

This demo focuses on developing a digital twin of the hydro system to model the optimal HPP operation featuring enhanced use of the hydro generation potential. Predictive maintenance, early faults detection and avoidance further increase the power generation efficiency of the HPP Wały Śląskie.

#### Major Impact Factors:

- Modeling and CFD
- Simulation Capabilities
- Monitoring and Analytics in real time
- Scalability
- Flexibility
- Visualisation
- Accessibility
- Interoperability
- Cybersecurity

DEMO LEADER



Poland



*"The D-HYDROFLEX project is a unique opportunity for the digitalization of the hydropower assets at TEE. Hydro system operation modeling and early fault detection increase operability"* – Przemysław Janik, TEE



## Technology Types:

- Data Collection and Integration
- 3D Modelling and CFD Simulation
- Hydrological Prediction - Machine Learning
- Performance Monitoring and Trending
- Results Visualisation

## Components:

- Hydro System at demo HPP
- Measurement and data acquisition system
- Hydro System Digital Twin HYDRO-TIN
- Hydrological Modeling and Prediction HYDRO-HMP
- Predictive Vibration and Insight Logger HYDRO-PVIL

## Fields of Application:

- Operational Efficiency
- Predictive Maintenance
- Water Resource Management and Utilization
- Energy Generation Optimization
- Research Environment

## Expected Benefits:

- Modeling of Hydro System components
- Analysis of various operational conditions and settings
- Increased power generation
- Predictive maintenance

## Technology Readiness Level (TRL):

- Hydro system digital twin - initial TRL 4
- Hydro system digital twin - target TRL 6