DIWIEN

Digitalization of water supply infrastructure to optimize the Water-Energy Nexus

> *DIWIEN brings the domains of water and energy together by innovative digital solutions in rural and urban areas.*

The water-energy (WE) nexus describes the vital interaction between two essential components for a modern society. Energy needs water for hydropower, cooling and biofuels. Water needs energy for pumping, treatment and purification. This nexus can be optimized through innovative digital solutions, by securing water supply while improving renewable energy production leading to reduced greenhouse gas emission and embraced carbon neutrality by 2050.

DIWIEN aims to develop an integrated approach for WE nexus in rural and urban areas by creating a digital twin of the water supply system, identifying possible digitalized solutions as smart sensors or energy recovery units with techno-economic analyses in 4 pilot sites. DIWIEN will create new markets by combining energy and water supply sectors within the WE perspective with minimum environmental impact and maximum energy savings by facilitating the digital transition towards green energy production while ensuring the water supply.

Project Duration

01.03.2022 - 01.03.2025

Project Budget

Total Budget: € 893,998. -

Funding: € 893,998. -

Project Coordinator

TUBITAK Marmara Research Center (Turkey)

Project Partners

- Vienna University of Technology (Austria)
- Energy Institute at the Johannes Kepler University (Austria)
- Brno University of Technology (Czechia)
- Izmir Water and Sewerage Administration (Turkey)
- City Municipality Ferlach (Austria)

Project Website

TBA

Contact

dogan.gezer@tubitak.gov.tr.

ERA-Net Smart Energy Systems

ERA-Net Smart Energy Systems Joint Call 2020 (MICall20)

This project has been awarded funding within the ERA-Net SES Joint Call 2020 for transnational research, development and demonstration projects. 22 Mio EUR of funding have been granted to 21 projects active in 17 regions and countries.

This project has been funded by partners of the ERA-Net Smart Energy Systems (www.eranet-smartenergysystems.eu) and Mission Innovation (mission-innovation.net) through the Joint Call 2020. As such, this project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 883973.

Joint Programming for Flourishing Innovation – from Local and Regional Trials towards a Transnational Knowledge Community

www.eranet-smartenergysystems.eu

Main Objectives

1. Bringing together science and stakeholders to develop a digitalized hydropower solution for green transition.
2. Setting up a digital twin of the water supply network.
3. Identification of the possible energy generation locations in the freshwater system
4. Comparison of existing hydropower units in drinking water systems with systems that lack digitalization and energy production/consumption
5. Optimization of the operation of the hydropower unit and motor/pump stations
6. Replication of the digitalization aspects to other pilots
7. Techno-economic analysis

Main Results

1. Establish the digital twin of the water distribution network, as a simulation model.
2. Identify the locations for power generation including pressure losses.
3. Identify locations for remote sensors for real-time monitoring of the combined water supply and energy recovery systems.
4. Optimize pressure distribution of the water supply system
5. Conduct economic feasibility, market and replication potential analysis.
6. Evaluate the effects of power generation in water supply networks from the climate impacts points of view.

TÜBİTAK

MAM

TU WIEN TECHNISCHE UNIVERSITÄT WIEN Vienna University of Technology

ENERGIE INSTITUT an der Johannes Kepler Universität Linz

BRNO UNIVERSITY OF TECHNOLOGY

İZSU