

Energy Performance and Carbon Emissions Assessment Monitoring (ECAM) Quick Start Guide For Minnesota Environmental Assessment Worksheet (EAW) Preparers

This document is designed to assist Project Proposers, Project Proposer Consultants (users) of wastewater treatment plants looking for a detailed assessment of Greenhouse Gas (GHG) emissions to answer Item 18 of the EAW using the [ECAM tool](#). The web-based tool is designed for the complete urban water cycle, but this guidance document will only focus on the treatment stage (wastewater treatment). Users who are interested in additional information about the ECAM tool can visit the Methodology Guide and User Manual page by navigating to the ‘More’ tab.

This tool can be used to complete:

- GHG emissions assessment;
- energy performance assessment; and
- sludge management.

Step 1: Configuration

Click on the ‘Start your assessment’ button to navigate to the ‘Configuration’ page, where users select the Global Warming Report, the county, evaluation period, file name, and other inputs.

Use the following selections below for the configurations if actual data is not available. All other variables may stay at ECAM’s default values, which are based on the Intergovernmental Panel on Climate Change (IPCC) Guidelines (2006-2019) or be replaced with site-specific data if available.

Field	Selection
Global warming potential report	IPCC 5th AR (2014/2013)
Country	United States of America
Emissions factor for grid electricity	0.418 kg CO2/kWh (based on EPA’s Emission Factor Hub)

Field	Selection
Annual protein consumption per capita	44 g/person/year
BOD5 generation	90 g/person/day
Non-consumed protein added to the wastewater	1.75 kgN/kgN
Additional nitrogen from household products added to the wastewater	1.17 kgN/kgN

Click on the 'Access inventory' button to move on to Step 2.

Step 2: Inventory

Select '+ Create substage' button under the 'Treatment' column.

The screenshot shows the 'Sanitation' tool interface. At the top, there is a 'Save file' button. Below it, a navigation bar includes 'Sanitation' and four substage categories: 'Collection (0)', 'Treatment (0)', and 'Onsite sanitation (0)'. Each category has a '-no substages' label and a '+ create substage' button. The 'Treatment (0)' button is highlighted with a red box. Below the buttons, there are summary statistics for each stage: 'Distribution: 0 kgCO₂eq', 'Total Collection: 0 kgCO₂eq', 'Total Treatment: 0 kgCO₂eq', and 'Total Onsite sanitation: 0 kgCO₂eq'.

Proceed to enter the input values starting with the serviced population. After entering the population, the tool suggests estimation values for given inputs. If users do not have actual data, it is acceptable to use the estimations. The calculate estimates are based on equations from the IPCC. Users should note that the standard unit of measurement of flow for wastewater treatment plants in the U.S. of millions of gallons per day (mgd) is not an available option for volume of treated wastewater requires users to convert from mgd to m³/year.

Users should proceed through the 'INPUTS' section, either opting for the suggested estimation value suggested by the tool (when available) or real-world data. The estimates are calculated based on the general factors selected in the 'Configuration' tab.

The ECAM Tool provides a very detailed explanation of each value, which can be accessed by clicking on the light blue 'code'. Clicking on the code will take users to a section called 'Detailed info'. The information on this page will vary and can include definitions, constants, formulas, and sources behind an estimate or calculation.

The screenshot shows the 'INPUTS' and 'OUTPUTS' sections. The 'INPUTS' section is titled 'Enter the values for this stage' and includes a 'Highlight mode' checkbox. A red box highlights the 'Serviced population' input field with the code 'wwt_serv_pop' and the value '50,000 people'. A red arrow points from this code to the 'OUTPUTS' section, which is titled 'hide outputs' and shows 'GHG emissions' with units 'kgCO₂eq', 'kgCO₂eq/year', and 'kgCO₂eq/year/serv pop.'. A red box highlights the 'Abstraction' output field with the code 'ws_KPI_GHG_abs'.

Step 3: Inventory – additional information

While remaining on the 'Inventory – Inputs' section, users can provide additional data to create a more precise calculation of the whole treatment process, including:

- Do you have engines?

- Are you producing biogas from anaerobic digestion?
- Do you need to evaluate sludge management?

Within each additional section, further questions will appear, allowing users to input specifics. Within the option of sludge management, users have the option of modeling the storage of sludge at the wastewater treatment plant, composting, incineration, land application, landfilling, stockpiling, and transportation to the disposal site.

Step 4: Reviewing outputs

The 'Outputs' are displayed on the right with three options for displaying the results. Users should select kgCO₂eq/year to display the results. If the outputs are not displayed, click on 'Show outputs'.

show outputs

The outputs that Project Proposers/users should focus on are electricity (indirect), treatment process, and sludge management.

OUTPUTS —

GHG emissions

	Value	Σ sum (1 substages)	Unit
Electricity (indirect) <small>wwt_KPI_GHG_elec</small>	441,066	441,066	kgCO ₂ eq/year
Treatment process <small>wwt_KPI_GHG_tre</small>	873,496	873,496	kgCO ₂ eq/year
Sludge management <small>wwt_KPI_GHG_slu</small>	0	0	kgCO ₂ eq/year

The outputs must be converted from kg/year to tons/year for reporting in the EAW. Electricity (indirect) should be reported in the Off-site Electricity row in Item 18 of the EAW. The treatment process should be reported under non-combustion stationary equipment and sludge treatment should be reported as off-site waste management in the EAW.

Step 5: Saving and loading data

The ECAM tool does not allow users to save information within the tool. However, users can save the data as a .json file and load it back into the tool later. The files are saved with the extension JSON. After entering data, users can select the Save File button located in the upper right corner of the 'Inventory' section.

The screenshot shows the ECAM tool interface. At the top, it says "ECAM Energy Performance and Carbon Emissions Assessment and Monitoring Tool" with version "v3.0.1" and language "EN". The navigation bar includes "Home", "Configuration", "Inventory", "Results", "Compare assessments", and "More". The user is editing "Zimmerman WWTP" with a total of 1,404,557 kgCO₂eq, 365 days, and 0.42 kgCO₂/Wh. A "Save file" button is visible in the top right of the inventory section.

The inventory section is divided into "Water supply" (blue) and "Sanitation" (red). Under "Water supply", there are icons for Abstraction (0), Treatment (0), and Distribution (0). Under "Sanitation", there are icons for Collection (0), Treatment (1), and Onsite sanitation (0).

The "Configuration" section is expanded to show "Load and save file". It contains a "Load file" section with a "Choose File" button (highlighted with a red box) and a "No file chosen" message. Below it is a "Replace current list" button.

To load previously saved files, navigate to the 'Configuration' tab and toggle down the 'Load and save file' option. Select the 'Choose file' button.