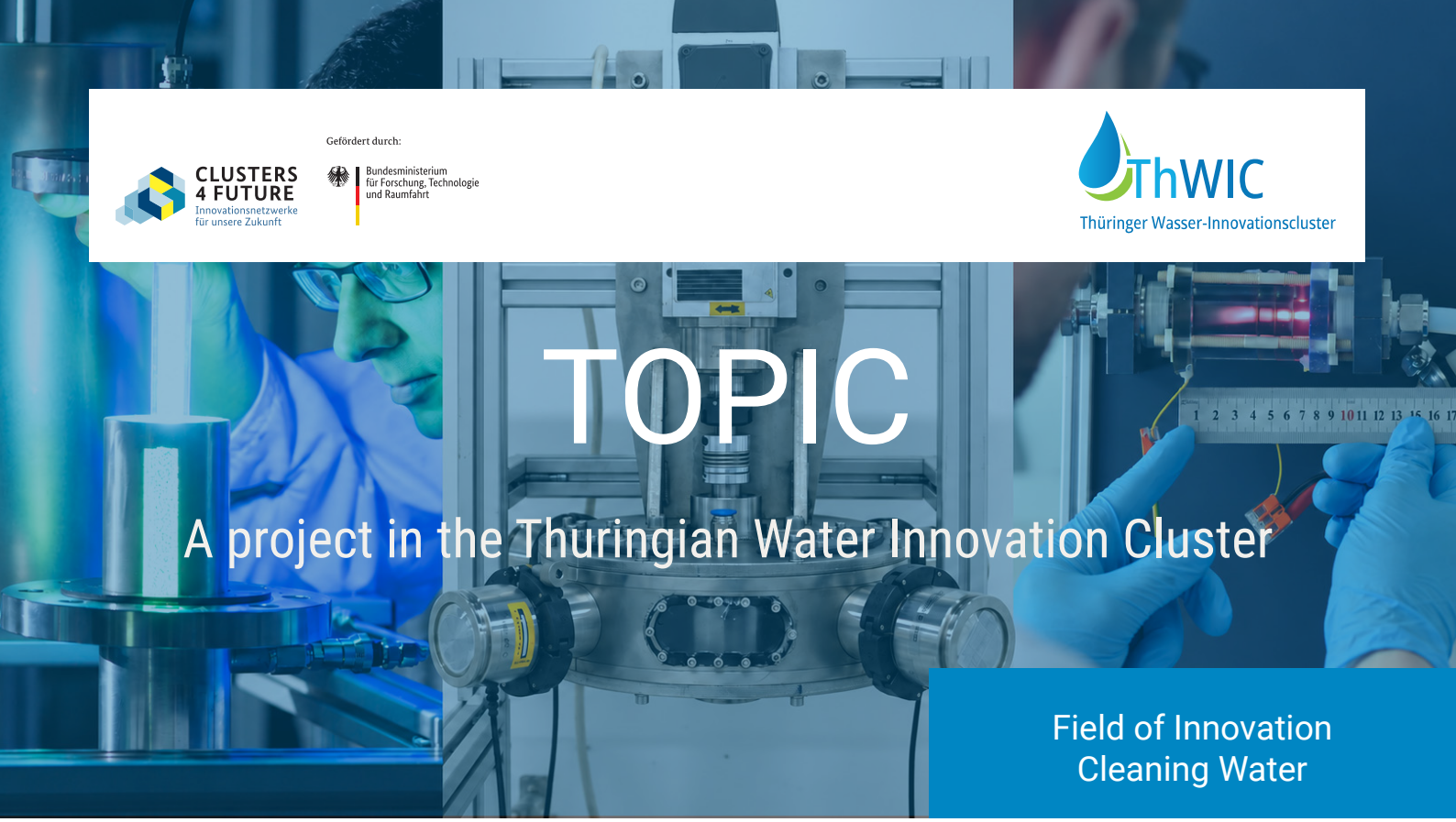


Gefördert durch:

CLUSTERS 4 FUTURE
Innovationsnetzwerke für unsere Zukunft

Bundesministerium für Forschung, Technologie und Raumfahrt

ThWIC
Thüringer Wasser-Innovationscluster

TOPIC

A project in the Thuringian Water Innovation Cluster

Field of Innovation
Cleaning Water

Pollutant degradation in wastewater

TOPIC – Technical Oxidation Processes for Industry and Chemistry

Background

Increasing human water use continuously introduces pharmaceutical and chemical residues (micropollutants, contaminants of emerging concern) and multi-drug-resistant microorganisms into aquatic environments.

Germany's National Water Strategy and the Urban Wastewater Treatment Directive (UWWTD) give greater weight to the precautionary and polluter-pays principles. Conventional processes (activated carbon, ozonation, reverse osmosis) offer incomplete solutions, producing problematic by-products and concentrates that are difficult to dispose of, while requiring substantial energy and chemicals.
Sustainable, energy- and material-efficient, modularly scalable technologies are therefore needed.

Project

The TOPIC collaborative project aims to develop sustainable, energy- and material-efficient treatment technologies for industrial wastewater and process water.

It focuses on three advanced oxidation processes (AOPs) for micropollutant removal, developed, tested and systematically compared under real industrial conditions: HyKavOz (a hybrid cavitation reactor coupled with ozone), AdCat (adsorptive pollutant capture and hybrid catalytic degradation on functionalised ceramic foams) and CavPlas (cavitation-assisted cold plasma). Most build on ThWIC Phase 1 results.

Following requirements definition and successful laboratory testing, the processes will be transferred to field conditions. The interdisciplinary consortium of six partners covers the entire value chain.

At the Bitterfeld-Wolfen joint wastewater treatment plant, the technologies will be advanced to TRL 5–6, integrated into modular test containers and demonstrated to users, contributing to ThWIC's „Water Treatment" innovation field and Germany's National Water Strategy.

Fields of Application

Three innovative oxidation technologies, HyKavOz, AdCat and CavPlas, degrade micropollutants, microorganisms and resistance genes with low emissions and high energy efficiency, directly where wastewater is generated.

Environmental Technology

ThWIC Fact Sheet
Cluster of the Clusters4Future Initiative (BMFTR)

Goals

1. Innovative approaches for safe water supply
2. Establishment of an integrated water assessment
3. Impact on the economy and society

Consortium

50 partners from Business, Science and Associations.

Structure

35 projects in
4 fields of innovation:
»Analysing Water«,
»Cleaning Water«,
»Assessing Water«
»Understanding and Explaining
Water" and
6 innovation-supporting frameworks.

Cluster Spokespersons

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Positioning of the project within ThWIC

Field of Innovation: Cleaning Water
Target Industry: Chemical industry, particularly chemical parks
Links with other ThWIC projects: TOPIC builds on UltraStaRK results from ThWIC's first implementation phase, combining innovative water treatment with sensor technologies from KARLsens and ReOnSenSys and the site-specific approaches of IWIP. Piloting the technologies at Bitterfeld-Wolfen Chemical Park supports their transfer into industrial applications. Further links exist with WaWasI and LitLab.

Fields of Application (continued)

Integrated into flexible container systems, they are modularly scalable and adaptable to applications ranging from industrial process water and quaternary treatment at municipal wastewater treatment plants to groundwater and bank filtrate treatment.

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