

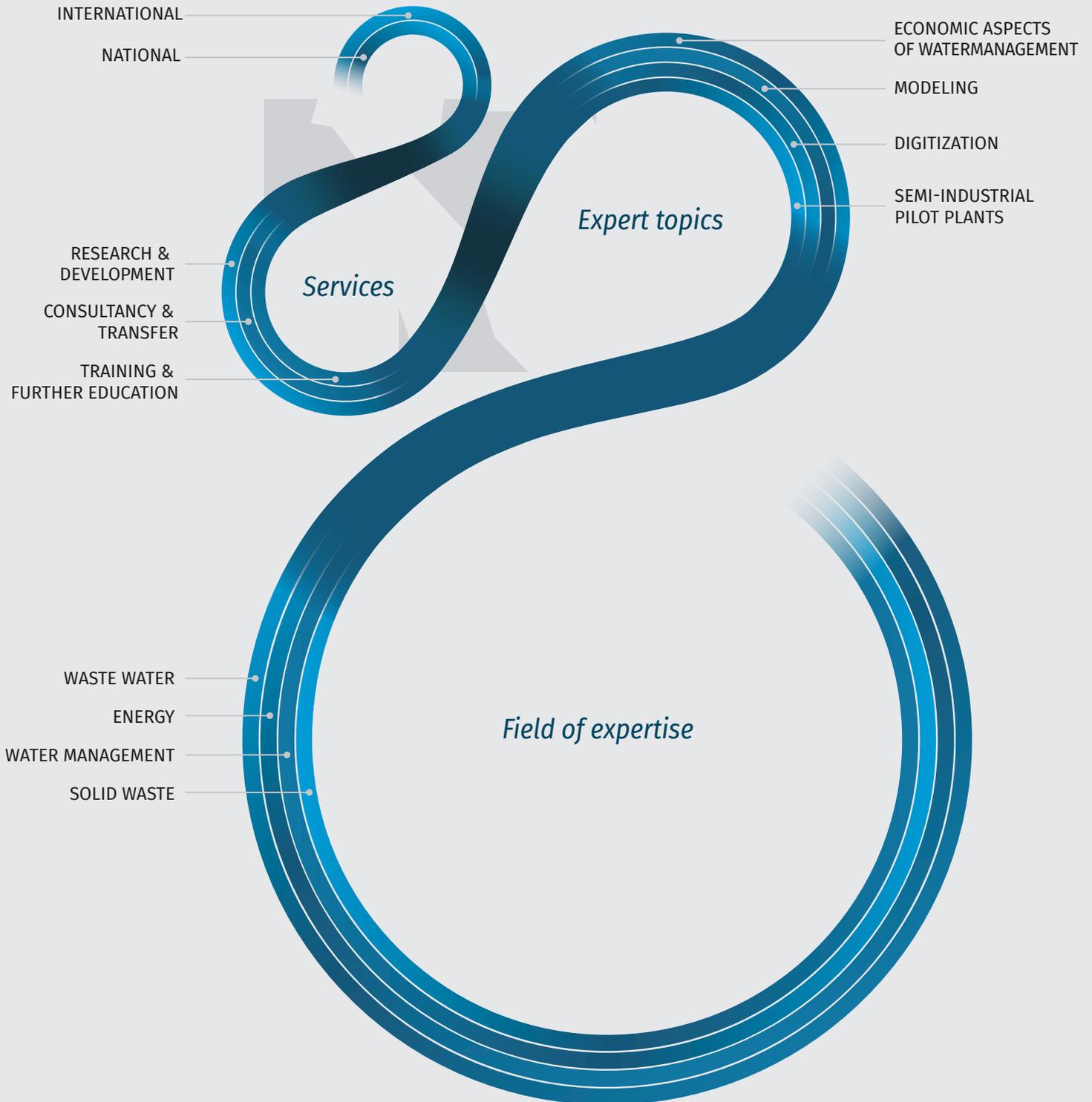


RESEARCH AND TRANSFER FOR WATER MANAGEMENT

SUSTAINABLE. INNOVATIVE. PRACTICAL.

since **1979**

FLOW OF EXPERTISE





Dr. sc. Dipl.-Ing. Frank-Andreas Weber
CEO



The Research Institute for Water and Waste Management at RWTH Aachen (FiW) e.V. was founded in 1979 as an independent institute at RWTH Aachen. Its close connection to the university provides the institute with the best foundation for the development of interdisciplinary solutions to problems in water and waste management.

FiW is one of the leading environmental research institutes in the field of water and waste management. We aim to provide sustainable strategies and develop innovative methods.

FiW CONNECTS

The non-profit organization FiW draws its strength from two fundamental sources: on the one hand, an excellent interdisciplinary and intercultural team of highly motivated scientific staff, and on the other hand, partners in science, politics and the industry who are actively engaged in FiW's projects and offer invaluable support as members of FiW's governing body (FiW e.V.) and the research advisory board.

With our expanding networks and increasing collaboration with other institutes at RWTH Aachen and FH Aachen as well as the Research Center Jülich, we are actively paving the way for an enhanced regional networking of the stakeholders in water research.

The German water industry bathes in rich tradition and the city of Aachen has always played a fundamental role. It is thus our vision to unite the various players in the science hub of Aachen and to strengthen the regional networking in water research, in order to further promote the focus on water.



RESEARCH & DEVELOPMENT

In a multitude of collaborative projects, we develop application-oriented solutions in cooperation with various research partners from the scientific field and the industry, while always ensuring economic viability. Scientific cooperation with foreign universities and the initiation of research projects at EU level complete our R&D department.

- **Developing sustainable and application-oriented concepts, processes and strategies**
- **Networking and network coordination**
- **Assisting municipalities, associations and other actors through knowledge building, support in political committees and development of concrete and actionable measures**
- **Developing and optimizing planning and management processes**



WE OPERATE WITH OBJECTIVITY, SCIENTIFIC INDEPENDENCE, AND A HIGH LEVEL OF PROFESSIONAL AUTHORITY



CONSULTANCY & TRANSFER

As an interdisciplinary institute, we are in a position to respond quickly to public tenders and direct inquiries and to guarantee reliable services.

Public and private operators of sewage treatment plants and sewer networks can rely on our outstanding expertise. As an independent non-profit institute affiliated with RWTH Aachen, FiW offers a gateway between research and practice attractive for small and medium-sized companies.

- **Expert opinions & realization of studies**
- **Consulting and general technical support for engineers, manufacturers and operators**
- **Analyses with laboratory and semi-technical pilot plants**
- **Scientific support for large-scale plants**
- **Organization of conferences and symposia**
- **Profitability assessments, financing schemes, contribution and fee models**



FiW DISTINGUISHES ITSELF AS A DRIVER OF INNOVATION



DIGITALIZATION & MODELING

The digitization of water management has created major development opportunities, which are driven by the vastly extended possibilities of decentralized data acquisition, the transmission and networking of large data volumes, the automation of analyses, visualizations and simulations and the computerized optimization of scenarios, and thus the use of data for decision-making and management processes virtually in real time. We recognize the tremendous potential for improving processes and decision-making in water supply and disposal, not least through increased cost-effectiveness and flexibility.

We develop projects in the fields of water management, urban drainage and waste water disposal, including the link to the energy sector. Key areas include sewer network operation, sewage treatment plant optimization and waste water treatment, energy management, water monitoring and management, sensor technology in urban areas, distributed and virtual sensing, modeling, and the resulting forecasting models.

In the course of the development towards a water management 4.0, one objective is the use of sensors and models (virtual sensors) with the aim of making real-time information about the entire system readily available. FiW already implements GIS tools and models in a variety of projects. By collecting and visualizing geodata and combining it with models the information density of systems is enhanced, making planning processes and optimizations more effective – we have thus laid the foundation for handling big data.

Tools for modeling and GIS analysis at FiW:

- **GIS systems (ESRI ArcGIS, QGIS)**
- **Sewage plant and process simulation (SIMBA, Matlab Simulink)**
- **Sewer network simulation (SWMM, MIKE URBAN)**
- **Hydrological and surface simulation (MIKE 11, MIKE 21, MIKE FLOOD, HecRAS)**
- **Water quality simulation**
- **DWA Water quality model, HecRAS**



WATER MANAGEMENT 4.0 MEANS INTERLINKING, ADDED VALUE AND SOLID BASES FOR DECISION-MAKING





ANAEROBIC TECHNOLOGY AT THE TESTING CENTER IN STOLBERG

An anaerobic pilot plant with five fermenters of different sizes was set up at the waste water treatment plant in Stolberg on FiW's experimental site. The plant facilitates both the **hands-on training** of the operating personnel of sewage treatment plants and the realization of anaerobic degradation tests for **R&D purposes**.

A total of five pilot fermenters are available for the anaerobic degradation tests:

- **2 x 50 L fermenters for pilot testing**
- **1 x 500 L, 1 x 1,000 L and 1 x 2,000 L fermenters with fully automated PLC control for process engineering investigations**

The plant is, for the most part, fed with raw sludge from the Stolberg sewage treatment plant. Test results can thus be compared with the operating data of large-scale technology.

The fermenters have several sampling points. The pH value, redox potential and temperature are measured and recorded online.

The gas production of each fermenter is continuously monitored by means of a gas meter, barometer and hygrometer. The gas composition can be analyzed for the standard biogas components CH_4 , CO_2 , H_2S and O_2 . Further components can be measured with the help of nearby external laboratories. The plant is equipped with a PLC control system as well as a process control system. Operating data is recorded automatically.

In addition to industrial consulting and the realization of test runs for R&D purposes, practical training of operating personnel is also possible in the Stolberg test park. Distressing situations which could arise in an industrial plant can be tested for training and educational purposes. "Hands on": learning by doing is still the most effective way to impart and anchor knowledge.

In addition, a training room for approx. 20 people is available in which theoretical lessons can take place and experiments can be evaluated and discussed.



REAL-LIFE EXPERIENCES AT OUR TEST FACILITIES OFFER A BRIDGE FROM THEORY TO PRACTICE



The facility offers ideal conditions for small and medium-sized experiments and is frequently used for training and further education.



A core element of our work is the extensive range of services we offer in terms of implementing and promoting water resource management in developing and emerging countries. Our services cover the entire water cycle and strive for sustainable, worldwide availability of water meeting high quality standards.



Learn, comprehend, act. Our "Tailor Made" option offers an extensive catalogue of modules on theoretical content, practical training units, excursions and e-learning, tailoring training courses to individual requests and requirements.



INTERNATIONAL COOPERATION

Sustainable water management is affected by a wide range of competing water uses, climate change and population development, which can only be addressed with an integrated approach, taking into consideration related disciplines such as agriculture, urban development, chemicals management, the completion of material lifecycles and, not least, our consumer behavior. For this reason, FiW works nationally and internationally with a broad network of partners on interdisciplinary research, consulting and transfer projects, in which we often also take on the coordination of projects as providers of ideas and as project developers.

Networking, successful project initiation and, not least, the interests expressed by our employees have led to FiW being more active in some countries and regions than in other, focusing international cooperation efforts on these geographical areas. In addition to projects in Germany, we are currently active in Pakistan (cotton textile industry), Thailand & Indonesia (Nexus Water-Nutrition-Energy) and China (managed aquifer recharge in the North Chinese Plain). International cooperation with the countries of the MENA region and the Maghreb has been an integral part of FiW's work for many years. For more information please visit www.cooperation-in-water.com



INTERNATIONAL COOPERATION HAS BEEN AN INTEGRAL PART OF FiW'S WORK FOR MANY YEARS



TRAINING & FURTHER EDUCATION

The transfer of knowledge, building the competence to work independently and the lifelong learning approach are the core values of training and further education at FiW. The approach is based on three pillars: teaching, national and international cooperation, and HR development.

- Accredited masters program for international students „Management and Engineering in Water“ under the academic supervision of the Institute of Environmental Engineering and in cooperation with the International Academy of RWTH Aachen and the Maastricht School of Management
- Excursions and direct exchange with experts
- Blended Learning in an international context
- On-site and virtual training
- Practical training

For further information please visit www.water-experts.com



WE OFFER SCIENTIFIC EXPERTISE GAINED FROM PRACTICAL EXPERIENCE IN NATIONAL AND INTERNATIONAL PROJECTS



Member of
ZUSE-GEMEINSCHAFT



GREATER PERFORMANCE THROUGH NETWORKING



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