Energy sourcing in the urban landscape

There is increasing awareness by water service operators of the imperative to lower their carbon footprint by improving efficiency in both energy and water consumption. The processes involved in the urban water cycle, i.e. drinking and waste water treatment, distribution and collection, are energy intensive. There is urgent need to propose and implement solutions oriented to optimize the water-energy balance in urban water systems. The issues addressed by this module will focus on how to analyze, conceptualize and design solutions for harvesting energy in the urban landscape? Thus, the module will provide the students with the skills to audit the water and energy nexus of a water supply systems, identify and evaluate potential points for energy harvesting in the urban water cycle and develop appropriate technical solutions for their implementation. Students will: describe and model urban water networks; study the potential of micro-hydropower in pipe networks; design micro-hydropower schemes for water distribution systems; acquire the fundamentals of wastewater conversion to energy and reactor design basics; design the optimal integrated energy harvesting schemes along the urban water cycle according to local context.