On behalf of:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

IWA the international water association

Join Pioneering Utilities in Reducing Energy Use and Carbon Emissions!

The Energy performance and Carbon emissions Assessment and Monitoring Tool, ECAM for Water and Wastewater Utilities

Context

The Water and Wastewater Companies for Climate Mitigation Project, **WaCCliM**, supports utilities in Middle Income Counties in identifying processes and technologies to reduce their carbon footprint. This requires a quantification of greenhouse gas (GHG) emissions in order to determine the "baseline" for each utility, understand where to improve and monitor reductions throughout the project. Direct and indirect emissions from fuel and electricity consumption, as well as from methane and nitrous oxides in wastewater systems are quantified.

The WaCCliM pilot utilities in Mexico, Peru and Thailand are pioneering Greenhouse Gas Emissions (GHG) accounting on the water sector. Using ECAM prepares them for future reporting on climate change mitigation.

WHY ECAM?

The tool was developed to allow utilities to (1) assess the origin of their GHG emissions and their relative weight and (2) identify potential areas for improvement, in particular in regards to energy savings. The same tool is used to forecast the reduction impact of future measures and monitor the results after their implementation.

3 STEPS Assessment

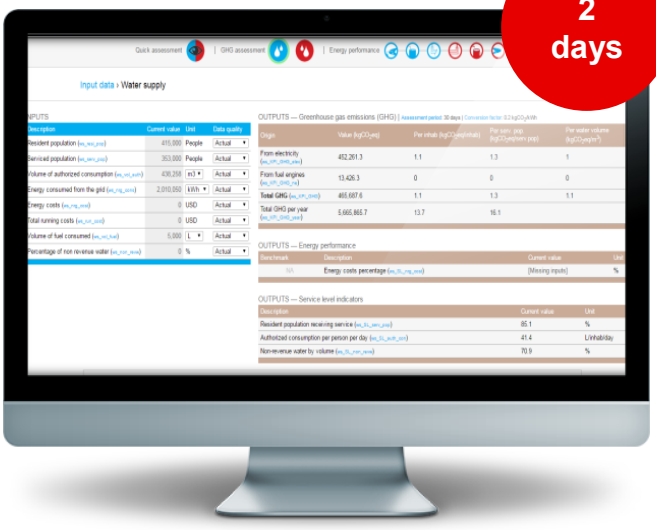
Data is collected to document the utility: type of systems, their performance, the level of service and the natural constraints. From the quick assessment to the detailed assessment, the user is guided through three steps, each requiring a more advanced level of engagement.

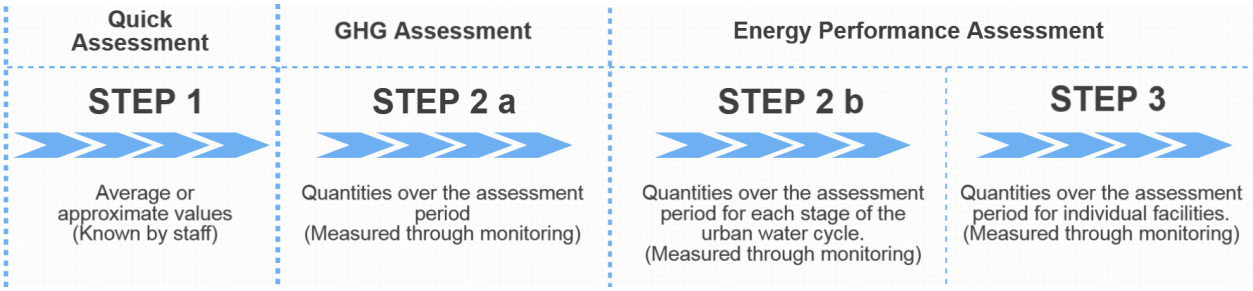
Quick Assessment

15 MIN

Detailed Assessment

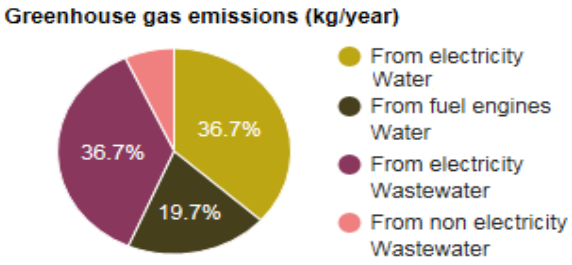
2 days





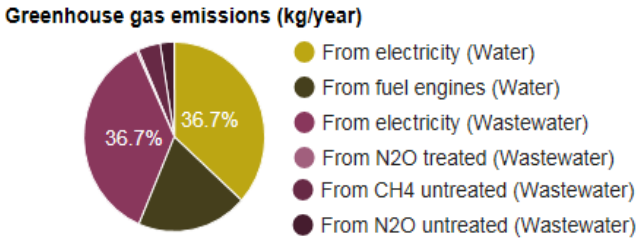
STEP 1 Quick Assessment

The objective is to provide a rough assessment of the utility's energy use and GHG emissions in only a few minutes and using only average data typically known by the utility managers. The visual overview of the weight of electricity both on operational costs and on the overall emissions is a teaser to go to STEP 2 to investigate energy performance.



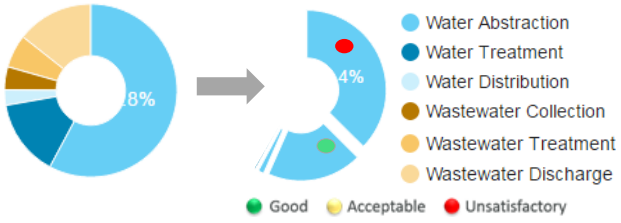
STEP 2a GHG Detailed Assessment

The objective is to provide a thorough assessment of the utility's GHG emissions using monitoring data over a defined assessment period. It is more precise than the quick assessment and can be used as a baseline to monitor progress. The visual overview of the weight of emissions from 5 different origins allows the utility to prioritize actions.



STEP 2b and 3 Energy Detailed Assessment

The objective is to provide a thorough assessment of the utility's energy use by stage (step 2b) and performance by facility (step 3). Stages using the most energy can be investigated by evaluating the performance of their individual facilities by comparing to benchmark values. The visual overview of the weight of each stage, and of performance of facilities within the investigated stages, allows the utility to prioritize actions.



What ECAM offers…

- A tool for carbon reporting by water and wastewater utilities, potentially useful for funding project and preparing the utility for future mandatory reporting
- Self-assessment by utilities of their performance and a means to monitor progress.
- A baseline which shows utilities where they stand in terms of GHG emissions, energy consumption and service level, with a focus on the emissions that can be influenced by the utility staff.
- The identification of potential areas for improvement to be investigated, thanks to internationally recognized benchmarking
- A tool to run scenarios to forecast the impact of future measures on total GHG emissions of the utility
- The same methodology can be applied to utilities nationwide, facilitating national benchmarking and knowledge exchange between utilities.
- Data required is fairly basic and typically available in utilities
- N2O emissions in the wastewater treatment are shown as calculated per the IPCC method to raise awareness on their importance, but not included in total emissions.

**ECAM Tool is optimized for Google Chrome and not tested in other browsers yet.*

Performance Indicators, Service Levels and Benchmarking

In order to obtain performance indicators which can be monitored over time or compared between utilities, GHG emissions (kg CO2e) and energy consumption (kWh) quantities are divided by: the resident population, the serviced population, the authorized consumption or the mass of organic pollution removed in the wastewater.

The performance indicators are always associated to the service level indicators for comparison between utilities and monitoring of reductions, while ensuring the service is maintained or improved.

At individual facility level, the performance indicators such as standardised energy for pumping, or energy valorisation in wastewater, are benchmarked, allowing the utility to identify the areas where performance can be improved.

Holistic Water Cycle Approach

Potential improvements are identified within the different stages of the urban water cycle, keeping in mind that stages are interlinked and that a holistic approach is necessary prior to defining specific measures.