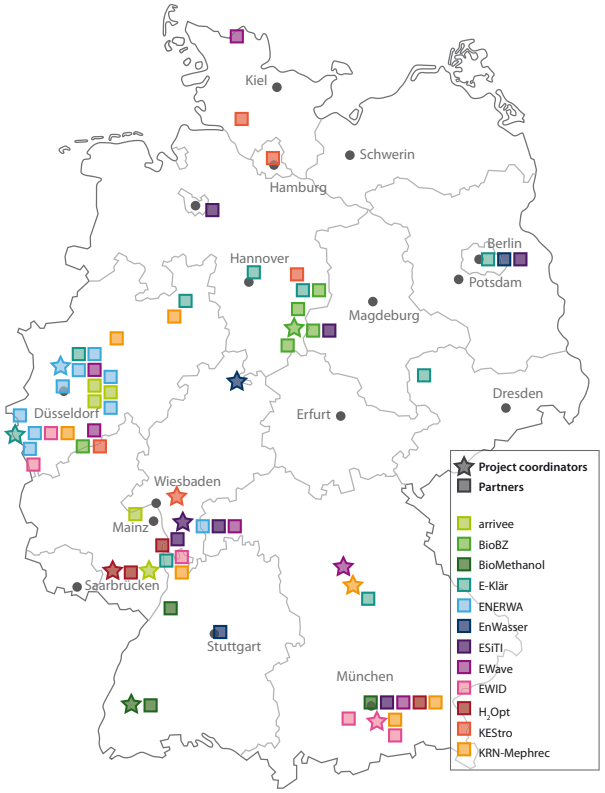
Research Sites



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KEStro	Dr. Klaus-Michael Mangold
KRN-Mephrec	Burkard Hagspiel

Joint Research Projects

arrivee	Wastewater treatment plants as control component in intelligent distribution systems with renewable energy generation
BioBZ	The bio-electrochemical fuel cell as a component of an energy-producing sewage treatment plant
BioMethanol	Sustainable synthesis of the energy-carrier methanol from waste water
E-Klär	Towards the energy-optimized wastewater treatment plant of the future – Development and model-based integration of innovative treatment technologies for transformation processes
ENERWA	Energy optimization of entire water supply chains from reservoirs-rivers • drinking water treatment • transport-storage-distribution
EnWasser	Demand Side Management in Water Supply Systems for the Integration of Renewable Energy Sources
ESiTI	Wastewater treatment plant of the future: Energy storage in interaction with technical infrastructure between the poles of energy generation and consumption
EWave	Energy Management System Water Supply
EWID	Energy Winning in Water Distribution Systems by Intelligent Pressure Management
H_2Opt	Interactive decision support for operation and energy management of water systems based on multi-objective optimization methods
KEStro	Wastewater treatment plants as energy storage systems for power grids
KRN-Mephrec	Sewage sludge utilization in Nuremberg. Pilot project to test the metallurgical recycling capacity - transforming sewage sludge into energy, fertilizer and iron in a single process step.

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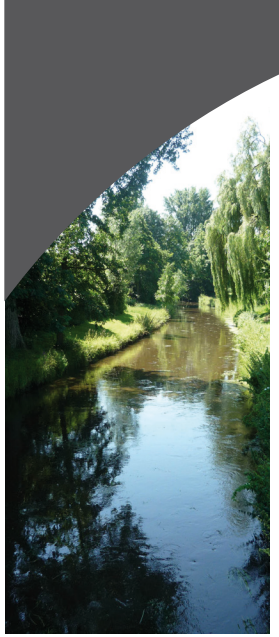
ERWAS

Future-oriented Technologies and Concepts for an Energy-efficient and Resource-saving Water Management (ERWAS)

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NaWaM ERWAS
FONA Sustainable Water Management BMBF

Future-oriented Technologies and Concepts for an Energy-efficient and Resource-saving Water Management (ERWAS)

Background

Water is an irreplaceable resource for mankind. The supply of water in sufficient quantity and quality as well as safe waste water disposal are among the most basic human needs. However, the management of this resource – from the supply of drinking water to waste water treatment – requires significant amounts of energy: the existing installations in Germany for public water supply and waste water treatment together consume 6.6 TWh per year of electrical energy, which is equivalent to the annual electricity needs of about 1,600,000 four-person households.

At 4.2 TWh per year, the sewage treatment plants are the largest consumers of electricity in the municipal sector and have higher power requirements than, for example, schools or street lighting. Through energy-saving measures and increased efficiency there is, however, an estimated savings potential of up to 25% of this power consumption.

In order to realise the above-mentioned savings potential and the production of energy from water management plants, innovative approaches are needed. This is where the funding programme "Future-oriented Technologies and Concepts for an Energy-efficient and Resource-saving Water Management" – ERWAS comes into play. The funding programme is part of the Federal Ministry of Education and Research (BMBF) funding priority "Nachhaltiges Wassermanagement – NaWaM" (Sustainable Water Management) in which the BMBF focuses its activities on the field of water research within the framework programme "Forschung für nachhaltige Entwicklungen" (FONA) (Research for Sustainable Development).

Objectives of the funding measure

Based on practical concepts and technologies, a contribution is to be made to the development of sustainable, energy-efficient water supply and waste water disposal. The focus here is on improving the energy balance and on resource-saving energy generation. In the case of waste water treatment, energy autonomy or even an "energy positive" supply situation could be achieved through innovative approaches. Furthermore, it is to be investigated how water management plants can be intelligently integrated into the water and energy infrastructure of the future.

Contents

Within the framework of the funding measure, the BMBF supports 12 joint research projects with partners from science, industry and practice.

A major focus of the funded projects is on the development of new concepts of interaction between the drinking water, wastewater and energy sectors. Examples include the use of the load management potential and the energy storage capabilities of the water sector for the future energy systems. Here, among other things, research is carried out into how water management facilities can play a balancing role as an energy source or sink given stronger fluctuations in the electricity supply from renewable sources (wind and solar power) in future.

Furthermore, innovative methods of energy production and energy conversion at water management facilities are to be developed, such as the optimised power generation in microbial fuel cells or conversion to methanol. The focus is also on finding new ways to improve realisation of the energy potentials in the sewage sludge with simultaneous utilisation of the resources contained in waste water, such as phosphorus.

In several collaborative projects, the use of the energy potential in water supply plants is in the foreground. One thematic focus here is in the area of process optimisation.

Torsten Fiedler/Stadtentwässerung Dresden GmbH

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