

## Student Assistant

### Subject: Integrated water-waste and energy management systems for community housing in Latin American countries, as soon as possible, duration 6 months

Karlsruhe, 29.03.2021

#### Topic:

Urbanization is one of the core challenges for many cities in Latin America, fueled mainly by rural immigrants. It is coupled with an increasing demand for limited resources such as water, energy, and food. In addition, a sustainable treatment of solid waste and wastewater is also required, aiming to minimize impacts on health and environment. Current systems fail to satisfy these demands.

To overcome the obstacles of the current water, energy and waste systems, an integrated management of the different resources seems to be a promising solution for the sustainable metabolism of the city. Such a system could help to implement a circular economy on a community level. However, the shape of such a system is influenced by a set of different factors, like climate conditions, socio-economic conditions or legal frame.

The aim of the research contribution is three-fold: 1) to analyze the current system water, energy and waste system regarding material and energy flows, involved stakeholders within a neighborhood; 2) to develop an integrated water-energy-waste system for that neighborhood, taking into account the climate conditions, socio-economic and legal conditions; 3) to analyze the proposition regarding selected indicators. The area to be researched is situated in a rural-semi urban region in Mexico.

#### Description of the task:

- Identification of existing urban infrastructure to define crucial local problems (e.g., water scarcity, energy backup, improvement of waste management systems) that new settlements can face in the chosen city.
- Design of a detailed material flow management models for decision-making in order to prioritize selected technologies for a minimal sizing and maximal sizing of an efficient integrated water-waste and energy management.

#### Personal qualifications:

- Students of last semesters of Master in geo-environmental sciences, urban/spatial planning, renewable energy, energy technologies, environmental engineering, or similar subjects.
- Good command of English, as the official language of the thesis/research project.
- Native Spanish language with Latin American background (the area to search requires cultural skills to gather scattered information).
- Position in Karlsruhe, Germany. **Students must be living already and hold a current residence in Germany.** Applicants not meeting this legal requirement will not be considered.
- Basic technical and economic understanding of the related system mentioned, as well as for material flow analysis.
- Good knowledge of MS Office.
- Independent and result-oriented way of working.
- Interdisciplinary approach to handle multi-perspective issues.
- Critical reflection on issues encountered.

#### Contact:

Please send your application with a motivation letter and complete attachments (CV, English official test proof, Master enrollment certificate with marks, Bachelor certificate with marks) to M.Eng. Patricia Oviedo at [patricia.oviedo@kit.edu](mailto:patricia.oviedo@kit.edu) Incomplete applications will not be considered. The student will be hired as a Student Assistant (HiWi).