

Master Thesis

# Life Cycle Assessment (LCA) of Serological Glass Pipettes in Wet Labs to Increase Sustainability in Life Science Research

## Background

Life science research is essential for advancing our understanding of the living organisms and their processes, ultimately improving health, advancing technology and addressing environmental challenges. Yet, involved research activities consume significant resources and generate substantial waste. "Wet labs" are laboratories that are specifically designed for conducting experiments that involve handling of liquids, biological materials, chemical etc. Typically wet labs use much more energy and water than office spaces and the generated plastic waste is connected to a plethora of environmental impacts. One central consumable used daily are serological pipettes which transfer and measure exact volumes of different types of biological and chemical solutions. They are available in two configurations, as single-use plastic or reusable glass pipettes. Reusable serological glass pipettes are known for their chemical resistance but require energy-intensive cleaning processes such as autoclaving. In contrast, single-use serological plastic pipettes are valued for their convenience and reduced contamination risk.

## Methods

- Compare the environmental impacts of both pipette types in a Life Cycle Assessment (LCA)
- Key metrics include climate change impacts, water use, energy consumption and waste generation, among others
- Perform an economic analysis to evaluate daily costs for the users

## Requirements

- Ideally first experience with or background knowledge on the LCA method
- Quick wit
- Willingness to travel to both sites, Munich and Straubing, and to observe the pipette use in the wet labs
- Strong communication skills to collect data for the life cycle inventory (LCI)
- Structured way of working

## Application

We are looking forward to your application via the [Chair for Circular Economy thesis form](#).

*Valid from 2<sup>nd</sup> September 2024*