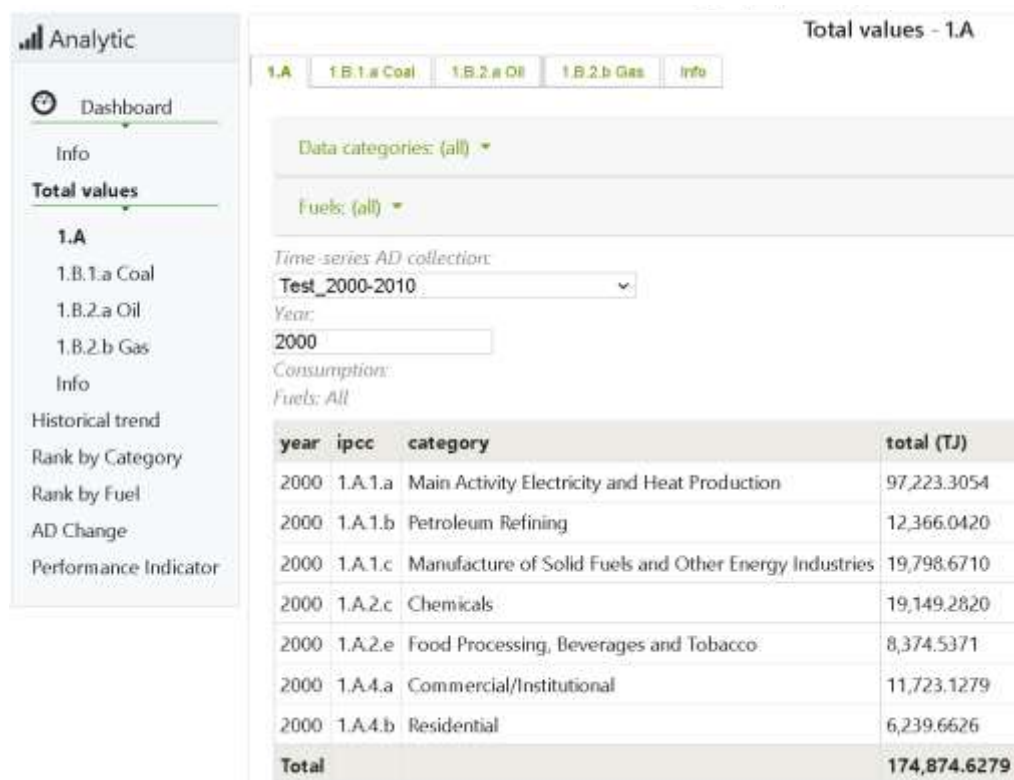
Below is a sample screenshot showing the 'category selection' screen.

Appendix E shows the complete list of categories that you can pick from.



Step 4 select a category-specific application (in this example - list of fuels to select one or more fuels; in **Figure 123** – all fuels are selected selected), then select the year

Figure 123. Selecting fuels for total energy consumption analysis



Step 5 Select AD collection, e.g., “Test_2000-2010”

Step 6 Select a year that is included within the AD collection name e.g., 2010

Step 7 Click **Calculate**

11.2 How to display historical trends

Step 1 click the **Analytic** link

Step 2 click **Historical trend** to select it as the chosen analysis type

1. Analytic

2. Historical trend

3. Data categories: (all)

4. Fuels: (all)

5. Test_2000-2010

6. 2000-2010

7. Calculate

Step 3 click the list of categories to select one or more categories for the analysis. You can pick one or more categories or select all categories. If all categories are selected, each

of them will be included in the summation table and the amount of energy consumption by each category will also be displayed.

Step 4 click the list of select a category-specific application (in this example - list of fuels to select one or more fuels, or all fuels to select one or more fuels, or all fuels), then select the time period for the time series. SAGE will show the available activity data in their energy value (TJ) or as an industrial product amount for selected AD collection, category, and the time period

Step 5 Select the AD collection to review

Step 6 Enter the year(s) to review if you need to

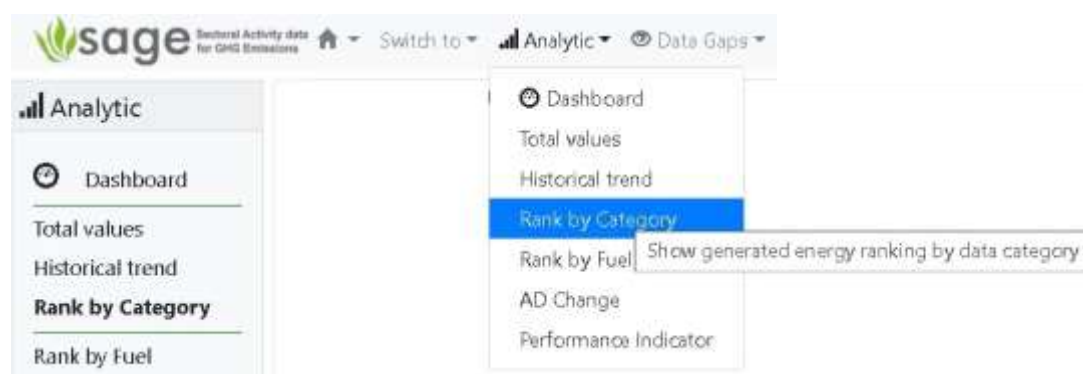
Step 7 Click Calculate, see **Figure 124**

Figure 124. Select analysis type (Historical trend is selected for all fuels in category 1.A.1 – Energy Industries)



11.3 How to 'Rank by Category' (for the Energy sector only)

Step 1 Click 'Analytic' link at the top of the page and then 'Rank by Category' menu item



'Rank by Category' form will display as below.

Rank by Category - 1.A

1.A [info](#)

Data categories: (all) ▾

Time series AD collection:
 Select ▾

Year:
 2021

[Calculate](#) [Clear](#)

Step 2 Select whichever data categories to include in analysis (see *Appendix E* for complete list)

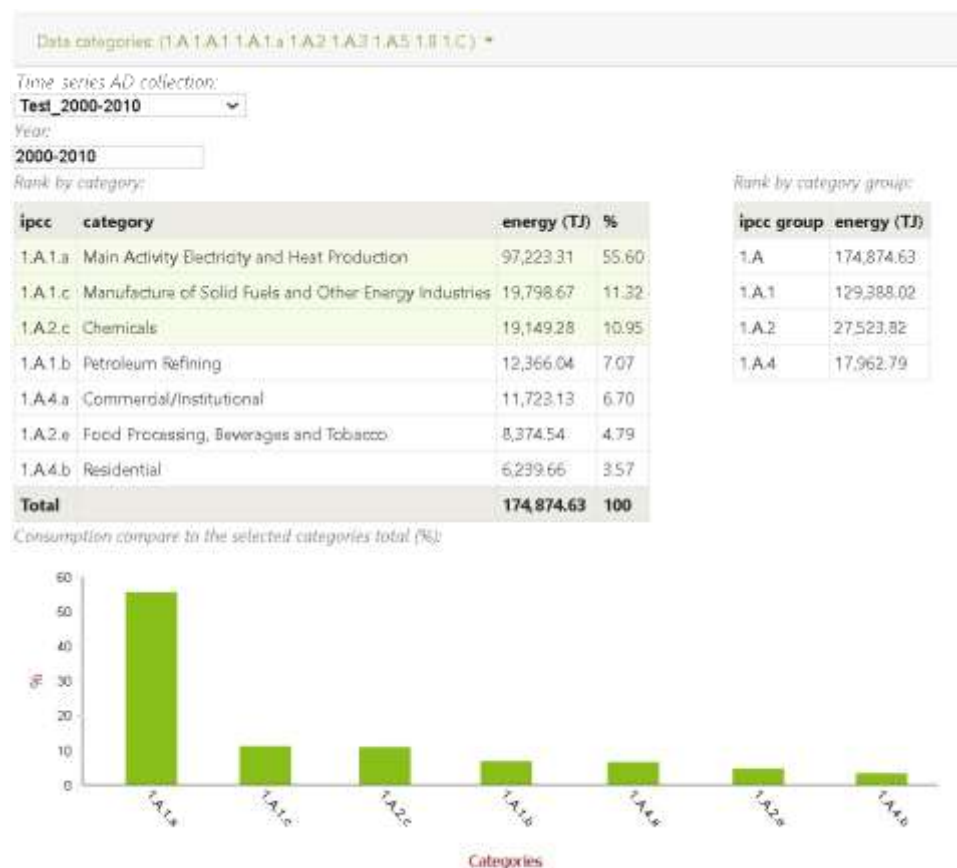
Step 3 Select the 'Activity data collection' to analyze

Step 4 Enter the year

Step 5 Click 'Calculate'

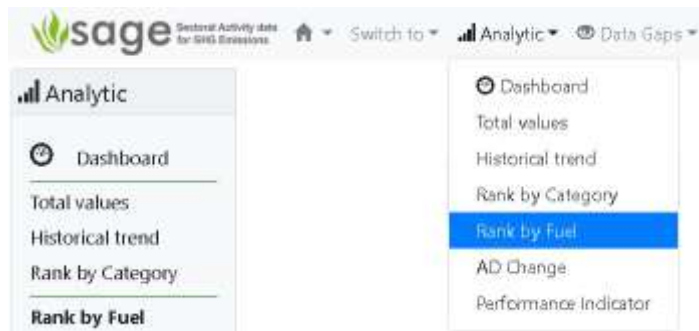
If it shows "no data found for current category selection" then try a different selection.

An example output follows:



11.4 How to 'Rank by Fuel' (for the Energy sector only)

Step 1 Click 'Analytic' link at the top of the page and then 'Rank by Fuel' menu item



'Rank by Fuel' form will display as below.



Step 2 Select whichever data categories to include in analysis (see *Appendix E* for complete list)

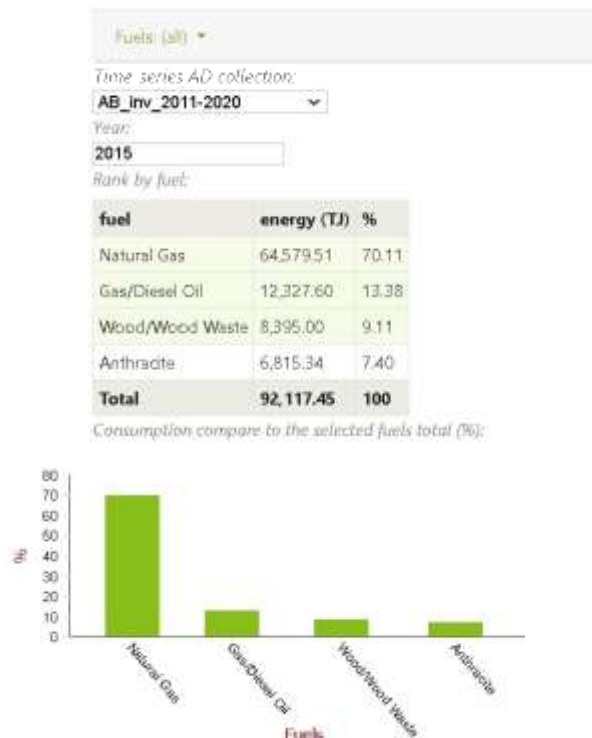
Step 3 Select the 'AD collection' to analyze

Step 4 Enter the year

Step 5 Click 'Calculate'

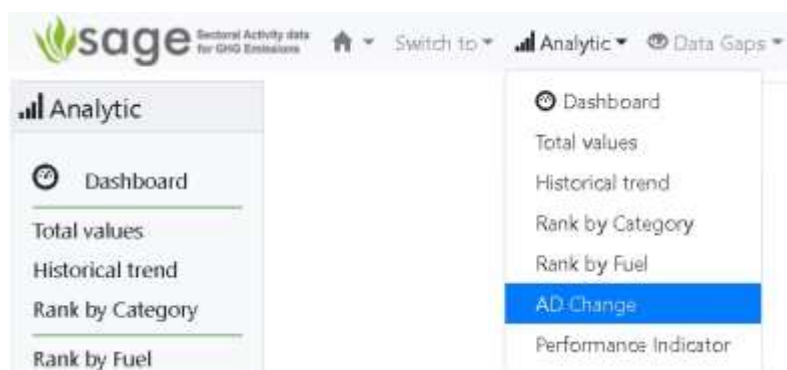
If it shows "no data found for current fuel selection" then try a different selection.

An example output follows:



11.5 How to analyze Activity Data Changes

Step 1 Click 'Analytic' link at the top of the page and then 'AD Change' menu item



'AD Change' form will display as below.

AD Change - 1.A

1.A: 1.B.1.a Coal 1.B.2.a Oil 1.B.2.b Gas Info

Data categories: (all) ▾

Fuels: (all) ▾

Time series AD collection:
Select ▾

Sum sub-categories:
☐

Years:
2015-2020

Step 2 Select whichever data categories to include in analysis (see *Appendix E* for complete list)

Step 3 Select the Activity data collection to analyze

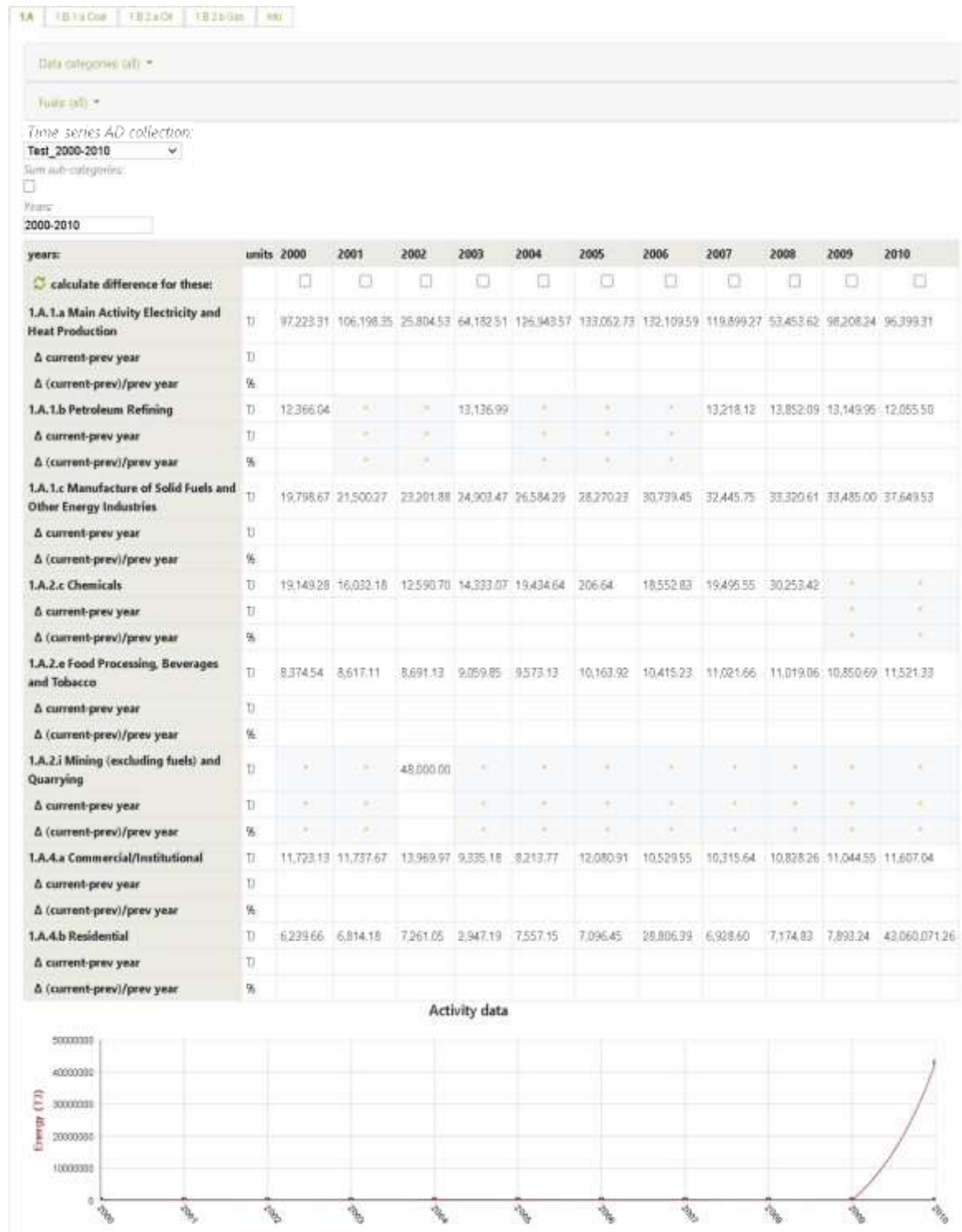
Step 4 Choose whether to sum sub-categories

Step 5 Enter the year

Step 6 Click 'Calculate'

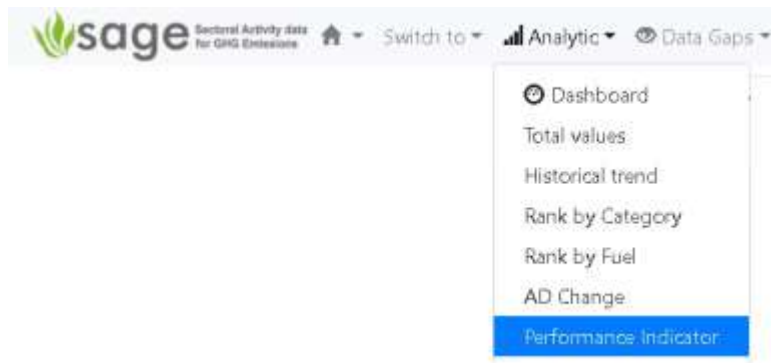
If it shows “no data found for current selection” then try a different selection.

An example output follows:



11.6 How to 'Performance Indicator'

Step 1 Click 'Analytic' link at the top of the page and then 'Performance Indicator' menu item



'Performance Indicator' form will display as below.



Step 2 Select whichever data categories to include in analysis (see *Appendix E* for complete list)

Step 3 For the Energy sector, also select whichever fuels or fuel categories to include in analysis

(see *Appendix H: Fuels* and/or *Appendix I: Fuel categories*)

Step 4 Select the 'Activity data AD collection' (AD collection) to analyze

Step 5 Choose whether to sum sub-categories

Step 6 Enter the year

Step 7 Enter a comparative data value if you want

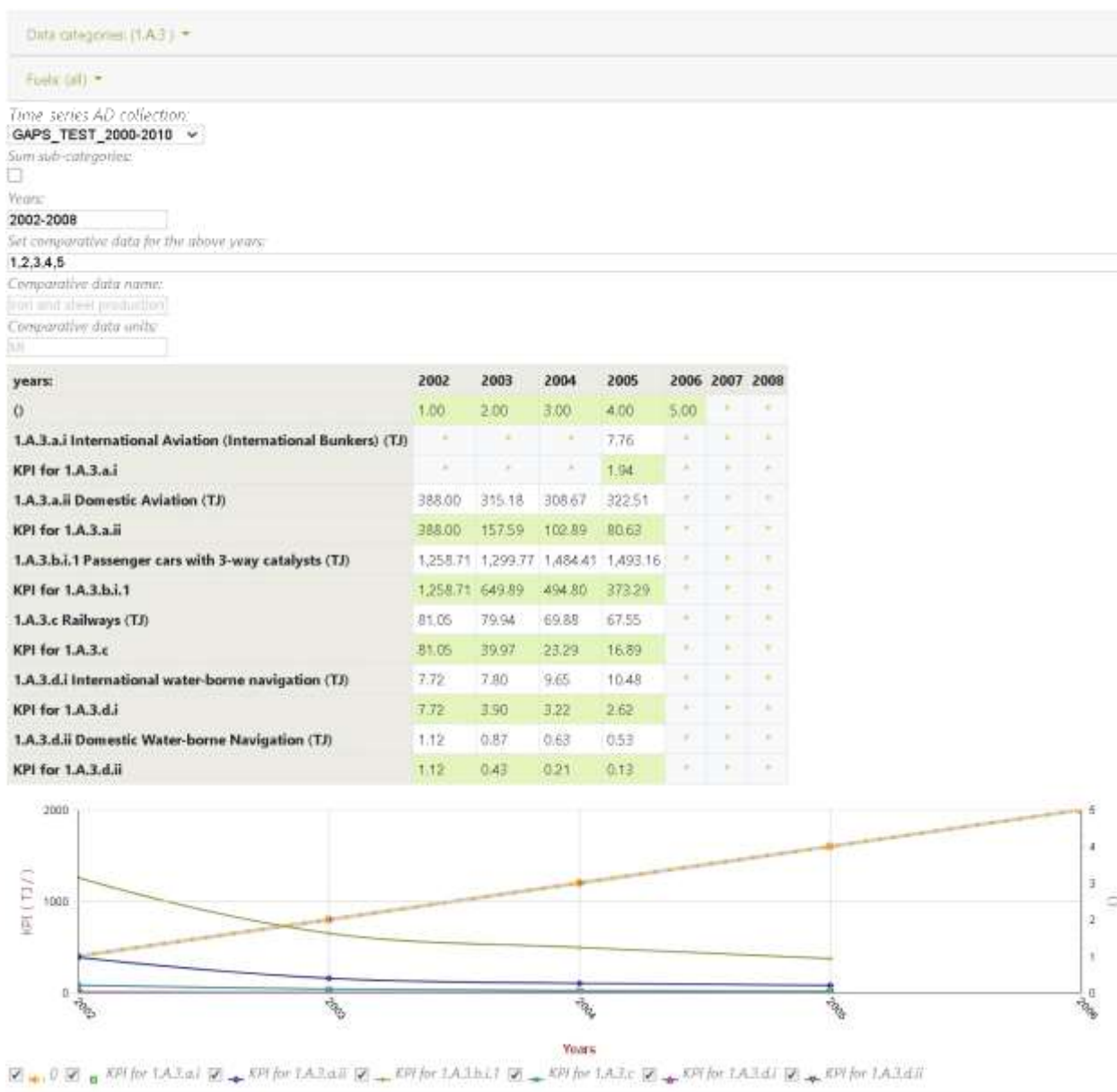
Step 8 Enter a comparative data name if you want

Step 9 Enter comparative data units if you want

Step 10 Click 'Calculate'

If it shows "no data found for current fuel selection" then try a different selection.

An example output follows:



12. Country-specific menu options and background data tables

12.1 Background

To configure background tables in SAGE, use **Configuration** component.

Only system administrator and technical users can access this component.

The **Configuration** component maintains and manages the core data sets for user selections. It has sections to configure basic and sectoral information. (It currently has three sections being 'basic', 'Energy' and 'IPPU'). The component is flexible and enables authorized users to customize the default selection options to reflect their country's national circumstances. Initially, SAGE provides a list of default options that are in-line with the 2006 IPCC Guidelines. However, each country is different and

some options might not be applicable to all and, thus, require adjustments. The following options are currently available for customization:

- Data aggregation levels
- Emission/removal source categories (2006 IPCC categories)
- Fuels (including such fuel characteristics as density, calorific values, Carbon content, and water content) Institutions - a very high-level indication of the source where the data are coming from
- Technologies - a list and description of technologies applied in the category or a sub-sector
- Units - a comprehensive list of units used for mass, volume, distance, energy, density, calorific values, carbon-content values. Each unit record includes calibrating coefficient to enable unit conversions to the metric units used in the IPCC equations.

In addition, authorized users can include and customize the instructional notes included in the component's information section to tailor them to the other users' needs. The records in the configuration tables could be added, modified, and deleted. They can be enabled or disabled on demand by the authorized users, which provides further flexibility in working with SAGE.

Another feature of this component is mapping between 2006 IPCC and UNFCCC category codes to enable an easy shift to the reporting under the ETF under the Paris Agreement. Figure 125 shows an example of the configuration table.

Figure 125. Configuration component – Units



The screenshot shows the 'Configuration' menu on the left and the 'Units - List' table on the right. The table has columns: id, name, symbol, description, base, base x, type, system, and status. It lists various units like barrel, BOE, billion cubic meters, British gallon, BTU, Btu(th)/pound, calorie, Celsius, centimetre, cubic centimeter, and cubic inch.

id	name	symbol	description	base	base x	type	system	status
93	barrel	B	volume	cubic metre	6.28981	volume	metric	enabled
88	barrel of oil equivalent (boe)	BOE	energy	joule	6118000000	energy	metric	enabled
119	billion cubic meters	10E9 m3	volume	cubic metre	1000000000	volume	metric	disabled
60	British gallon (=Imperial gallon)	BritG	volume	cubic metre	0.00454609	volume	metric	disabled
74	British thermal unit	BTU	energy	joule	1055	energy	metric	enabled
98	Btu(th)/pound	Btu(th)	mass per energy (e.g., carbon content)	kilogram per joule	2324.44	Carbon content	metric	disabled
66	calorie	cal	energy	joule	4.184	energy	metric	disabled
97	calorie per gram	cal/g	Energy content (calorific value)	joule per kilogram	4186.8	Calorific value	metric	disabled
94	Celsius	C	temperature	kelvin	1	temperature	metric	enabled
38	centimetre	cm	distance	metre	0.01	length	metric	enabled
34	cubic centimeter	cm3	volume	cubic metre	0.000001	volume	metric	enabled
63	cubic inch	in3	volume	cubic metre	0.0000164	volume	metric	disabled

12.2 How to manage Configuration tables

Step 1 click **Configuration** link using the global access menu across the top of the application screen (Figure 126).

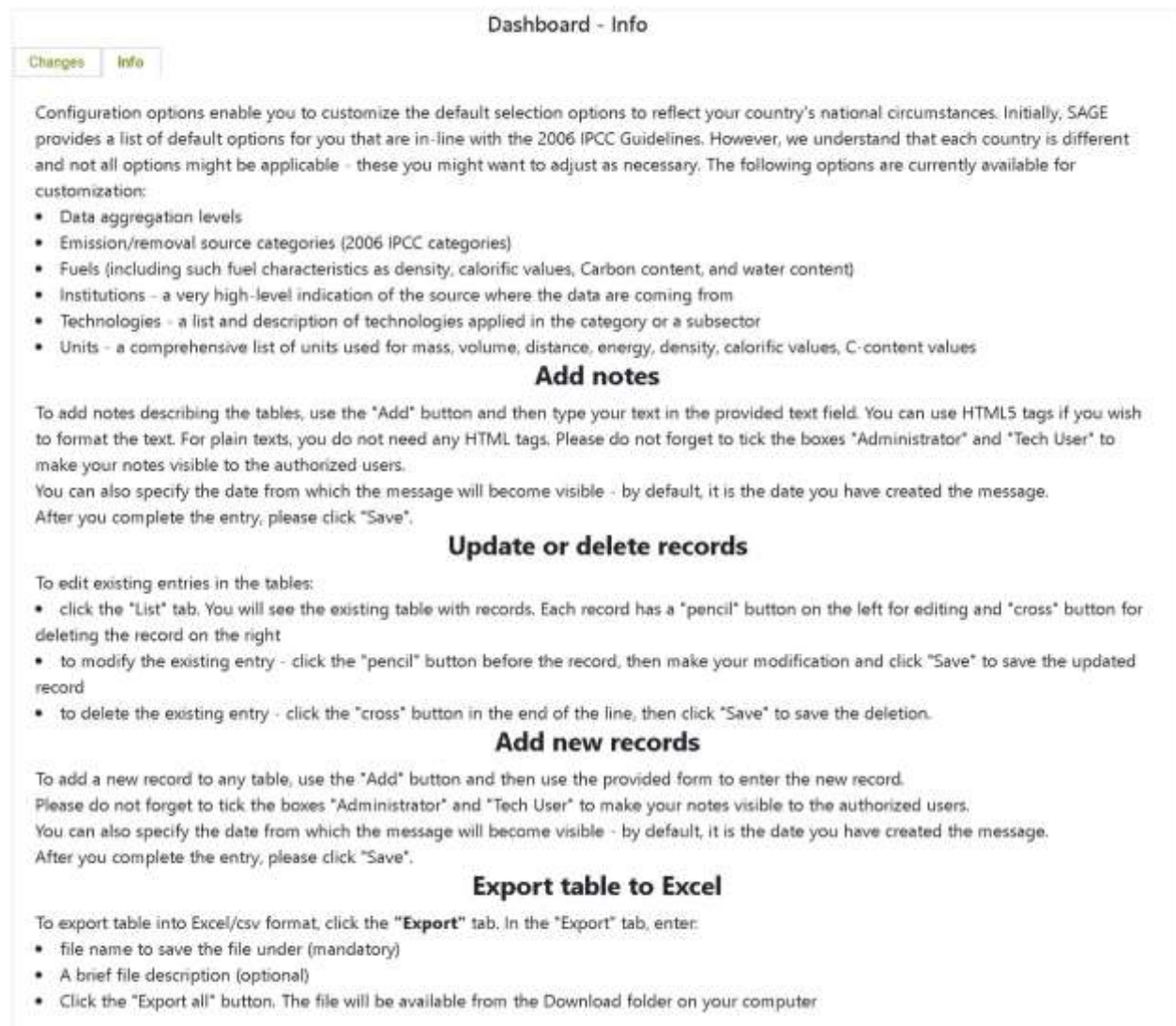
Figure 126. Accessing Configuration component





Step 2 Click **Dashboard** link and select tab Info to familiarize yourself with available options (Figure 127)

Figure 127. Accessing information notes on configuration options and instructions through the dashboard/Info links.



Dashboard - Info

Changes Info

Configuration options enable you to customize the default selection options to reflect your country's national circumstances. Initially, SAGE provides a list of default options for you that are in-line with the 2006 IPCC Guidelines. However, we understand that each country is different and not all options might be applicable - these you might want to adjust as necessary. The following options are currently available for customization:

- Data aggregation levels
- Emission/removal source categories (2006 IPCC categories)
- Fuels (including such fuel characteristics as density, calorific values, Carbon content, and water content)
- Institutions - a very high-level indication of the source where the data are coming from
- Technologies - a list and description of technologies applied in the category or a subsector
- Units - a comprehensive list of units used for mass, volume, distance, energy, density, calorific values, C-content values

Add notes

To add notes describing the tables, use the "Add" button and then type your text in the provided text field. You can use HTML5 tags if you wish to format the text. For plain texts, you do not need any HTML tags. Please do not forget to tick the boxes "Administrator" and "Tech User" to make your notes visible to the authorized users.

You can also specify the date from which the message will become visible - by default, it is the date you have created the message. After you complete the entry, please click "Save".

Update or delete records

To edit existing entries in the tables:

- click the "List" tab. You will see the existing table with records. Each record has a "pencil" button on the left for editing and "cross" button for deleting the record on the right
- to modify the existing entry - click the "pencil" button before the record, then make your modification and click "Save" to save the updated record
- to delete the existing entry - click the "cross" button in the end of the line, then click "Save" to save the deletion.

Add new records

To add a new record to any table, use the "Add" button and then use the provided form to enter the new record. Please do not forget to tick the boxes "Administrator" and "Tech User" to make your notes visible to the authorized users. You can also specify the date from which the message will become visible - by default, it is the date you have created the message. After you complete the entry, please click "Save".

Export table to Excel

To export table into Excel/csv format, click the "Export" tab. In the "Export" tab, enter:

- file name to save the file under (mandatory)
- A brief file description (optional)
- Click the "Export all" button. The file will be available from the Download folder on your computer

Step 3 Use local navigation panel on the left to click the link to the table you wish to edit (Figure 128).

Figure 128. Accessing the list of records in a configuration table (Aggregations table is displayed)





id	name	level	description
1	National	1	Data represents complete country figure
2	Regional	2	
4	North island	2	AD collected on the North Island
3	Facility	5	

The table management modules are similar to the AD collection tables (section 5 page 15).

Each module in the **Configuration** component includes the following control tabs:

- List** displays a table with the list of records; each record has a **pencil** icon at the beginning (this is the edit option) and a **cross** icon at the end (to delete a record),
- Add** allows new item creation (an AD collection, an AD collection record, or a record in a configuration table),
- Export** allows exporting existing items to an Excel (CSV) file,
- Import** allows importing data from an Excel (CSV) templates,
- Changes** contains a log of changes performed over the records within the module,
- Info** provides user guidance for each option in the module.

12.2.1 Edit or delete activity a data record

Click the **List** tab. You will see the existing table with records.

To edit existing configuration tables:

- Find the record you want to modify
- Click the **pencil** button at the left of the record you want to modify,
- make your modification using the form provided, and
- click **Save** to save the updated record.

To delete existing configuration tables:

- Click the **cross** icon at the right end of the record.

12.2.2 Add a new activity data record

The process of adding a new data record in the configuration table is similar to adding a new activity data record to the AD collection. To add a new data record, click **Add** and then use the provided form to create a new record. This will include entering both activity data and supporting information.

SAGE allows importing the entire data table for each configuration table from the Excel (CSV) file as well as using the entry form for ad-hoc entries.

Importing the data table from Excel

To import the entire table, you need to access the Import screen, get the import template, populate the data cells in the import table as required, save it on your computer, and then select and load the prepared table into SAGE (Figure 129 – Figure 131):

Step 1 Click Import tab to get to the table **Import** screen (Figure 129).

Step 2 Click **Get template** button to get the CSV template (Figure 130). The CSV template will be downloaded to your computer (most likely, you can find it in your folder **Downloads** or similar).

Step 3 Enter the data in the template (lines starting with # will be ignored by SAGE – you can safely delete them). Make sure that there are no gaps in the table. When you have entered the data on the table, save it as **CSV** file.

Step 4 In **SAGE**, click the **Choose File** button, navigate to the saved CSV file with the saved configuration table in the displayed file explorer window, then click Open. The file name will be displayed in the field near the Choose File button.

Figure 129. File import screen. Use the **Choose file** button to select the file for the upload (section Units is being uploaded in this example)

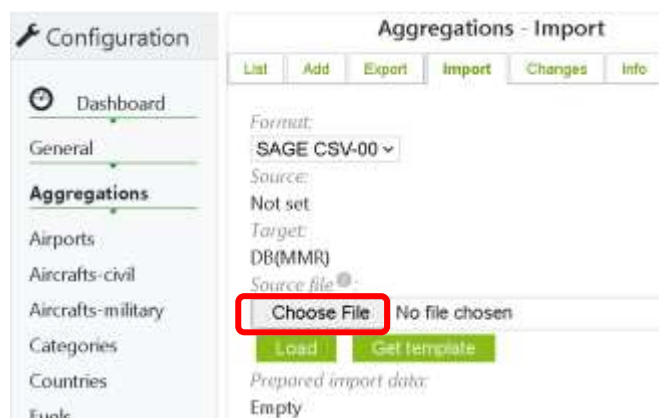
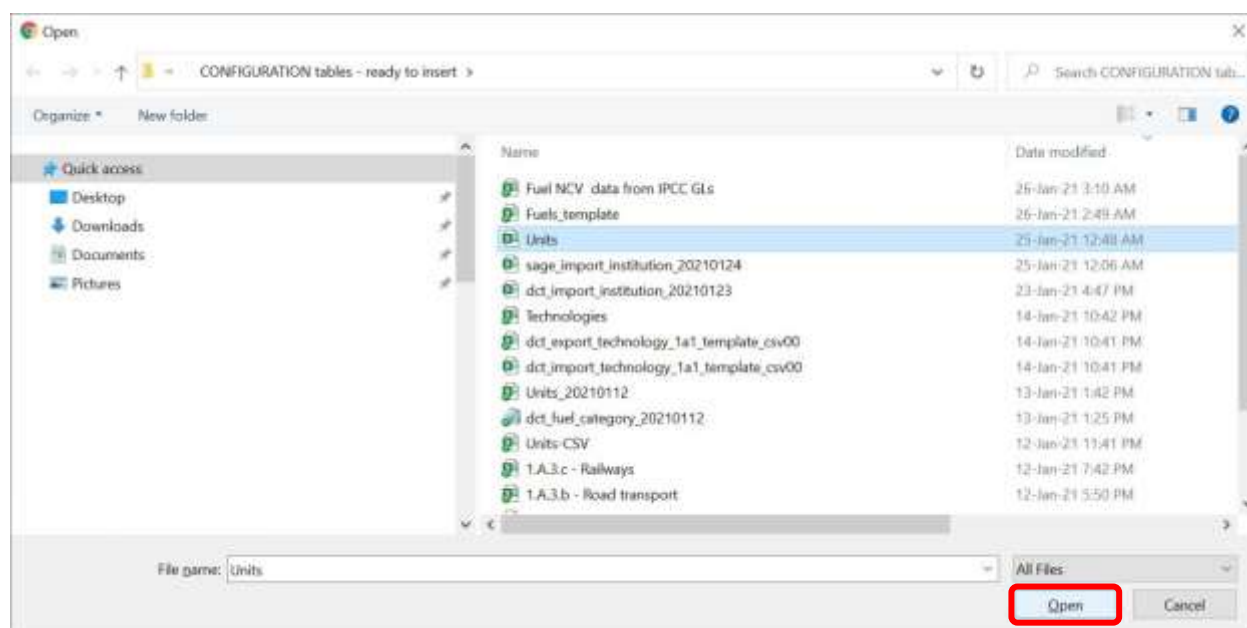
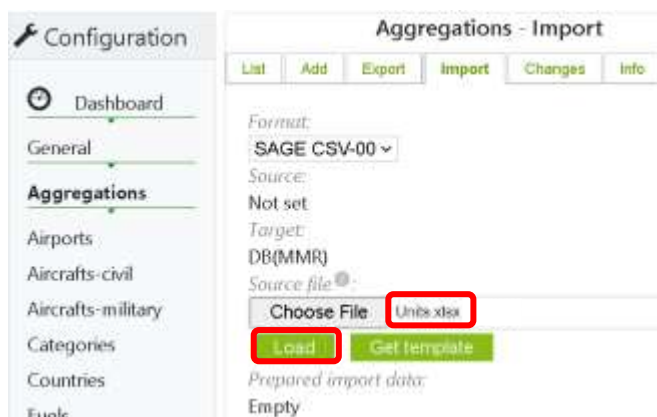


Figure 130. File import screen



Step 5 In **SAGE**, click the **Load** button. SAGE will upload the selected file to the configuration layer and will save it in the database.

Figure 131. Upload the selected file



12.2.3 Hide configuration table selections that are irrelevant to your country

You can hide a selection of a particular item from the configuration tables for your data entry personnel (for example, if your country only uses metric units then all imperial units are irrelevant to you). This is possible for all configuration tables except **Aggregations**.

Step 1 Go to the configuration component (see section 7.1 of this manual).

Step 2 Use local navigation panel on the left to click the link to the table you wish to edit. SAGE will display the list of records in the selected table (for example, table Units).

Step 3 In the displayed table, examine the column called Status. It allows you to enable or disable the record for viewing. Enabled records are visible as options in the unit selection menu and disabled records will not be visible. If you disable a record, it will still remain in the database and you will be able to enable it in the future, if necessary. SAGE advises to minimize the number of enabled. To disable a record (for example, a Barrel [B] **Figure 132**):

Step 3a type **barrel** in the search field in the column **name**, press **enter**. The record will be displayed

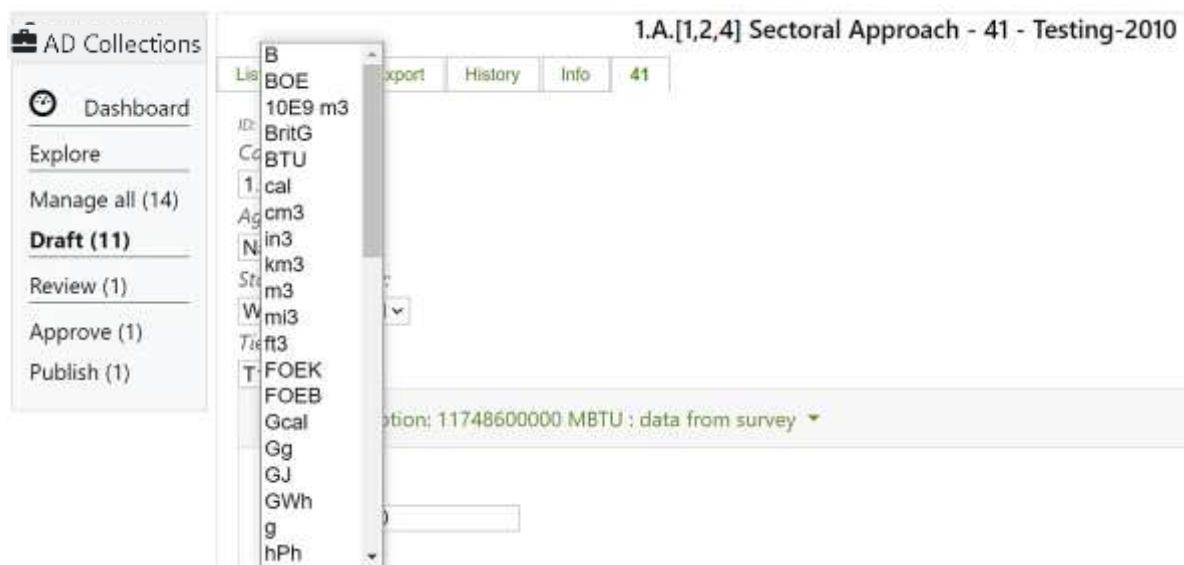
Step 3b click the editing icon (pencil) at the beginning of the record, SAGE will open the entry form,

Step 3c in the form, scroll down to the status **entry**, **Figure 133**

Step 3d select **disabled**, **Figure 134**

Step 3e **save** record. Now if you open the **Draft** component, open a record for editing and in the section **Fuel consumption** click menu **Units**, Barrel (B) option will not show. **Figure 135**

Figure 132. In the Draft component, fuel consumption section of the record, B (Barrel) is included in the



selection.

Figure 133. In the Configuration component, find the record B (Barrel) and use the pencil button for editing.

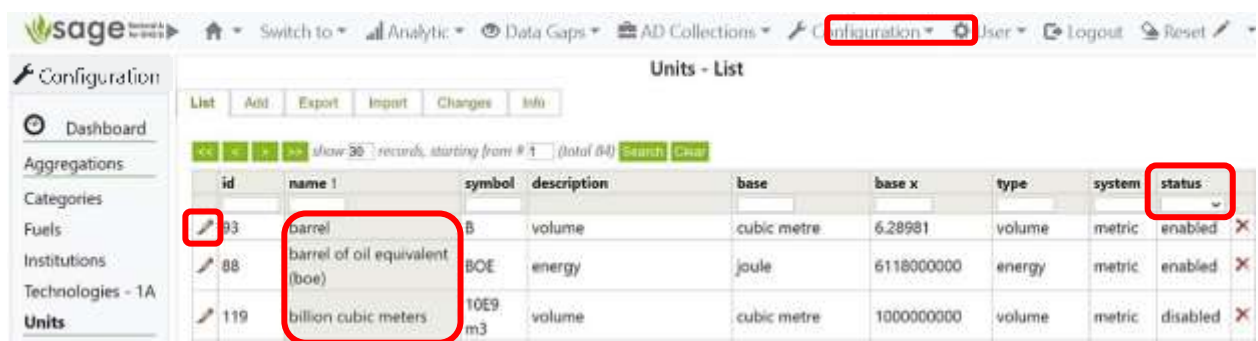


Figure 134. In the editing form, disable the unit Barrel and save the record

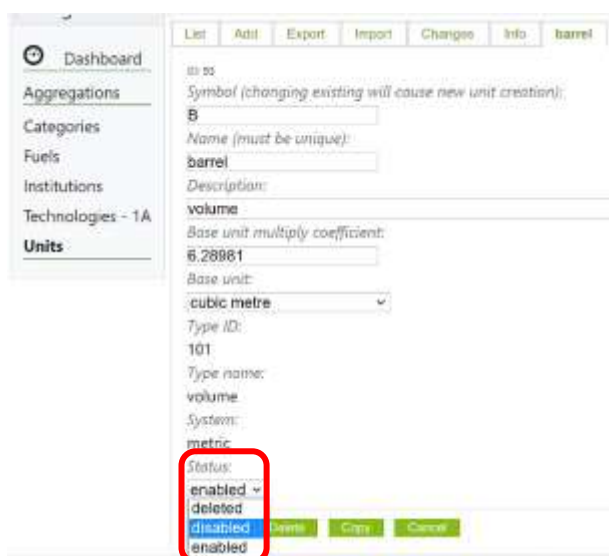
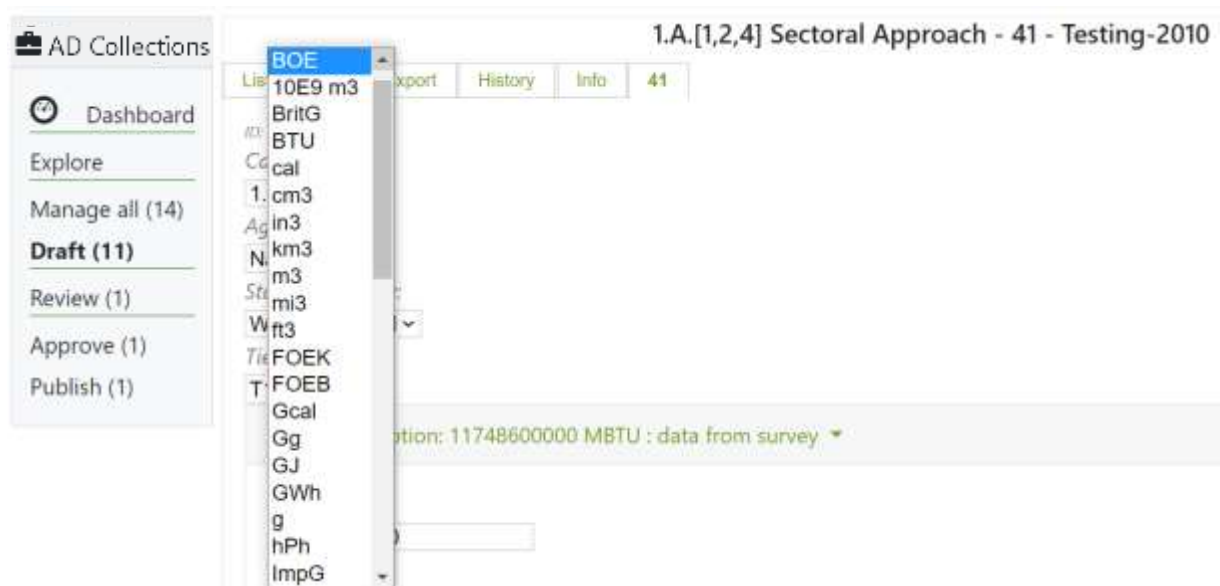


Figure 135. In the Draft component, fuel consumption section of the record, B (Barrel) is excluded from the selection



12.2.4 Configuration layer organization for the agriculture sector

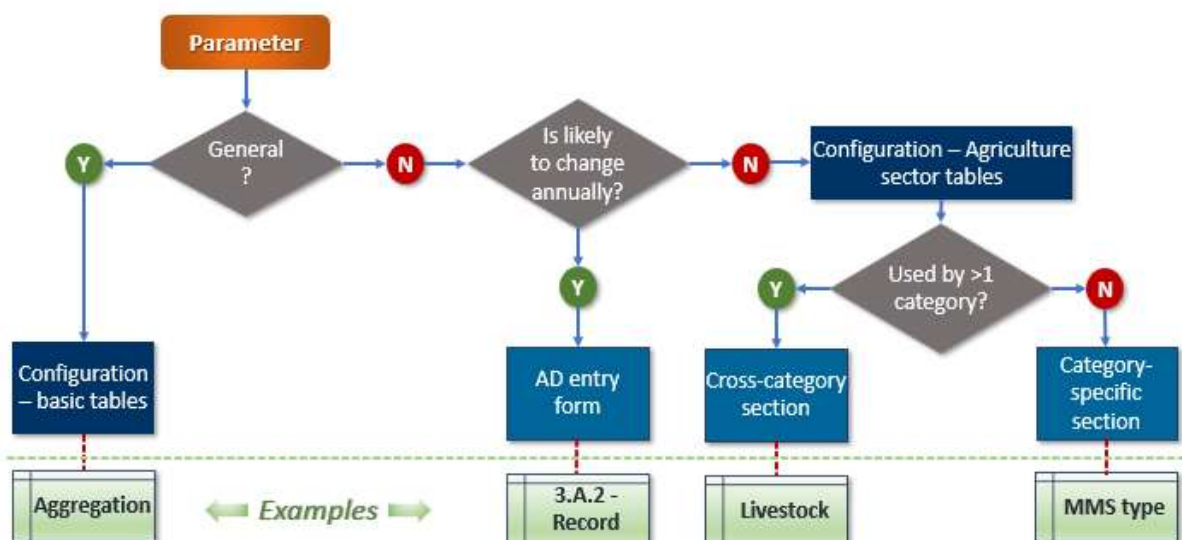
The agriculture sector has a high level of data complexity and inter-category dependencies. That is why there are some differences in the logic and organization of the configuration layer for the agriculture sector in SAGE from other sectors.

12.2.4.1 Addressing different frequencies of updates for the agriculture sector parameters

For each category in the agriculture sector, some parameters are not likely to change on an annual basis and others are expected to be changed from year to year. The parameters that are not likely to undergo an annual change are entered and stored in the **configuration tables**.

The entries in these tables should be made only by authorized technical experts or the inventory compiler. These entries will define the available selection options in the data entry forms, and the default parameters (from the 2006 IPCC Guidelines or country-specific) (**Figure 136**).

Figure 136. Distribution of parameters between the AD entry layer and the configuration in SAGE reflecting different frequencies of update



Configuration tables that are serving to multiple categories are grouped on the top of the configuration tables list. The tables mostly associated with one category (category-specific tables) are displayed below the cross-category tables. All category-specific configuration tables for the Ag sector are grouped by category or category family (e.g., configuration tables for 3.A.1 and 3.A.2 categories are grouped as 3.A).

For example, for 3.A category group in the cross-category portion of the Configuration – Agriculture sector of the Configuration layer, users need to adjust the following tables before entering the annual activity data in the cross-category section:

- Table **Livestock** leave only the relevant animal types to your country as “enabled” records; add new livestock types
- Table **Climate zones** – to ensure that only climate zones relevant to your country are entered or/and enabled and the parameters for the relevant climate zones are correct.

These tables are needed for ALL methodological tiers for 3.A category (T1, T2 simplified, T2 detailed)

In the category-specific configuration tables in the Configuration – Agriculture sector, the parameter entries depend on:

- The methodological tier (the higher the tier, the more parameters are required)
- The type of animal (e.g., some parameters required for dairy cows might differ from the parameters required for sheep, buffalo, and other animal types)

12.2.4.2 Separating entries for quantitative and qualitative parameters

The category-specific configuration parameter tables in SAGE are split into quantitative (i.e., with a numerical value) and qualitative (i.e., descriptive) (**Figure 138**):

- A typical structure of a descriptive table in SAGE includes a parameter name identifier, its code, name, and a description.
- For quantitative parameters, SAGE has two groups of tables:
 - “Parameter types” where the list and descriptions for each quantitative parameter entering the IPCC equations are included (**Figure 137**). These tables are fixed at the database level.

- The values of the quantitative parameters in SAGE are included in separate tables called “Calculated parameters” (**Figure 138**). These tables can be populated by technical users and superusers.

Figure 137. Separating entries for quantitative and qualitative parameters in SAGE

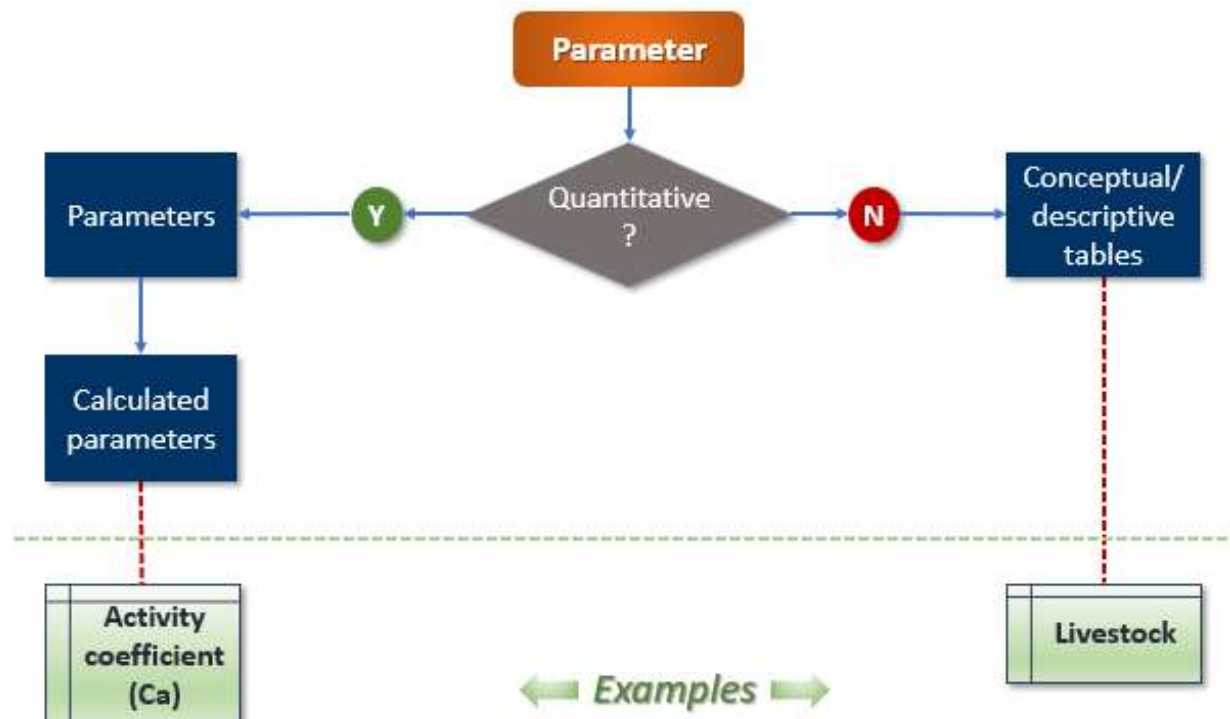


Figure 138. Example of Parameter types list in SAGE (3.A category)

id	code	name	variable name	units
5	activ-coef	Activity coefficient (MJ/day/kg)	Ca	number
103	n-excretion-year	Annual N excretion rate	Nex	kg
22	wool-prod	Average annual wool production per head		kg
12	birth-females	Birth females %		%
107	n-consumed-animal	Daily N consumed per animal	Nintake_spec	kg
102	n-excretion-day	Daily N excretion rate per animal weight (as kg N/1000kg animal)	Nrate	kg
104	n-retained	Daily N retained per animal	Nretention	kg
3	digest-energy	Digestible energy	DE	%
25	dry-matter-int	Dry matter intake	DMI	kg
28	dry-matter-int-tam	Dry matter intake percent of TAM	DMI_TAM	%

Figure 139. An example of calculation parameter entry form in SAGE (3.A category)

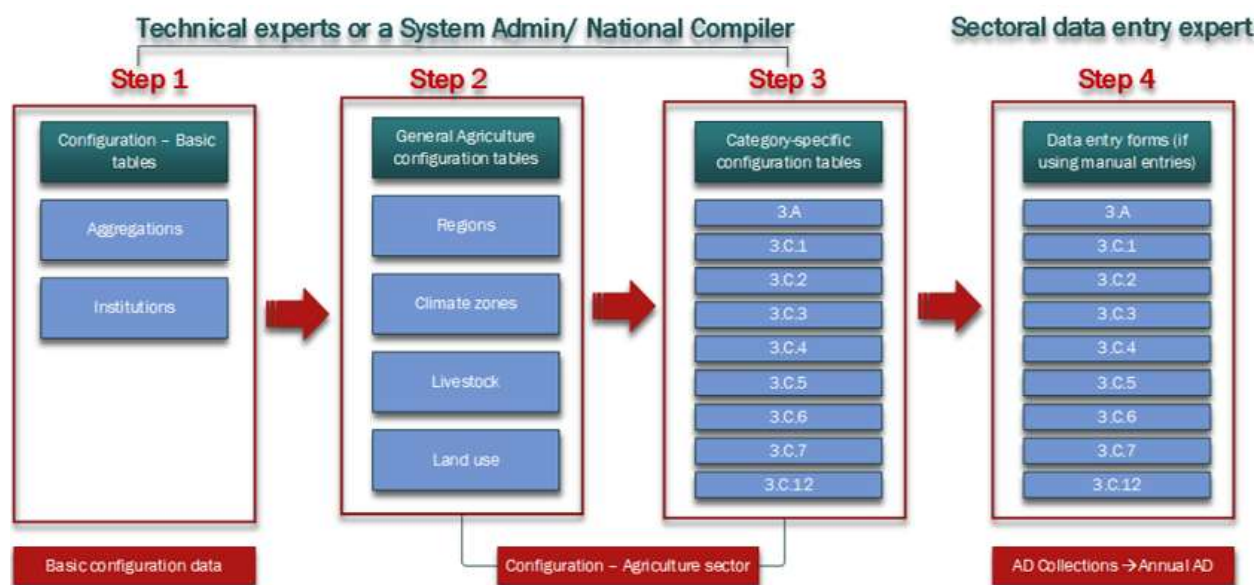
The example of the entry form (**Figure 143**) illustrates the flexibility of data entry allowing the selection of descriptive parameters to identify the situation, select the parameter type (e.g., annual excretion rate Nex), the value, the source, and the uncertainty of the parameter value.

To enable time-bounded entries and high-level values or disaggregated values, for some of the descriptive values the entry “Any” is allowed. For example, if a parameter does not depend on a climate zone or a feeding situation, then “Any” is an acceptable entry value for those descriptors. If for a particular setting of descriptors, users wish to have a very specific parameter’s value, this is also allowed. If in the second record for the parameter the descriptors will be set to a particular (not Any) value, when those conditions are true, the specified value of the parameter will be used. For example, typical animal mass could be different from year to year for the same animal type depending on the climatic changes (like draught), accessibility to feed, etc.

If a parameter is specific to only one IPCC livestock category or a methodological tier, these can be selected in the section “*Show parameter only for*”.

Figure 140 below shows a general order of filling the data tables and forms and the configuration tables and forms available at each step. The general configuration tables and the category-specific category tables need to be filled in and checked BEFORE the category entries are made in the relevant entry forms.

Figure 140. Recommended order of entries



12.2.4.3 Configuration table and parameter entries

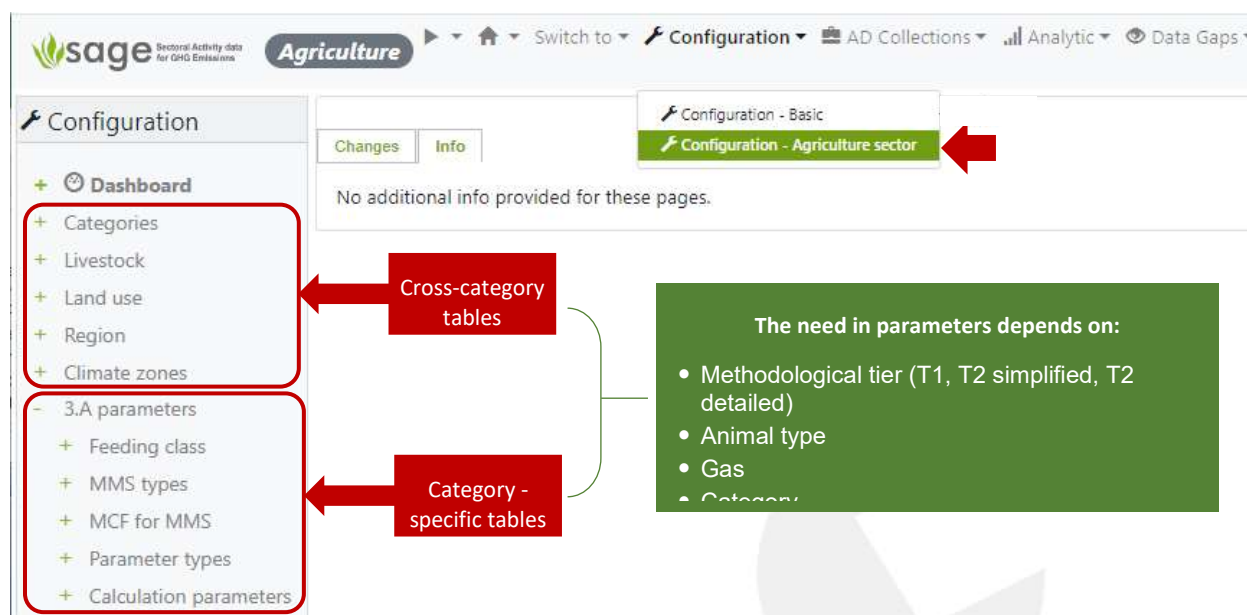
- Step 1: In the section **Configuration – Basic**, adjust the table Aggregations to ensure that only administrative/geographical subdivisions relevant to your country are entered and enabled (**Figure 141**). This is needed if the agriculture data are collected on a regional basis and the climate zones and animal types vary between the regions or if region-specific emission factors and parameters are available and planned for use in the inventory.

Figure 141. Getting to the Aggregations table



When finished – move to Steps 2 and 3 the Configuration – Agriculture sector (Figure 142)

Figure 142. Navigating to the Configuration – Agriculture sector tables



- **Step 2:** In the **cross-category** portion of the **Configuration – Agriculture sector** of the Configuration layer, adjust the following tables before entering the annual activity data in the cross-category section:
 - Table **Livestock** leave only the relevant animal types to your country as “enabled” records; add new livestock types (see section **12.2 How to manage Configuration tables** for details)
 - Table **Climate zones** – to ensure that only climate zones relevant to your country are entered or/and enabled and the parameters for the relevant climate zones are correct.

These tables are needed for ALL methodological tiers for 3.A category (T1, T2 simplified, T2 detailed)
- **Step 3:** In the **category-specific** configuration tables in the **Configuration – Agriculture sector**, the parameter entries depend on:
 - The **methodological tier** (the higher the tier, the more parameters are required)
 - The **type of animal** (e.g., some parameters required for dairy cows might differ from the parameters required for sheep, buffalo, and other animal types)

12.2.4.4 Configuration parameters that are required for category group 3.A

Category 3.A has the biggest variety of parameters required for methodological tiers by animal types. IPCC offers tier 1 (T1), tier 2 simplified (T2s), and tier 2 detailed (T2d) for these categories. In the IPCC software, Tiers 1 and 2s are available for all animal types. In the IPCC inventory software and in SAGE, T2d is available only for estimating emissions from dairy and non-dairy cattle, buffalo, and sheep. For all other animal types, the highest methodological tier provided by the 2006 IPCC GLs and the IPCC software is T2s.

This section presents the lists of required parameters for different methodological tiers and different animal types.

Note: because SAGE is the software for Activity data, **emission factors are out of scope for this tool and they are not listed in the tables below.** Also not listed the parameters that are obtained as a result of calculations from the listed parameters (e.g., NEa, NEm, NEp, NEI, etc.)

Tier 1: the following parameters are needed before entering data in the activity data entry form (Table 1):

Table 1. Parameters in the configuration layer are needed for categories 3.A.1 and 3.A.2 for tier 1.

For Tier 1			
Configuration table type	Parameter needed	Livestock Category	
		3.A.1 (Enteric fermentation)	3.A.2 (Manure Management)
Configuration - basic	Aggregation	needed	needed
Agriculture sector – cross-sectoral	Climate zone	needed	needed
	Livestock (type, optional – subdivision)	needed	needed
Agriculture category-specific	Typical animal mass (TAM)	needed	needed
	Number of days alive (DA)	needed	needed
	Manure Management system (MMS)	NOT needed	needed
	Daily N excretion rate per animal weight	NOT needed	needed

Note: all these parameters are already entered in SAGE, your task is to **check if they apply to your country, and adjust the values as needed, and/or delete/disable irrelevant records.**

For Tier 2, the IPCC offers 2 options – **simplified (T2s)** and **detailed (T2d)**.

Note:

- T2d for enteric fermentation is substantially different from T2s.
- Parameters required for T2d for enteric fermentation for dairy cattle, other cattle, buffalo, and sheep are quite different. This is because these types of animals have different age and economic use categorizations.
- T2d for manure management uses the same basic livestock parameters as T2d for enteric fermentation for each animal type. The general list of parameters specific to 3.A.2 only is very similar for simplified and detailed tiers. However, for T2d, IPCC offers equations that allow us to work out those parameters from scratch rather than using available defaults.

T2s: the following parameters are needed before entering data in the activity data entry form (Table 2,

Table 3):

Tier 2 simplified for 3.A.2 category (Manure management, all animal types)		
Configuration table type	Parameter needed	Are there options calculated/specified?
Configuration - basic	Aggregation	No
Agriculture sector – cross-sectoral	Climate zone	No
Agriculture sector – cross-sectoral	Livestock (type, subdivision, if available)	No
Agriculture category-specific	Typical animal mass (TAM)	No
	Number of days alive (DA)	No
	Digestible energy (DE)	Yes
	Manure Management system (MMS)	No
	Methane correction factor (MCF)	No
	Feeding class and diet	No
	Feeding situation	No
	Daily N excretion rate per animal weight	No
	Average daily milk production	No
	Fat content of milk	No
	Feed intake (dry matter, DMI)	Yes
	Energy density of feed	No
	Percent of protein in milk (PR%)	Yes
	Daily N consumed per animal	Yes
	Fraction of annual N retained by animal	Yes
	Crude protein in diet (CP%)	No
	Urinary energy fraction (UE)	No
	Feed ash content (ASH)	No

Table 2. Parameters in the configuration layer are needed for categories 3.A.1 for tier 2 simplified.

Tier 2 simplified for 3.A.1 category (Enteric fermentation, all animal types)	
Configuration table type	Parameter needed
Configuration - basic	Aggregation
Agriculture sector – cross-sectoral	Climate zone
Agriculture sector – cross-sectoral	Livestock (type, subdivision, if available)
Agriculture category-specific	Typical animal mass (TAM)
Agriculture category-specific	Number of days alive (DA) (default value, could be entered through the AD entry form)
	Digestible energy (DE)
	Dry matter feed intake (DMI)
	Energy density of feed
	Gross energy (if a country-specific value is available)

Table 3. Parameters in the configuration layer are needed for categories 3.A.2 for tier 2 simplified in addition to those in table 3.A.1 for T2s provided in table 2.

Configuration table type	Parameters to enter in the configuration tables
MMS types	Manure management system (S)
MCF to MMS	Methane conversion factor for MMS in geographical zone MCF(T,S)
Agriculture sector – cross-sectoral	Fraction of livestock category's manure handled using MMS in geographical zone (MS(T,S) – this is not entered in SAGE, but calculated after entries are done
Agriculture category-specific	Feeding class and diet
Agriculture category-specific	Feeding situation
Calculation parameters	Feed intake (DMI)
Calculation parameters	Energy density of feed (FED)
Calculation parameters	Urinary energy (UE)
Calculation parameters	Ash content of feed (ASH)
Calculation parameters	Volatile solid excretion per day (VS)
Calculation parameters	Maximum methane production capacity (Bo)

Calculation parameters	Milk protein content (PR%)
Calculation parameters	Crude protein in diet (CP%)
Calculation parameters	Daily N consumed per animal (Nintake)
Calculation parameters	Fat content of milk (%Fat) (for females)
Calculation parameters	Daily N retained per animal (Nretention)
Calculation parameters	Fraction of annual N retained by animal (Nretention(frac))
Calculation parameters	Annual N excretion rate (if specified as a country-specific number)
Calculation parameter	Estimated dietary net energy concentration of diet (NEma) (specified), other cattle only

T2d: the following parameters are needed before entering data in the activity data entry form (tables 4 – 10):

Enteric Fermentation – tier 2 detailed

Table 4. Parameters in the configuration layer are needed for categories 3.A.1 for tier 2 detailed – dairy cattle (= dairy cows).

Configuration table type	Parameters to enter in the configuration tables
Configuration - basic	Aggregation
Agriculture sector – cross-sectoral	Climate zone
Agriculture sector – cross-sectoral	Livestock (type, subdivision)
Agriculture category-specific	Typical animal mass (TAM)
	Number of days alive (DA)
	Activity coefficient (Ca)
	Average daily milk production
	Fat content of milk
	% of females that give birth in a year
	Coefficient for calculation NEp Energy for pregnancy (Cpregnancy)
	Digestible energy (DE%)
	Feeding class and diet
	Feeding situation
	Feed energy density
	Maintenance energy coefficient (Cfi)
	Switch to Cfi-cold temperature (Cfi_in cold)

Table 5. Parameters in the configuration layer are needed for categories 3.A.1 for tier 2 detailed – Other cattle (=Non-dairy cattle), Buffalo.

Tier 2 detailed for 3.A.1 category (Enteric fermentation, other cattle, buffalo)		
Configuration table type	Parameters to enter in the configuration tables	Applicability to specific animal subdivision
Configuration - basic	Aggregation	All
Agriculture sector – cross-sectoral	Climate zone	All
Agriculture sector – cross-sectoral	Livestock (type, subdivision)	All
Agriculture category-specific	Typical animal mass (TAM)	All
	Number of days alive (DA)	All
	Activity coefficient (Ca)	All
	Digestible energy (DE%)	All
	Feeding class and diet	All
	Feeding situation	All
	Feed energy density	All
	Maintenance energy coefficient (Cfi)	All
	Switch to Cfi-cold temperature (Cfi_in cold)	All (only for cold countries)
	Fat content of milk	Mature females only
	% of females that give birth in a year	Mature females only

	Coefficient for calculation Net Energy for pregnancy (Cpregnancy)	Mature females only
	Average daily milk production	Mature females only
	Average weight gain per day	Growing animals only
	Mature weight	For mature animals = TAM
	Average number of hours worked per day	Mature animals only
	Growth energy coefficient	Growing animals only

Table 6. Parameters in the configuration layer are needed for categories 3.A.1 for tier 2 detailed – Sheep.

Tier 2 detailed for 3.A.1 category (Enteric fermentation, sheep)			
Configuration table type	Parameters to enter in the configuration tables	IPCC variable name	Applicability to specific animal subdivision
Configuration - basic	Aggregation		All
Agriculture sector – cross-sectoral	Climate zone	Z	All
Agriculture sector – cross-sectoral	Livestock (type, subdivision)	T, Ts	All
Agriculture category-specific	Typical animal mass	TAM	All
	Number of days alive	DA	All (default value, could be entered through the AD entry form)
	Activity coefficient	Ca	All
	Digestible energy	DE%	All
	Feeding class and diet		All
	Feeding situation		All
	Feed energy density	FED	All
	Maintenance energy coefficient	Cfi	All
	Switch to Cfi-cold temperature	Cfi_in cold	All
	% of females that give birth in a year		Mature females only
	Coefficient for calculation Net Energy for pregnancy	Cpregnancy	Mature females only
	Average daily milk production		Mature females only
	En required to produce 1 kg of milk	EVmilk	Mature females only
	Fat content of milk	%Fat	Mature females only
	Average Annual wool per head		Mature sheep
	Energy value of each kg of wool produced	EVwool	All
	Weight gain of the lamb between birth and weaning	WGwean	Growing animals only
	Live body weight weaning	BWi	Growing animals only
	Live body weight at 1 year old or at slaughter if less than 1 year old	BWf	Growing animals only
	Const. 1 for calc. Net Energy for growth	a	Growing animals only
	Const. 2 for calc. Net Energy for growth	b	Growing animals only

Manure management – tier 2 detailed

For category 3.A.2 (Manure management) requires the above parameters to be set up in the configuration layer. For each livestock type, the parameters required for tier 2 detailed for 3.A.1 category should be entered first. The additional configuration parameters needed for 3.A.2 category at tier 2 detailed are presented in table 6 below. All these parameters should be entered in the category-specific section for 3.A.

Table 7. Parameters in the configuration layer are needed for categories 3.A.2 for tier 2 detailed (in addition to livestock parameters in T2d for 3.A.1)

Configuration table	Parameters to enter in the configuration tables	IPCC variable name	Animal type
MMS types	Manure Management System	S	All
MCF to MMS	Methane conversion factor for MMS in geographic zone	MCF(T,S)	All
Calculation parameters	Urinary Energy Fraction	UE	All
Calculation parameters	Ash content of feed calculated as a fraction	ASH	All
Calculation parameters	Volatile solid excretion per day on a dry-organic matter basis	VS	All
Calculation parameters	Crude protein in diet	%CP	Except sheep and buffalo
Calculation parameters	Daily N consumed per animal	Nintake	All
Calculation parameters	Milk protein content (= percent of protein in milk)	PR%	Cattle
Calculation parameters	Fat content of milk	%Fat	All (female)
Calculation parameters	Daily N retained per animal	Nretention	Cattle
Calculation parameters	Fraction of annual N retained by animal	Nretention(frac)	All
Calculation parameters	Annual N excretion rate (if specified as a country-specific number)	Nex	All
	Mx methane production capacity	Bo	All

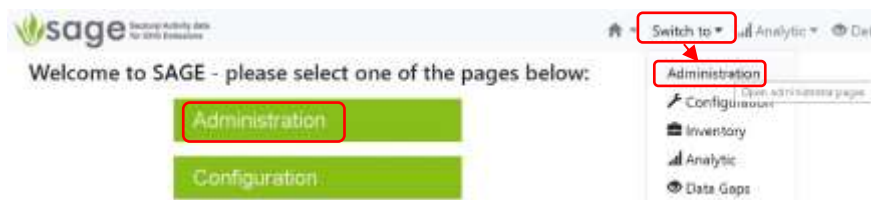
13. System administration

SAGE administration can be performed using the **Administration** component.

Only users with administrative rights have access to this component.

To access the administration component after logging in, click 'Administration'

Otherwise click 'Switch to' at the top and then 'Administration' or else on the front page, click:



The administrative component of SAGE includes a set of module controls for user management messaging, system logs and audits, system messaging and automatically performed system checks (Figure 143).

Figure 143. Administrative component modules (the User groups module is selected in this figure).

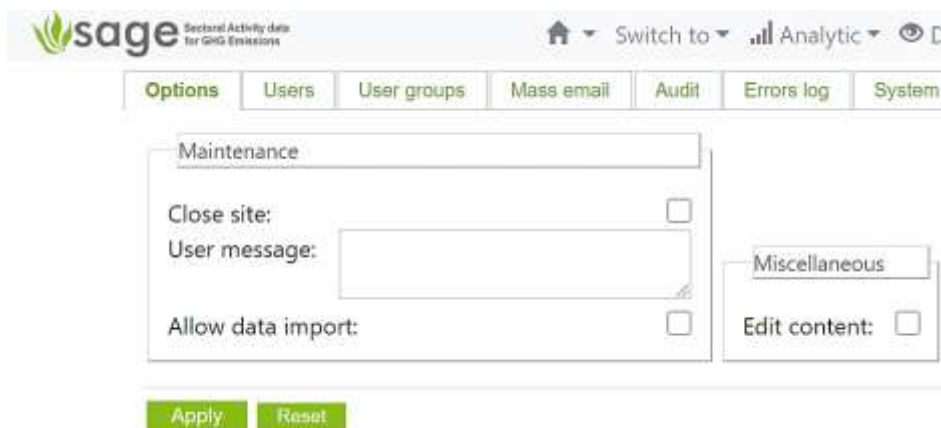


13.1 How to close/open the site for maintenance

A SAGE administrator can close the site for maintenance using the **Options** module (Figure 144) by checking the **Close site** box. SAGE advises to leave a message for users that will be displayed on the home page of the site. Use the **Apply** button to implement your choice. The site will be closed for all users except administrators.

To open the site again, log as administrator, go to the **Administration** component, select the **Options** module and **uncheck the Close site box**.

Figure 144. Options module – closing/opening SAGE site



13.2 How to manage users

To add new users, assign a user to a user group, edit user records, or delete a user, go to **Users** module of the **Administration** component (Figure 145).

Figure 145. Users module in SAGE



	status	user type	login name	first name	last name	organisation	email
<input type="checkbox"/>	enabled	Administrator				Any	
<input type="checkbox"/>	enabled	Administrator					
<input type="checkbox"/>	enabled	Administrator					
<input type="checkbox"/>	enabled	Administrator					
<input type="checkbox"/>	enabled	Administrator					
<input type="checkbox"/>	enabled	Contributor					
<input type="checkbox"/>	enabled	Contributor					
<input type="checkbox"/>	enabled	Tech User					

13.2.1 Add new user

In the **Users** tab, click the New button on the left of the screen. SAGE will display a user group entry form (**Figure 146**). Fill in the details and save the record. A new user record will be entered in the SAGE database and the e-mail will be sent to the user

Figure 146. Adding new user in SAGE

13.2.2 Edit new details

Editing user records is similar to the record editing procedure for the AD collection records or the table records in the configuration tables.

Step 1 In the **Users** tab, click the List button on the left of the screen. SAGE will display a list of users (Figure 145).

Step 2 Click the **pencil** at the beginning of the record you'd like to edit. SAGE will display the editing form. Adjust the group title, description and permissions as required (see the steps for editing contents in section 8.2.1 above).

Step 3 Save your selections by clicking on the **Save** button on the bottom of the screen.

13.2.3 Delete a user record

To delete a user record, click the **red cross** icon at the end of the record (**Figure 147**).

Figure 147. Deleting a user record

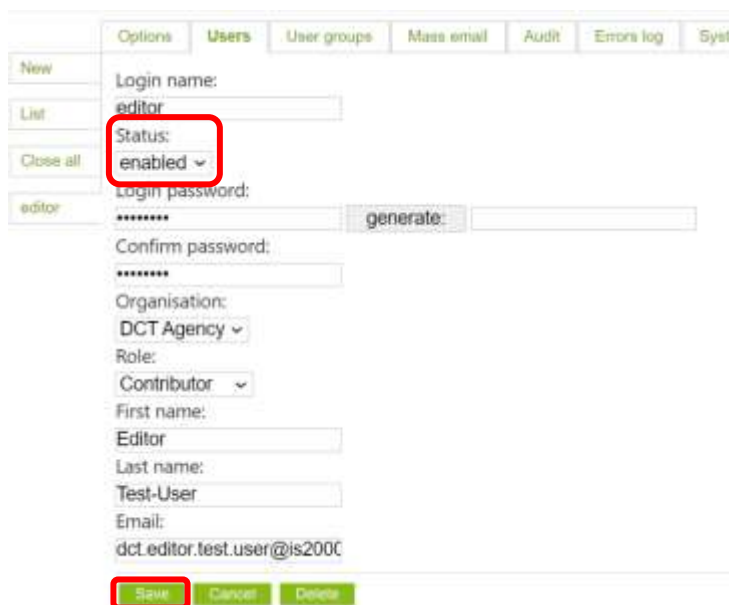
status	user type	login name	first name	last name	organisation	email	
enabled	Administrator						X
enabled	Administrator						X
enabled	Administrator						X
enabled	Administrator						X
enabled	Administrator						X
enabled	Contributor						X
enabled	Contributor						X
enabled	Tech User						X

13.2.4 Temporarily disable user access

SAGE lets you **disable the user access temporarily** without removing the user's record (Figure 148).

- Step 1** In the **Users** tab, click the List button on the left of the screen. SAGE will display a list of users (Figure 145).
- Step 2** Click the **pencil** at the beginning of the record you'd like to edit. SAGE will display the editing form. Adjust the group title, description and permissions as required (see the steps for editing contents in section 8.2.2 above).
- Step 3** In the user form, in the Status selection menu, select **disabled** and save the form. You can enable the user later following the same logical path.

Figure 148. How to disable or enable a user in SAGE without deleting the user record



The screenshot shows the 'Users' tab in the SAGE interface. The 'Status' dropdown menu is highlighted with a red box and shows 'enabled' with a downward arrow. The 'Save' button at the bottom is also highlighted with a red box. Other fields include Login name, Login password, Confirm password, Organisation (DCT Agency), Role (Contributor), First name, Last name, and Email.

13.3 How to manage user groups

To manage user groups, go to the **Administration** component, select the **User Groups** module. The list of available user groups will be displayed (Figure 149).

In line with the stakeholder analysis results, it is essential for the data and operational security to set up several groups of users with different access level. The following groups of roles and skills for different users have been identified:

- **Administrative users** that combine some information system knowledge combined with business knowledge and sufficient authority (for example, a national AD collection compiler or a national AD collection QC manager). These users should be able to perform the administrative system control, manage user accounts, and liaise with the SAGE support group regarding updates and upgrades. SAGE administrator will also be involved in the SAGE installation process and can assist the technical user in setting up the configuration tables. This group of users should be able to access all functional blocks and the administrative control block of SAGE.

- **Technical users** will have technical knowledge of the AD collection and AD collection processes (for example, national AD collection compilers, sectoral compilers, sectoral experts, and QC experts). They should be able to enter AD collection data, add and manage AD collections, perform data gap filling, do data analysis, and create reports. This group of users should be able to access all system functional components excluding the administrative control block.
- **Power users** are the people with more administrative than technical inclinations. For example, they can make a decision on the AD collection approval and sign-off, make some corrections at the data entry level, fill the gaps, and perform data analyses, but cannot configure the background data for the configuration component. For example, team managers or team leaders that manage the AD collection group could play this role.
- **Contributors** are the people performing data entry, gap filling and data analysis. These could be AD collection experts as well as people assisting in data entry process and performing basic data quality control. They should be able to access the **AD collection drafting**, **Data Gaps**, and **Analysis** components of SAGE as well as generate reports, but cannot access **AD collection management**, **Configuration** or **Administration** components.
- **Readers** are the people who can view the data in the published AD collections and perform data analysis over the approved AD collection data, for example policy analysts or AD collection negotiators. They should be able to access only AD collection published, and analysis components as well as generate reports.
- **Anonymous** are any other people without access account who are interested to view SAGE welcome page and the SAGE introduction video, e.g., general public. They will not have an access to any other SAGE facilities.

13.3.1 Add new user group

Step 1 In the User Groups tab, click the **New** button on the left of the screen. SAGE will display a user group entry form (Figure 149).

Figure 149. Adding new user group in SAGE

The screenshot shows the SAGE User Groups management interface. The 'User groups' tab is selected. On the left, the 'New' button is highlighted with a red box. The main form contains fields for 'Name' (set to 'New user group') and 'Description'. Below these is a 'Permissions' section with a 'Filter by module' dropdown menu, also highlighted with a red box. The permissions are listed in two columns: 'module_navigation' and 'module_permissions'. Each item has a set of three radio buttons for permissions.

Element	permissions (E.L.D)	Element	permissions (E.L.D)
module_navigation		module_permissions	
app	• ○ ○	app	• ○ ○
nav_site		controller	
ns_edit_content	○ ○ •	welcome	• ○ ○
ns_app_options	○ ○ •	user	○ ○ •
ns_user_options	○ • ○	options	○ ○ •
admin	○ ○ •	action	
nav_site		navigate-to	• ○ ○
ns_modules		index	○ ○ •
admin	○ ○ •	intro	○ ○ •
		error	○ ○ •
		login	• ○ ○

Step 2 Enter the name for the new group in the Name field and type the user group description to explain what the users of this group can and can't do.

Step 3 Set up the specific permissions for the users of this group for each module of SAGE. To switch between the modules, use **Filter by module** selection menu.

Step 4 For each element and module and each, select **one of the following**:

- E** Enabled
- I** Inherited
- D** Disabled

Step 5 Save your selections by clicking on the **Save** button on the bottom of the screen. You can also copy the entire set of permissions using the button **Copy** to save time if in some other group only few permissions will need to be modified.

13.3.2 Edit a user group

Editing user group records is similar to the record editing procedure for the AD collection records or the table records in the configuration tables.

Step 1 Click the **pencil** at the beginning of the record you'd like to edit. SAGE will display the editing form.

Step 2 Click the **pencil** at the beginning of the record you'd like to edit. SAGE will display the editing form. Adjust the group title, description and permissions as required (see the steps for editing contents in section 8.2.1 above).

Step 3 Save your selections by clicking on the **Save** button on the bottom of the screen. You can also copy the entire set of permissions using the button **Copy** to save time if in some other group only few permissions will need to be modified.

13.3.3 Delete a user group

To delete a user group, click the **red cross icon** at the end of the record (**Figure 150**).

Figure 150. Deleting a user group




The screenshot shows the SAGE application interface for managing user groups. The top navigation bar includes the SAGE logo and various menu items like 'Switch to', 'Analysis', 'Data Gaps', 'AD Collections', 'Configuration', 'User', 'Logout', and 'Reset'. Below the navigation bar, there's a 'User Groups' section with a table of user groups. The table has two columns: 'name' and 'description'. The 'Contributor' group is highlighted, and a red 'X' icon is visible at the end of its row, indicating the delete action.

name	description
Administrator	Full access to the application interface
Anonymous	Used not logged in users. Minimal access to the application functions
Contributor	Can read all collection data (draft, published, archived), add new and edit draft data series

13.4 Other administration menus

The remaining administration menus are hopefully quite obvious.

Mass email	Use this if you need to send a message to a number of SAGE users Use filters to trim the list, then click 'Message' to draft a message, then 'Send'
Audit	This shows an audit trail of actions and this list can be filtered Where there is a magnifying glass  , you can click that for more information
Errors log	This lists errors and details
System	This allows setting of directory write permissions, showing log data, system data and a list of currently active users
Blocked IPs	This shows a list of currently blocked Internet Protocol (IP) addresses
Custom text	This shows an editable list of custom text (in HTML text format)
Auto tasks	This shows a list of automated tasks
Auto tasks log	This shows the log of completed automated tasks
Source Track	This may show the source (depending on your permissions)

Appendix A: Acronyms

Acronym	Full text	Meaning
AD	Activity Data	This describes the information you are collecting and recording that measures the emission-causing activity
Bo	Maximum methane producing potential (or capacity)	The Bo is the maximum amount of methane that can be produced from a given quantity of organics (as expressed in BOD or COD) in the wastewater.
BOD	Biochemical oxygen demand	The BOD concentration indicates the amount of carbon that is aerobically biodegradable. The standard measurement for BOD is a 5-day test, denoted as BOD ₅ . This term is used in the 2006 IPCC Guidelines in relation to domestic wastewater.
CH ₄	Carbon tetrahydride	Chemical formula for methane
CO ₂	Carbon dioxide	Chemical formula for carbon dioxide
COD	Chemical oxygen demand	The COD measures the total material available for chemical oxidation (both biodegradable and non-biodegradable). This term is used in the 2006 IPCC Guidelines in relation to industrial wastewater.
CSV	Comma-separated values file	a delimited text file that uses a comma to separate values https://en.wikipedia.org/wiki/Comma-separated_values
EF	Emission Factor	Ultimately, the emission factor shows the amount of GHG produced per unit of activity data. This can be a simple parameter or a function of other parameters.
ETF	Enhanced transparency framework	The ETF specifies how Parties to the Paris Agreement must report on progress in climate change mitigation, adaptation measures and support provided or received. It also provides for international procedures for the review of the submitted reports. https://unfccc.int/news/understanding-the-enhanced-transparency-framework-new-handbook-published-0
Gg	Gigagrams	Mass measure 10 ⁶ kg (= 1 kt)

Acronym	Full text	Meaning
GHG	Greenhouse Gas	Any gas that causes increased heat reflection of heat that would otherwise have been radiated from Earth out to space
HFCs	Hydrofluorocarbons	A group of chemicals containing only carbon, fluorine, and hydrogen atoms in their molecules. They are used individually or within ozone depleting substitutes in refrigeration, air conditioning blends. They are also used as foam blowing agents, fire extinguishing, etc. HFCs are direct GHGs.
IPCC	Intergovernmental Panel for Climate Change	A team of people working between country governments to measure and address methods to reduce harmful changes to the environment of Earth
IPPU	Industrial Processes and Product Use	A GHG inventory sector concerned with GHG emissions from chemical processes and using solvents and other chemical products in industries and equipment use.
MCF	Methane correction factor	<p>This term is used for both solid waste disposal category and the wastewater treatment and discharge category.</p> <p>In terms of solid waste disposal, methane correction factor (MCF) is interpreted as the part of the waste that will decompose under aerobic conditions (prior to the conditions becoming anaerobic) in the solid waste disposal sites (SWDS)</p> <p>In terms of wastewater treatment and discharge, the MCF indicates the extent to which the CH₄ producing capacity (Bo) is realized in each type of treatment and discharge pathway and system. Thus, it is an indication of the degree to which the system is anaerobic. MCF is a component for calculation the emission factor for domestic wastewater treatment and discharge for a particular pathway or system.</p>
MSW	Municipal solid waste	Municipal Solid Waste (MSW)—more commonly known as trash or garbage—consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This

Acronym	Full text	Meaning
		comes from our homes, schools, hospitals, and businesses.
N ₂ O	Dinitrogen oxide	A chemical formula for nitrous oxide, a direct GHG.
PFCs	Perfluorocarbons	A group of chemicals containing only carbon and fluorine atoms in their molecules. They are used individually or within blends of ozone depleting substitutes. Also, PFCs can be released as a result of anode effect during aluminum production and magnesium production. PFCs are direct GHGs.
SAGE	Sectoral Activity data for GHG Emissions	This is the program you are using
St. Combustion	Stationary Combustion	Devices generally stay in one place and combust fuel
SWDS	Solid waste disposal site	Sites for disposal and treatment of municipal, industrial, and other solid wastes.
T1	Tier 1	See '6.1.3 How to add a new data record – manual entry' page 28 which discusses methodological tiers
T2	Tier 2	
T3	Tier 3	
TJ	Tera Joule	A measure of energy
TOW	Total organics in wastewater	Measures content of organic compounds in wastewater
UNFCCC	United Nations Framework Convention for Climate Change	The structure defined by a united group of world nations to measure, understand and manage changes to the environment

Appendix B: Examples of common data entry field values

Category for Stationary Combustion 1.A.[1,2,4,5]

- 1.A.1 - Energy Industries
 - 1.A.1.a - Main Activity Electricity and Heat Production
 - 1.A.1.a.i - Electricity Generation
 - 1.A.1.a.ii - Combined Heat and Power Generation (CHP)
 - 1.A.1.a.iii - Heat Plants
 - 1.A.1.b - Petroleum Refining
 - 1.A.1.c - Manufacture of Solid Fuels and Other Energy Industries
 - 1.A.1.c.i - Manufacture of Solid Fuels
 - 1.A.1.c.ii - Other Energy Industries
- 1.A.2 - Manufacturing Industries and Construction
 - 1.A.2.a - Iron and Steel
 - 1.A.2.b - Non-Ferrous Metals
 - 1.A.2.c - Chemicals
 - 1.A.2.d - Pulp, Paper and Print
 - 1.A.2.e - Food Processing, Beverages and Tobacco
 - 1.A.2.f - Non-Metallic Minerals
 - 1.A.2.g - Transport Equipment
 - 1.A.2.h - Machinery
 - 1.A.2.i - Mining (excluding fuels) and Quarrying
 - 1.A.2.j - Wood and wood products
 - 1.A.2.k - Construction
 - 1.A.2.l - Textile and Leather
 - 1.A.2.m - Non-specified Industry
- 1.A.4 - Other Sectors
 - 1.A.4.a - Commercial/Institutional
 - 1.A.4.b - Residential
 - 1.A.4.c - Agriculture/Forestry/Fishing/Fish Farms
- 1.A.5 - Non-Specified

Category for Transport 1.A.[3,5]

- 1.A.3.a.i - International Aviation (International Bunkers)
- 1.A.3.a.ii - Domestic Aviation

Aggregation

Airport	Oil field
Coal Basin	Province
Facility	Region A
Gas field	Region B
National	Regional
Oil and Gas Basin	State

Statistics quality

- Unknown
- Well developed

Tier

- T1
- T2
- T3

Airport Code (only a small subset is shown below to indicate format)

AAE - Algeria	ACV - USA	AHE - French Polynesia
AAL - Denmark	ACY - USA	AHN - USA
AAM - South Africa	ADA - Turkey	AHO - Italy
AAR - Denmark	ADB - Turkey	AIA - USA
ABE - USA	ADD - Ethiopia	AJA - France
ABI - USA	ADE - Yemen	AJR - Sweden
ABJ - Ivory Coast	ADF - Turkey	AKL - New Zealand
ABQ - USA	ADL - Australia	AKN - USA
ABR - USA	ADQ - USA	ALA - Kazakhstan
ABV - Nigeria	ADU - Iran	ALB - USA
ABX - Australia	ADZ - Colombia	ALC - Spain
ABY - USA	AES - Norway	ALF - Norway
ABZ - Scotland	AEX - USA	ALG - Algeria
ACA - Mexico	AGA - Morocco	ALL - Italy
ACC - Ghana	AGH - Sweden	All airports - Current country
ACE - Canary Islands	AGP - Spain	ALO - USA
ACH - Switzerland	AGS - USA	ALS - USA
ACK - USA	AGT - Paraguay	ALW - USA
ACT - USA	AGU - Mexico	ALY - Egypt

Note: if you are importing Airport codes then you must match exact text. For example, for Algeria, it must have "AAE - Algeria", that is, "AAE" space hyphen space "Algeria".

Fuel consumption – Value (simply enter a value for 'Value')

Fuel consumption - Units

Previously used

B
BOE
m3
kt
Mt
t
10E6 m3
TJ
MBTU
KTOE

cal
cm3
in3
km3
m3
Gg
GWh
g
ImpG
kg
KOE
kt
kWh
l
Lt
MTOE

Mt
MWh
t
10E6 m3
PJ
Lb
1015 BTU
st
TJ
105 BTU
1000US bbl oil
MBTU
10E3 m3
KTOE
TOE
USG
Wh

All units

B
BOE
10E9 m3
bbl
BritG

Fuel consumption - Type

NA	mod-expert
survey	mod-average
modeled	mod-first-val
mod-L-regr	

Fuel consumption – Source

2006 IPCC default	International organisation
Academic source	Invoice
Country-specific	Laboratory report
Customs	Modeled data
Direct measurements	National fuel statistics
Energy balance	Organisational report
Engineering website	Sub-national statistics
Expert judgement	Technical report
Facility specific	Technology report
ICAO	Technology specific
Industry report	UNFCCC
Industry specific	unknown

Fuel (type) (only a sample is shown)

Anthracite	Condensate API gravity from 50 to 80
Aviation Gasoline	Crude Oil
B20	Deep-cut extraction
B5	Dry gas
Biodiesels	E10
Biogasoline	E3
Biogasoline (=biopetrol)	E5
Bitumen API gravity <10	E85
Bitumen	Enhanced gas recovery
Blast Furnace Gas	ETBE11
Brown Coal Briquettes	ETBE22
Charcoal	Ethane
CNG (compressed natural gas)	ethanol
Coal Bed Methane	Gas Coke
Coal Tar	Gas Works Gas
Coke Oven Coke	Gas/Diesel Oil
Coke Oven Coke and Lignite Coke	Gasoline
Coke Oven Gas	Heavy crude oil API gravity between 10 and 22
Coking Coal	Heavy Diesel

Fuel density units

g/cm ³	lb/UKG
g/l	lb/USG
kg/m ³	ton/yd ³

Value type

survey	mod-expert
modeled	mod-average
mod-L-regr	mod-first-val
mod-surrogate	

Appendix C: Data Dictionary

Following is a small subset of the data dictionary.

Attribute name	Required data format	Optional (O) or Mandatory	Attribute description	Entry type	Example of data entry
irw_code	string (text)	M	AD collection for a particular year	Fully user-defined	My_AD_2020
ipcc_category	string (text)	M	The IPCC category code as per the configuration table (must be the same syntax)	As per the <i>Category</i> menu in the entry form or from the <i>Category</i> table among the configuration tables	1.A.3.a.1
ipcc_suffix	string (text)	O	Extension of the category name that is not specified in the main IPCC category	Fully user-defined	mB (for international military aviation in category 1.A.3.a.1)
tier	integer	M	IPCC methodological tier (T1, T2, T3)	As per the <i>Tier</i> menu in the entry form (it's sufficient to enter the tier number)	1
aggregation	string (text)	M	Level of data aggregation (national, regional, etc.)	As per the <i>Aggregation</i> menu in the entry form or from the <i>Aggregations</i> table among the configuration tables	National
stat_quality	string (text)	M	Statistics quality (1 is either well developed or not. If not well-developed, enter "unknown")	As per the <i>Statistics</i> quality menu	Unknown
fuel_name	string (text)	M	Name of fuel	As per the <i>Fuel</i> menu in the entry form or from the <i>Fuels</i> table among the configuration tables, column <i>Name</i>	Anthracite
fuel_name_local	string (text)	O	Additional, more name for the fuel, like "Texas oil" to provide fuel name specific for a region, oil field, etc.	Fully user-defined, max 30 characters	Texas oil
cal_type_name	string (text)	O	Calorific value type - GCV or NCV	Enter either GCV or NCV	NCV
airport_code	string (text)	M	3-letter airport code followed by the country name as: "XXX - country name" (do not forget to enter the spaces and the dash)	As per the <i>Airport code</i> menu in the entry form or from the <i>Airports</i> table among the configuration tables, columns <i>code</i> and <i>country</i>	AAE - Algeria
fuel_total_value	float	M	Total amount of fuel consumed	Fully user-defined	2500
fuel_total_units	string (text)	M	The units of measurement for fuel consumption (do not forget the space between the order of magnitude like 10E3 or 10E6 and the following unit symbol)	As per the <i>Units</i> menu options in the entry form or from the <i>Units</i> table among the configuration tables, column <i>symbol</i>	10E3 m3
fuel_total_issued_date	date	M	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25
fuel_total_source	string (text)	M	The source type for the fuel value (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table, column <i>name</i>	Direct measurements
fuel_total_reference	string (text)	M	A complete reference to the data source (e.g., website or the publication reference, or the report name) and any comments	Fully user-defined	https://www.stats.govt.nz/information-releases/new-zealand-energy-use-2018 These are provisional data, we will make corrections when the actual figures are available
fuel_total_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	modeled
density_value	float	O	Fuel density value	If not known, SAGE will use the default value from the <i>Fuels</i> table among the configuration tables (column <i>density</i>).	870
density_units	string (text)	O	Measurement units for density	As per the <i>Units</i> menu options in the entry form or from the <i>Units</i> table among the configuration tables, column <i>symbol</i>	kg/m3
density_issued_date	date	O	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25
density_source	string (text)	O	The source type for the density value (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table among the configuration tables, column <i>name</i>	Direct measurements
density_reference	string (text)	O	The detailed reference source of density value and any relevant comments	Fully user-defined	www.engineeringtoolbox.com/liquids-densities-d_743.html
density_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	survey
calorific_value	float	O	Calorific value	If not known, SAGE will use the default value from the <i>Fuels</i> table among the configuration tables (column <i>calvalue</i>).	44.3
calorific_units	string (text)	O	Measurement units for calorific value (also known as "heating value" in North America)	As per the <i>Units</i> menu options in the entry form or from the <i>Units</i> table, column <i>symbol</i>	1/Gg
calorific_issued_date	date	O	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25

carbon_source	string (text)	O	The source type for the carbon content value (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table among the configuration tables, column <i>name</i>	Direct measurements
carbon_reference	string (text)	O	The detailed reference source of carbon value and any relevant comments	Fully user-defined	www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
carbon_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	survey
water_value	float	O	Fuel density value	If not known, SAGE will use the default value from the <i>Fuels</i> table (if configured for the fuel).	15
water_units	string (text)	O	The units of measurement for water content (usually given as % of water in the fuel)	Enter %	%
water_issued_date	date	O	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25
water_source	string (text)	O	The source type for the water content value (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table, column <i>name</i>	Direct measurements
water_reference	string (text)	O	The detailed reference source of water value and any relevant comments	Fully user-defined	www.engineeringtoolbox.com/water-density-specific-weight-d_595.html
water_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	survey
uncert_1_value	float	O	Uncertainty value	If not known for the amount of fuel combusted, SAGE will calculate the uncertainty using the relevant algorithm from the 2006 IPCC Guidelines. For all other values, we strongly recommend to enter uncertainty data.	5
uncert_1_units	string (text)	O	The units of measurement for uncertainty (usually %, but could be absolute units - the same as the actual measurement)	If not %, enter the unit as per the <i>Units</i> menu options in the entry form or from the <i>Units</i> table among the configuration tables, column <i>symbol</i>	%
uncert_1_issued_date	date	O	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25
uncert_1_source	string (text)	O	The source type for the uncertainty value given as a single number (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table among the configuration tables, column <i>name</i>	Direct measurements
uncert_1_reference	string (text)	O	The detailed reference source of uncertainty value and any relevant comments	Fully user-defined	Industry Report XYZ
uncert_1_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	survey
uncert_2_value	float	O	Fuel density value	Fully user-defined. There is no need to enter uncertainty 2 value if uncertainty 1 is entered.	10
uncert_2_units	string (text)	O	The units of measurement for uncertainty (usually %, but could be absolute units - the same as the actual measurement)	If not %, enter the unit as per the <i>Units</i> menu options in the entry form or from the <i>Units</i> table among the configuration tables, column <i>symbol</i>	%
uncert_2_issued_date	date	O	When the data has been published (or the website last viewed)	Please use format YYYY-MM-DD	2020-01-25
uncert_2_source	string (text)	O	The source type for the uncertainty value given as a range or an asymmetric uncertainty (e.g., energy balance, national fuel statistics, etc.)	As as listed in <i>Source</i> menu options in the entry form or from the <i>Institutions</i> table among the configuration tables, column <i>name</i>	Direct measurements
uncert_2_reference	string (text)	O	The detailed reference source of uncertainty value and any relevant comments	Fully user-defined	Industry Report XYZ
uncert_2_type	string (text)	O	The type of data collection, e.g., survey, or modeled	Use one of the options listed in the <i>Type</i> menu in the entry form (with the exact syntax). If unknown, use NA	modeled
fuel_mass	float	N/A	amount of fuel recalculated to kt in SAGE	N/A	N/A
energy	float	N/A	amount of fuel in energy units, calculated in SAGE	N/A	N/A
state	string (text)	N/A	State of the inventory (draft, reviewed, approved, published)	N/A	N/A
inv_issue_code	string (text)	M	Annual AD collection name and year	User entry	RA_National_2000
inv_year	integer	M	Year of the annual AD collection	User entry	2000
gcv_to_ncv	float	M	Conversion coefficient between gross and net calorific values (.95 or .9)	User entry	0.95

Appendix D: Mapping import information and data structure – Energy Sector

When in SAGE, Aircraft Types shows a list in the following format:

Airbus A300, A306, AB4	Airbus A310, A310, 31X
Airbus A300, A306, AB6	Airbus A310, A310, 31Y
Airbus A300, A306, ABF	Airbus A319, A318, 318
Airbus A300, A306, ABX	Airbus A319, A319, 319
Airbus A300, A306, ABY	Airbus A320, A320, 320
Airbus A300, A306, AB3	Airbus A320, A320, 32S
Airbus A310, A310, 310	Airbus A321, A321, 321
Airbus A310, A310, 312	Airbus A330-200, A330, 330
Airbus A310, A310, 313	Airbus A330-200, A332, 332
Airbus A310, A310, 31F	

(To get there, in SAGE, click ► at the top, 'Energy' on the left, 'AD Collections' in the body, Edit annual AD (on the left), at the top ensure it says '1.A Reference appr. data', to the right of that, click and select '1.A.3.a T3', click Add at the top, and look for 'Aircraft code:' in the body of the page.)

Also, when setting up an import file, text in the format above is required.


The underlying data structure is presented in the table below (by going to SAGE, 'Configuration – Energy Sector', and selecting 'Aircrafts-civil').

id	plane class	generic type	ICAO	IATA	default fuel	fuel consumption (kg per LTO)	status	
							Any ▼	
162	Large Commercial Aircraft	Airbus A300	A308	AB3	Jet Kerosene	1720	enabled	✗
163	Large Commercial Aircraft	Airbus A300	A306	AB4	Jet Kerosene	1720	enabled	✗
164	Large Commercial Aircraft	Airbus A300	A306	AB6	Jet Kerosene	1720	enabled	✗
165	Large Commercial Aircraft	Airbus A300	A306	ABF	Jet Kerosene	1720	enabled	✗
166	Large Commercial Aircraft	Airbus A300	A306	ABX	Jet Kerosene	1720	enabled	✗
167	Large Commercial Aircraft	Airbus A300	A306	ABY	Jet Kerosene	1720	enabled	✗
168	Large Commercial Aircraft	Airbus A310	A310	310	Jet Kerosene	1510	enabled	✗
169	Large Commercial Aircraft	Airbus A310	A310	312	Jet Kerosene	1510	enabled	✗
170	Large Commercial Aircraft	Airbus A310	A310	313	Jet Kerosene	1510	enabled	✗
171	Large Commercial Aircraft	Airbus A310	A310	31F	Jet Kerosene	1510	enabled	✗
172	Large Commercial Aircraft	Airbus A310	A310	31X	Jet Kerosene	1510	enabled	✗
173	Large Commercial Aircraft	Airbus A310	A310	31Y	Jet Kerosene	1510	enabled	✗
174	Large Commercial Aircraft	Airbus A319	A319	319	Jet Kerosene	730	enabled	✗
175	Large Commercial Aircraft	Airbus A319	A318	318	Jet Kerosene	730	enabled	✗
176	Large Commercial Aircraft	Airbus A320	A320	320	Jet Kerosene	770	enabled	✗
177	Large Commercial Aircraft	Airbus A320	A320	32S	Jet Kerosene	770	enabled	✗
178	Large Commercial Aircraft	Airbus A321	A321	321	Jet Kerosene	960	enabled	✗
179	Large Commercial Aircraft	Airbus A330-200	A330	330	Jet Kerosene	2230	enabled	✗
180	Large Commercial Aircraft	Airbus A330-200	A332	332	Jet Kerosene	2230	enabled	✗
181	Large Commercial Aircraft	Airbus A330-300	A330	330	Jet Kerosene	2230	enabled	✗
182	Large Commercial Aircraft	Airbus A330-300	A333	333	Jet Kerosene	2230	enabled	✗
183	Large Commercial Aircraft	Airbus A340-200	A342	342	Jet Kerosene	1860	enabled	✗
184	Large Commercial Aircraft	Airbus A340-300	A340	340	Jet Kerosene	2020	enabled	✗
185	Large Commercial Aircraft	Airbus A340-300	A343	343	Jet Kerosene	2020	enabled	✗
186	Large Commercial Aircraft	Airbus A340-500	A345	345	Jet Kerosene	3370	enabled	✗
187	Large Commercial Aircraft	Airbus A340-600	A346	346	Jet Kerosene	3370	enabled	✗
188	Large Commercial Aircraft	Boeing 707	B703	703	Jet Kerosene	1860	enabled	✗
189	Large Commercial Aircraft	Boeing 707	B703	707	Jet Kerosene	1860	enabled	✗
190	Large Commercial Aircraft	Boeing 707	B703	70F	Jet Kerosene	1860	enabled	✗
191	Large Commercial Aircraft	Boeing 707	B703	70M	Jet Kerosene	1860	enabled	✗

Appendix E: Mapping import information and data structure – IPPU Sector

When in SAGE, Lime type shows a list in the following format:

Dolomitic lime large-scale production
Dolomitic lime small-scale production
High-calcium lime
Hydraulic lime

To get there, in SAGE, click  at the top, 'IPPU' on the left, 'AD Collections' in the body, Edit annual AD (on the left), at the top click tab '2.A', choose '2.A.2 T1' from the popup list, click Add at the top, and look for 'Lime type:' in the body of the page.

Also, when setting up an import file, text in the format above is required.

<input type="checkbox"/>	id	name	stoichiometric ratio	CaO range	CaO fract.	MgO range	MgO fract.	CaO-MgO fract.	status	
									Any ▼	
<input type="checkbox"/>	3	Dolomitic lime L-Prod	0.913	55-57	56	38-41	39.5	0.95	enabled	✗
<input type="checkbox"/>	4	Dolomitic lime S-Prod	0.913	55-57	56	38-41	39.5	0.85	enabled	✗
<input type="checkbox"/>	2	High-calcium lime	0.785	93-98	96	0.3-2.5	1.4	0.95	enabled	✗
<input type="checkbox"/>	5	Hydraulic lime	0.785	65-92	79		0	0.75	enabled	✗

Appendix F: Mapping import information and data structure – Waste Sector

When in SAGE, the discharge pathways show a list in the following format:

Constructed wetlands

- Horizontal subsurface flow
- Hybrid type
- Semi-natural treatment wetlands
- Surface flow
- Vertical subsurface flow

Other


- None
- Other

Treated

- Aerobic treatment plant
- Aerobic treatment plant, overloaded
- Anaerobic deep lagoon
- Anaerobic digester for sludge
- Centralized, aerobic treatment plant, overloaded
- Latrine, dry climate, low water
- Latrine, dry climate, low water, large commune
- Latrine, regular removal
- Latrine, wet climate
- Septic system

Untreated

- Flowing sewer (open or closed)
- Sea, river and lake discharge
- Stagnant sewer

To get there, in SAGE, click  at the top, 'Waste' on the left, 'AD Collections' in the body, Edit annual AD (on the left), at the top click tab '4.D', choose '4.D.1 T1,2' from the popup list, click Add at the top, and look for 'Discharge pathway:' in the body of the page.

Also, when setting up an import file, text in the format above is required.

The underlying data structure is presented in the table below (by going to SAGE, 'Configuration – Waste Sector', and selecting '4.D', '+', and then 'CH4' on the left).

	id	year	ipcc ?	aggregation	discharge system	pathway type	MFC	source	max CH4 prod. capacity
				avg					
<input type="checkbox"/>	2		4.D.1	National	Constructed wetlands	Vertical subsurface flow	0.0100	2006 IPCC default	0.6000
<input type="checkbox"/>	3		4.D.1	National	Treated	Centralized, aerobic treatment plant	0.0000	2006 IPCC default	0.6000
<input type="checkbox"/>	4		4.D.1	National	Treated	Anaerobic deep lagoon	0.8000	2006 IPCC default	0.6000
<input type="checkbox"/>	5		4.D.1	National	Treated	Anaerobic reactor	0.8000	2006 IPCC default	0.6000
<input type="checkbox"/>	6		4.D.1	National	Treated	Anaerobic digester for sludge	0.8000	2006 IPCC default	0.6000
<input type="checkbox"/>	7		4.D.1	National	Treated	Septic system	0.5000	2006 IPCC default	0.6000
<input type="checkbox"/>	8		4.D.1	National	Treated	Latrine, dry climate, low water	0.1000	2006 IPCC default	0.8000
<input type="checkbox"/>	9		4.D.1	National	Treated	Latrine, dry climate, low water, large commune	0.5000	2006 IPCC default	0.6000
<input type="checkbox"/>	10		4.D.1	National	Treated	Latrine, wet climate	0.7000	2006 IPCC default	0.8000
<input type="checkbox"/>	11		4.D.1	National	Treated	Latrine, regular removal	0.1000	2006 IPCC default	0.6000
<input type="checkbox"/>	12		4.D.1	National	Constructed wetlands	Horizontal subsurface flow	0.1000	2006 IPCC default	0.8000
<input type="checkbox"/>	13		4.D.1	National	Constructed wetlands	Semi-natural treatment wetlands	0.4000	2006 IPCC default	0.6000
<input type="checkbox"/>	14		4.D.1	National	Constructed wetlands	Hybrid type	0.2000	2006 IPCC default	0.6000
<input type="checkbox"/>	15		4.D.1	National	Constructed wetlands	Surface flow	0.4000	2006 IPCC default	0.6000
<input type="checkbox"/>	16		4.D.1	National	Untreated	Sea, river and lake discharge	0.1000	2006 IPCC default	0.6000
<input type="checkbox"/>	17		4.D.1	National	Treated	Anaerobic shallow lagoon	0.2000	2006 IPCC default	0.6000
<input type="checkbox"/>	27		4.D.1		Untreated	Flowing sewer (open or closed)	0.0000	2006 IPCC default	0.6000
<input type="checkbox"/>	28		4.D.1		Untreated	Stagnant sewer	0.5000	2006 IPCC default	0.6000
<input type="checkbox"/>	1		4.D.2	National	Treated	Anaerobic shallow lagoon	0.2000	2006 IPCC default	0.2500
<input type="checkbox"/>	18		4.D.2	National	Constructed wetlands	Vertical subsurface flow	0.0100	2006 IPCC default	0.2500
<input type="checkbox"/>	19		4.D.2	National	Treated	Centralized, aerobic treatment plant	0.0000	2006 IPCC default	0.2500
<input type="checkbox"/>	20		4.D.2	National	Treated	Anaerobic deep lagoon	0.8000	2006 IPCC default	0.2500
<input type="checkbox"/>	21		4.D.2	National	Treated	Anaerobic reactor	0.8000	2006 IPCC default	0.2500
<input type="checkbox"/>	22		4.D.2	National	Treated	Anaerobic digester for sludge	0.8000	2006 IPCC default	0.2500
<input type="checkbox"/>	23		4.D.2	National	Constructed wetlands	Horizontal subsurface flow	0.1000	2006 IPCC default	0.2500
<input type="checkbox"/>	24		4.D.2	National	Constructed wetlands	Semi-natural treatment wetlands	0.4000	2006 IPCC default	0.2500
<input type="checkbox"/>	25		4.D.2	National	Constructed wetlands	Hybrid type	0.2000	2006 IPCC default	0.2500
<input type="checkbox"/>	26		4.D.2	National	Constructed wetlands	Surface flow	0.4000	2006 IPCC default	0.2500

Appendix G: Example of Data Categories presentation in SAGE (the energy sector)

- ☐ 1
- ☐ 1.A Fuel Combustion Activities
 - ☐ 1.A.1 Energy Industries
 - ☐ 1.A.1.a Main Activity Electricity and Heat Production
 - ☐ 1.A.1.a.i Electricity Generation
 - ☐ 1.A.1.a.ii Combined Heat and Power Generation (CHP)
 - ☐ 1.A.1.a.iii Heat Plants
 - ☐ 1.A.1.b Petroleum Refining
 - ☐ 1.A.1.c Manufacture of Solid Fuels and Other Energy Industries
 - ☐ 1.A.1.c.i Manufacture of Solid Fuels
 - ☐ 1.A.1.c.ii Other Energy Industries
 - ☐ 1.A.2 Manufacturing Industries and Construction
 - ☐ 1.A.2.a Iron and Steel
 - ☐ 1.A.2.b Non-Ferrous Metals
 - ☐ 1.A.2.c Chemicals
 - ☐ 1.A.2.d Pulp, Paper and Print
 - ☐ 1.A.2.e Food Processing, Beverages and Tobacco
 - ☐ 1.A.2.f Non-Metallic Minerals
 - ☐ 1.A.2.g Transport Equipment
 - ☐ 1.A.2.h Machinery
 - ☐ 1.A.2.i Mining (excluding fuels) and Quarrying
 - ☐ 1.A.2.j Wood and wood products
 - ☐ 1.A.2.k Construction
 - ☐ 1.A.2.l Textile and Leather
 - ☐ 1.A.2.m Non-specified industry
 - ☐ 1.A.3 Transport
 - ☐ 1.A.3.a Civil Aviation
 - ☐ 1.A.3.a.i International Aviation (International Bunkers)
 - ☐ 1.A.3.a.ii/mil International Aviation (International Bunkers) Mil
 - ☐ 1.A.3.a.iii Domestic Aviation
 - ☐ 1.A.3.b Road Transportation
 - ☐ 1.A.3.b.i Cars
 - ☐ 1.A.3.b.i.1 Passenger cars with 3-way catalysts
 - ☐ 1.A.3.b.i.2 Passenger cars without 3-way catalysts
 - ☐ 1.A.3.b.ii Light-duty trucks
 - ☐ 1.A.3.b.iii Heavy-duty trucks and buses
 - ☐ 1.A.3.b.iv Motorcycles
 - ☐ 1.A.3.b.v Evaporative emissions from vehicles
 - ☐ 1.A.3.b.vi Urea-based catalysts
 - ☐ 1.A.3.c Railways
 - ☐ 1.A.3.d Water-borne Navigation
 - ☐ 1.A.3.d.i International water-borne navigation
 - ☐ 1.A.3.d.ii Domestic Water-borne Navigation
 - ☐ 1.A.3.e Other Transportation
 - ☐ 1.A.3.e.i Pipeline Transport
 - ☐ 1.A.3.e.ii Off-road
 - ☐ 1.A.4 Other Sectors
 - ☐ 1.A.4.a Commercial/Institutional
 - ☐ 1.A.4.b Residential
 - ☐ 1.A.4.c Agriculture/Forestry/Fishing/Fish Farms
 - ☐ 1.A.5 Non-Specified
 - ☐ 1.A.5.a Stationary
 - ☐ 1.A.5.b Mobile
 - ☐ 1.A.5.b.i Mobile (aviation component)
 - ☐ 1.A.5.b.ii Mobile (water-borne component)
 - ☐ 1.A.5.b.iii Mobile (Other)
 - ☐ 1.A.5.c Multilateral Operations
- ☐ 1.B Fugitive emissions from fuels
 - ☐ 1.B.1 Solid Fuels
 - ☐ 1.B.1.a Coal mining and handling
 - ☐ 1.B.1.a.i Underground mines
 - ☐ 1.B.1.a.i.1 Mining
 - ☐ 1.B.1.a.i.2 Post-mining seam gas emissions
 - ☐ 1.B.1.a.i.3 Abandoned underground mines
 - ☐ 1.B.1.a.i.4 Flaring of drained methane or conversion of methane to CO2
 - ☐ 1.B.1.a.ii Surface mines
 - ☐ 1.B.1.a.ii.1 Mining
 - ☐ 1.B.1.a.ii.2 Post-mining seam gas emissions
 - ☐ 1.B.1.b Uncontrolled combustion and burning coal dumps
 - ☐ 1.B.2 Oil and Natural Gas
 - ☐ 1.B.2.a Oil
 - ☐ 1.B.2.a.i Venting
 - ☐ 1.B.2.a.ii Flaring
 - ☐ 1.B.2.a.iii All Other
 - ☐ 1.B.2.a.iii.1 Exploration
 - ☐ 1.B.2.a.iii.2 Production and Upgrading
 - ☐ 1.B.2.a.iii.3 Transport
 - ☐ 1.B.2.a.iii.4 Refining
 - ☐ 1.B.2.a.iii.5 Distribution of oil products
 - ☐ 1.B.2.a.iii.6 Other
 - ☐ 1.B.2.b Natural Gas
 - ☐ 1.B.2.b.i Venting
 - ☐ 1.B.2.b.ii Flaring
 - ☐ 1.B.2.b.iii All Other
 - ☐ 1.B.2.b.iii.1 Exploration
 - ☐ 1.B.2.b.iii.2 Production
 - ☐ 1.B.2.b.iii.3 Processing
 - ☐ 1.B.2.b.iii.4 Transmission and Storage
 - ☐ 1.B.2.b.iii.5 Distribution
 - ☐ 1.B.2.b.iii.6 Other
 - ☐ 1.B.3 Other emissions from Energy Production
- ☐ 1.C Carbon dioxide Transport and Storage
 - ☐ 1.C.1 Transport of CO2
 - ☐ 1.C.1.a Pipelines
 - ☐ 1.C.1.b Ships
 - ☐ 1.C.1.c Other (please specify)
 - ☐ 1.C.2 Injection and Storage
 - ☐ 1.C.2.a Injection
 - ☐ 1.C.2.b Storage
 - ☐ 1.C.3 Other

Appendix H: Fuels

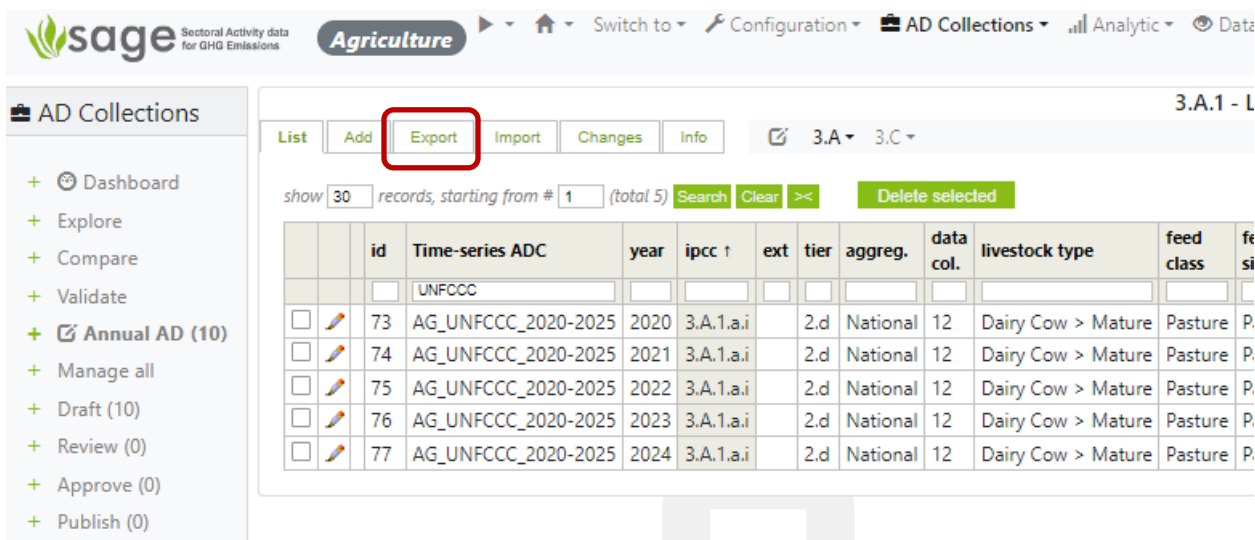
Anthracite	LNG (liquified natural gas)
Aviation Gasoline	LNG/CNG/API gravity 77 - 92
B20	Lubricants
B5	Medium crude oil/API gravity between 22 and 31
Biodiesels	methanol
Biogasoline	Middle distillate/gasoil (for transportation)
Biogasoline (=biopetrol)	Motor gasoline/(petrol) - oil product
Bitumen	Motor Gasoline
Bitumen/API gravity <10	Municipal Wastes (biomass fraction)
Blast Furnace Gas	Municipal Wastes (non-biomass fraction)
Brown Coal Briquettes	Naphtha
Charcoal	Natural Gas
CNG (compressed natural gas)	Natural Gas Liquids (NGLs)
Coal Bed Methane	Oil Shale and Tar Sands
Coal Tar	Orimulsion
Coke Oven Coke	Other Biogas
Coke Oven Coke and Lignite Coke	Other Bituminous Coal
Coke Oven Gas	Other Kerosene
Coking Coal	Other Liquid Biofuels
Condensate/API gravity from 50 to 80	Other Petroleum Products
Crude Oil	Other Primary Solid Biomass
Deep-cut extraction	Oxygen Steel Furnace Gas
Dry gas	Patent Fuel
E10	Peat
E3	Petroleum Coke
E5	Racing fuels
E85	Refinery Feedstocks
Enhanced gas recovery	Refinery Gas
ETBE11	Residual Fuel Oil
ETBE22	Shale Oil
Ethane	Sludge Gas
ethanol	Sour Crude Oil/API gravity approx. 30
Gas Coke	Sour gas plants
Gas Works Gas	Sub-Bituminous Coal
Gas/Diesel Oil	Sulphite Lyes (Black Liquor)
Gasoline	Sweet Crude Oil/API gravity approx. 30
Heavy crude oil/API gravity between 10 and 22	Sweet gas plants
Heavy Diesel	Sweet light crude oil/API gravity >35
Industrial Wastes	Synthetic crude oil/API gravity approx. 30
Jet fuel	Thermal oil/API gravity 31.5
Jet Gasoline	Total Crude Oil/API gravity approx. 30
Jet Kerosene	Total natural gas
Landfill Gas	Very Light Oil/API gravity >35
Light crude oil/API gravity between 31 and 35	Waste Oils
Light Diesel	Waxes
Lignite	White Spirit & SBP
Liquefied Petroleum Gases	Wood/Wood Waste

Appendix I: Fuel Categories

All
Biofuels
Biomass
Gas
Gas biomass
Gaseous Fossil
Gaseous fossil.type and origin
Liquid
Liquid biomass
Liquid Fossil.Primary Fuels
Liquid Fossil.Secondary Fuels
Liquid fossil.type and origin
Natural gas
Other
Other biomass
Other fossil fuels
Other gas
Other liquid
Other non-fossil fuels
Other solid
Peat
Solid
Solid biomass
Solid Fossil.Primary Fuels
Solid Fossil.Secondary Fuels

Appendix J: Export from SAGE

1. Using the EXPORT options SAGE:
 - a. Exporting an individual record(s) (It's the same procedure for AD Collections, records within collections, and the records from the Configuration layer)
 - Go to “List” page
 - Filter a record (or a group of records) using the list page facilities
 - Click EXPORT button above the list table
(all records from the Ag_UNFCCC_2020-2025 collection are now filtered out)



AD Collections

Dashboard, Explore, Compare, Validate, **Annual AD (10)**, Manage all, Draft (10), Review (0), Approve (0), Publish (0)

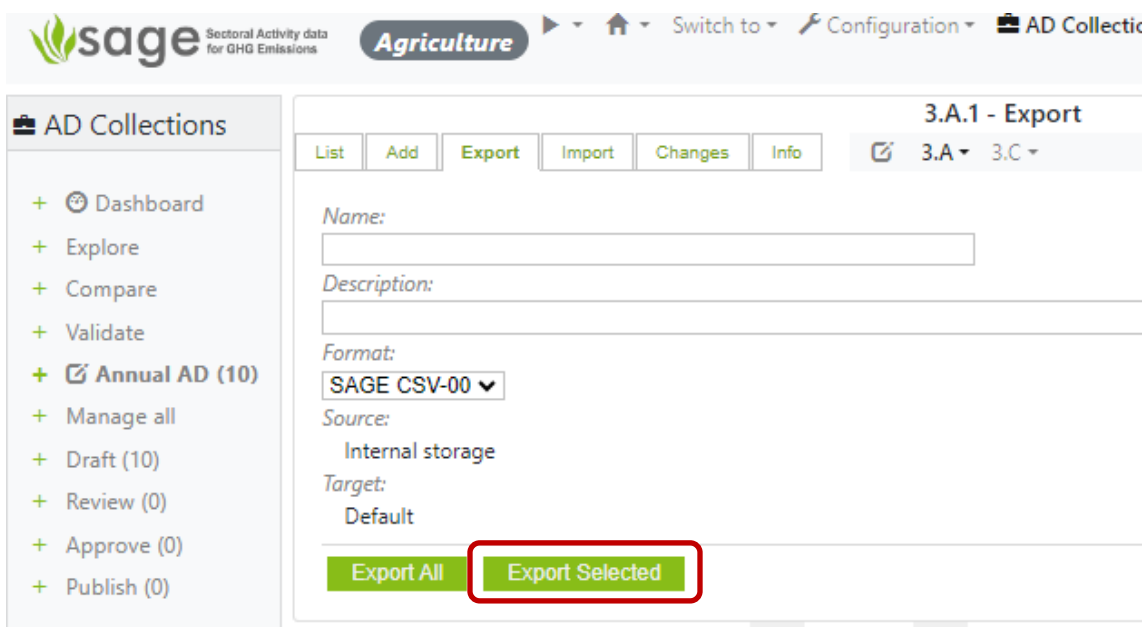
3.A.1 - L

List Add **Export** Import Changes Info 3.A 3.C

show 30 records, starting from # 1 (total 5) Search Clear >> Delete selected

	id	Time-series ADC	year	ipcc ↑	ext	tier	aggreg.	data col.	livestock type	feed class	fe	si
		UNFCCC										
<input type="checkbox"/>	73	AG_UNFCCC_2020-2025	2020	3.A.1.a.i		2.d	National	12	Dairy Cow > Mature	Pasture	P.	
<input type="checkbox"/>	74	AG_UNFCCC_2020-2025	2021	3.A.1.a.i		2.d	National	12	Dairy Cow > Mature	Pasture	P.	
<input type="checkbox"/>	75	AG_UNFCCC_2020-2025	2022	3.A.1.a.i		2.d	National	12	Dairy Cow > Mature	Pasture	P.	
<input type="checkbox"/>	76	AG_UNFCCC_2020-2025	2023	3.A.1.a.i		2.d	National	12	Dairy Cow > Mature	Pasture	P.	
<input type="checkbox"/>	77	AG_UNFCCC_2020-2025	2024	3.A.1.a.i		2.d	National	12	Dairy Cow > Mature	Pasture	P.	

Click “Export Selected”



AD Collections

Dashboard, Explore, Compare, Validate, **Annual AD (10)**, Manage all, Draft (10), Review (0), Approve (0), Publish (0)

3.A.1 - Export

List Add **Export** Import Changes Info 3.A 3.C

Name:

Description:

Format: SAGE CSV-00 ▼

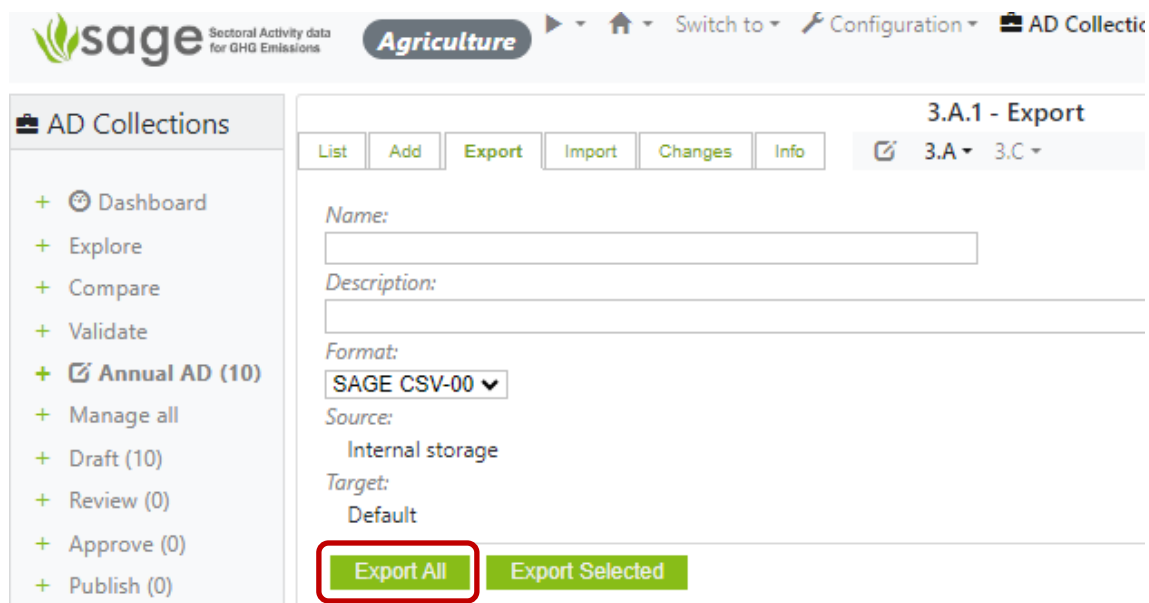
Source: Internal storage

Target: Default

Export All **Export Selected**

- b. Exporting the entire set of records

Export → Export ALL



The screenshot shows the Sage AD Collections interface. On the left is a sidebar with navigation links: Dashboard, Explore, Compare, Validate, Annual AD (10), Manage all, Draft (10), Review (0), Approve (0), and Publish (0). The main area is titled '3.A.1 - Export' and contains a form with fields for Name, Description, Format (set to SAGE CSV-00), Source (Internal storage), and Target (Default). At the bottom of the form are two buttons: 'Export All' (highlighted with a red box) and 'Export Selected'.

2. Alternatively:

- select a block of data or a table on the screen,
- Use Copy + Paste from nearly every screen – this works not only for the data sets but also the entire tables from the screen