Facilitating the Planning of integrated Water-Energy-Food-Environment Systems through Open Software

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Addressing climate change, environmental degradation, and resource scarcity while ensuring the basic supply of the growing earth population are fundamental global challenges. In this context, the integration of water, energy, food, and environment systems for tapping cross-sectoral synergies and minimizing trade-offs presents a profound opportunity. However, despite their huge potential, integrated water-energy-food-environment systems (iWEFEs) are rarely put into practice because of, among others, a lack of site-specific data and open tools to describe, model, and plan such integrated infrastructure systems. The project addresses this gap through open software developed in a scientific process and applied to respective case studies.

The three main research and software development pillars of the project are the following:
1. Conceptualization of open water, energy, food, and environment modeling framework – OWEFE enabling the development of an open iWEFEs component database
2. Facilitation and automation of WEFE data collection and analysis - WEFE Site Analyst
3. Development of a software-based configurator for site-tailored iWEFEs – iWEFEs Configurator

The open software tools shall support small communities, end-users, and NGOs to improve local water, energy, and food security while protecting the climate and the environment.