

# Carbon footprint assessment of urban water utilities

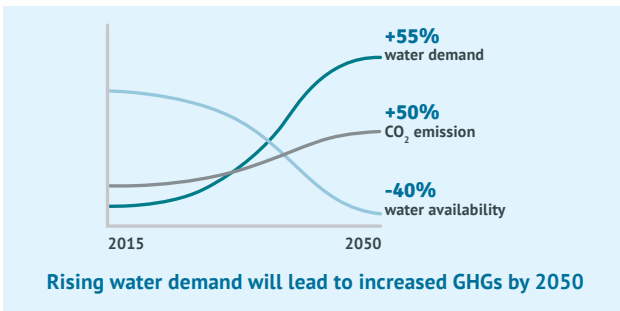
## Energy Performance and Carbon Emissions Assessment and Monitoring Tool



### Background

The Water and Wastewater Companies for Climate Mitigation (WaCCliM) project is guiding water and wastewater utilities on a journey to energy and carbon neutrality. Four pilot utilities - in Mexico, Thailand, Peru and Jordan - are tackling this global climate mitigation challenge.

Limiting climate change to 1.5°C requires substantial reductions in greenhouse gas (GHG) emissions in all sectors. The urban water sector has under-recognized opportunities to reduce carbon emissions that will contribute to the successful implementation of the Paris Agreement through increasing the Nationally Determined Contributions (NDCs) of supporting countries.



The Energy Performance and Carbon Emissions Assessment and Monitoring (ECAM) Tool, offers a solution for utilities to quantify their GHG emissions and contribution to NDCs through reducing indirect and direct emissions from energy use and wastewater management.

### Objective

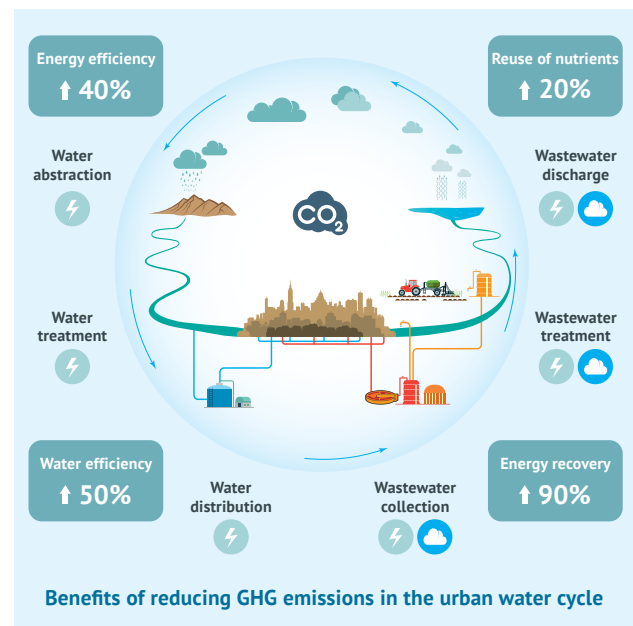
The ECAM tool is the first of its kind to allow for a holistic approach of the urban water cycle to drive GHG emission reduction in utilities, even those with limited data availability. It promotes transparency, accuracy, completeness, comparability and consistency. It is designed to assess the carbon emissions that utilities can control within the urban water cycle, and prepares utilities for future reporting needs on climate mitigation. By combining carbon and energy assessments, ECAM takes into account that reducing operational costs is a main driver for utilities. It can be used for:

- GHG emissions assessment
- Energy performance assessment
- Identifying opportunities for reducing CO<sub>2</sub>e emissions
- Reducing energy consumption

ECAM also provides the opportunity to develop scenarios and model reduction impacts of future measures, as well as monitor the results after their implementation.

### Approach

ECAM follows a tiered approach, with an increasing level of detail from Tier A to Tier B. The Initial GHG Assessment (Tier A) provides an overview of major GHG sources and quantities using basic assumptions. The Detailed GHG Assessment (Tier B) provides a more advanced level of GHG assessment using detailed data to gain a more accurate and refined picture of the utility's GHG emissions and energy performance, as data is entered for each stage of the urban water cycle. Proceeding from Tier A to Tier B, there is also an increasing degree of certainty in GHG emissions.



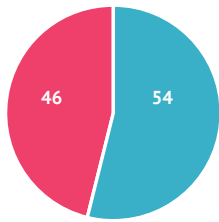
Input data includes: type of systems, performance parameters, serviced population and natural constraints. For each stage of the urban water cycle, data is used to derive key and complementary Performance Indicators (PIs) for the GHG and energy assessment. Additionally, the energy situation of the utility is assessed to evaluate if energy savings are an economic driver to reduce GHG emissions.

Finally, opportunities for improvements are identified while possible solutions can be evaluated with ECAM, keeping in mind that the different stages of the urban water cycle are interlinked and that a holistic approach is necessary prior to defining specific measures.



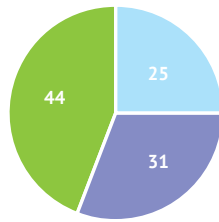
### Tier A: Initial GHG Assessment

GHG emissions by water system  
total 9000 t CO<sub>2</sub>eq (%)



■ Water Supply (WS)  
■ Wastewater Treatment (WW)

GHG emissions by source  
total 9000 t CO<sub>2</sub>eq (%)

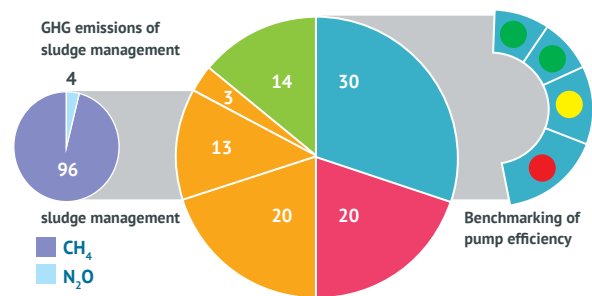


■ Electricity  
■ CH<sub>4</sub>  
■ N<sub>2</sub>O



### Tier B: Detailed GHG Assessment

GHG emissions by stage and by substage  
total 9000 t CO<sub>2</sub>eq (%)



■ WS abstraction  
■ WW collection  
■ WW treatment  
■ WW discharge

## What ECAM offers for water and wastewater utilities:

- A tool for GHG reduction
- A tool to assess carbon footprint, energy consumption and service levels
- A tool to reduce operational costs
- A tool to strengthen performance monitoring and decision making
- A tool to develop scenarios on the future impact of GHG reduction measures

## What ECAM offers for the water sector:

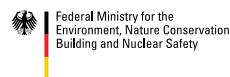
- A tool for monitoring, reporting and verifying the water sector's GHG reduction contribution to the NDCs
- Requires only data typically available in utilities in developing and emerging economies
- Facilitates national benchmarking and knowledge exchange between utilities

## Impact

ECAM was developed to be consistent with the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories and peer-reviewed literature. It offers a transparent and sound approach for emission calculation within the water sector. ECAM helps link Monitoring, Reporting and Verification (MRV) of mitigation actions in the water sector to the national level.



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