



DRINKING WATER

WASTE WATER

WASTE

ECONOMY

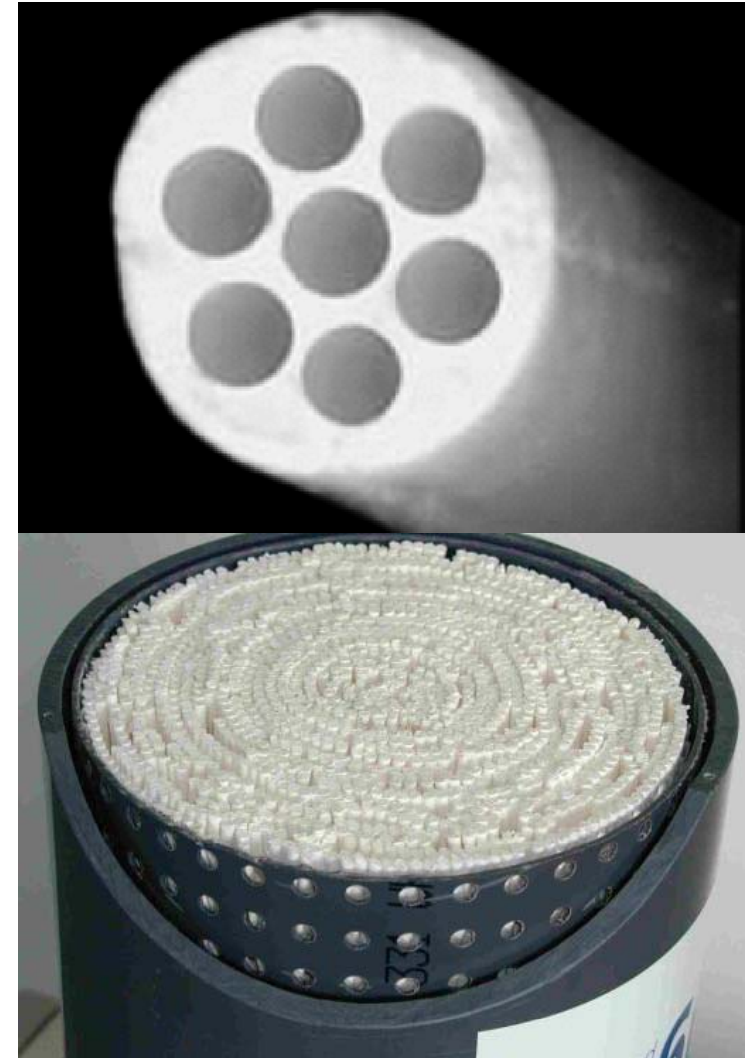
ULTRAFILTRATION

- research into application of ultrafiltration membranes for drinking water treatment since 1997
- introduction in Bavaria in small water works with need of particle and bacteria removal
- actual research focuses on predictability of fouling phenomena



ULTRAFILTRATION - OUR PILOT PLANT

- capacity up to 5 m³ / h
- can be equipped with modules of different manufacturers
- small dimensions – easy to transport by truck
- field-tested
- controllable via internet, semi-automated operation possible



WATER SAFETY PLAN

- overview over risk situations and methods of risk analysis
- identification, quantification and risk management of drinking water supply systems in situations, where the water supply could be restricted
- security service and alarm handling in water supply



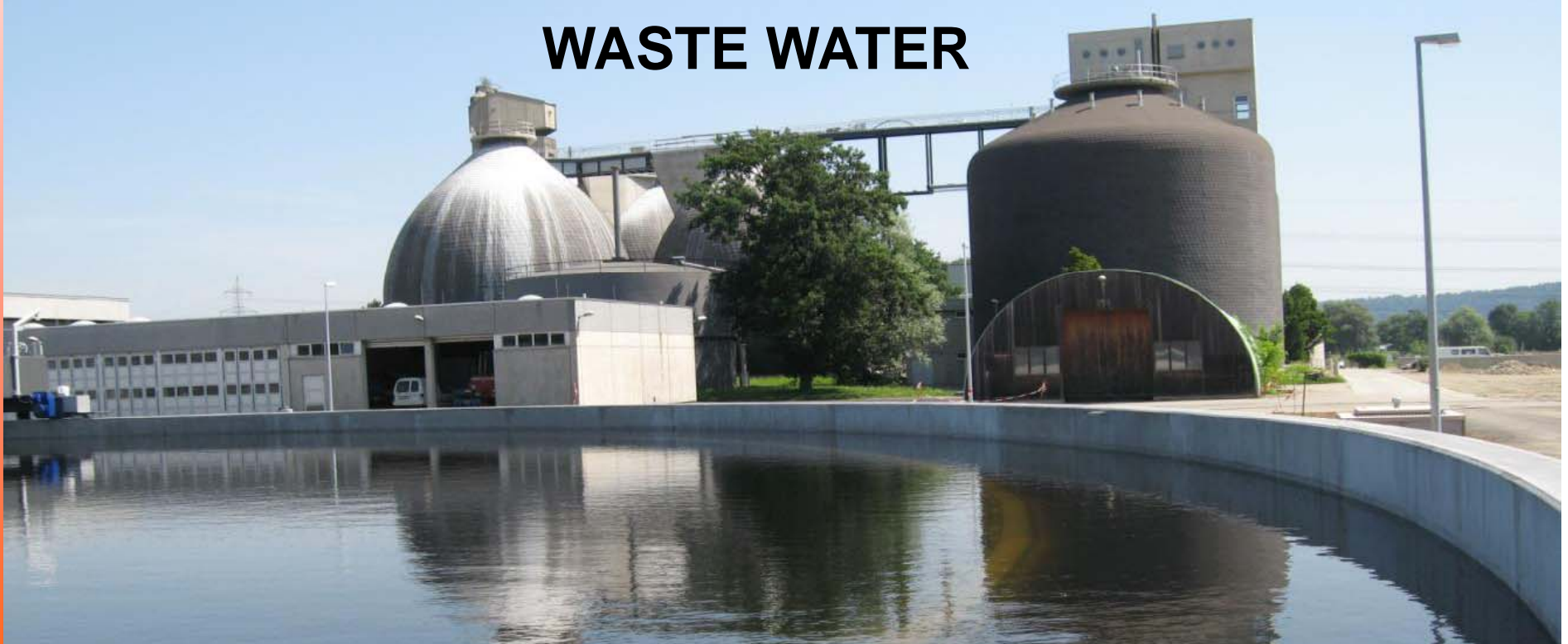
(Foto: Münchener Rückversicherungsgesellschaft)

DRINKING WATER – SELECTION OF FURTHER PROJECTS

- optimization of drinking water treatment
- safety and protection devices in Bavarian waterworks
- flood protection of water supply networks
- automatised laying procedure for pipe networks
- rate of self deaeration of pipelines
- analysis of water service planning in Egypt



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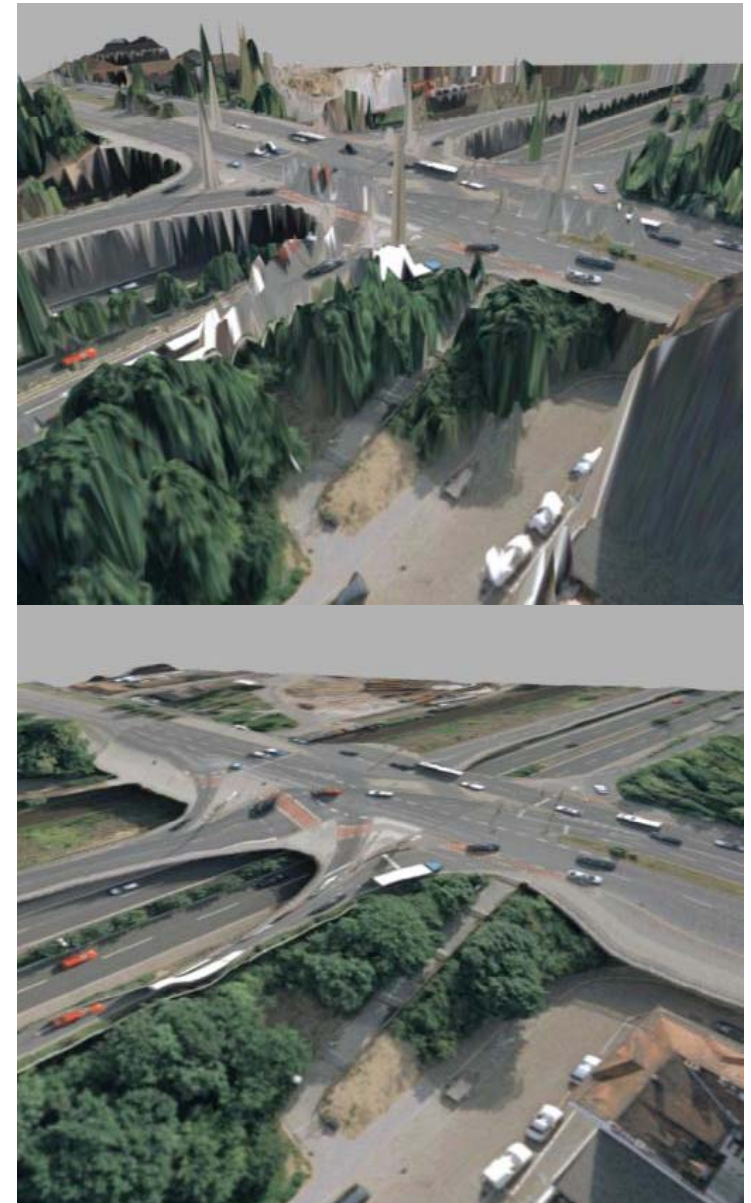
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SIMULATION OF URBAN RUNOFF AND SEWER FLOW

- optimization of the predictability of urban flooding caused by the sewer
- bidirectional hydro-dynamic coupling between 1D sewer flow and 2D/3D surface runoff
- air-born data collection with high resolution grid
- usage of multiple-core computers, fragmentation of the calculation steps



REHABILITATION OF PRIVATE SEWER SYSTEMS

- development of rehabilitation strategies for private sewer systems
- analysis and optimization of rehabilitation strategies
- analyses on damages for the sewer failures on the private sewer system
- improving the quality of service for the customers

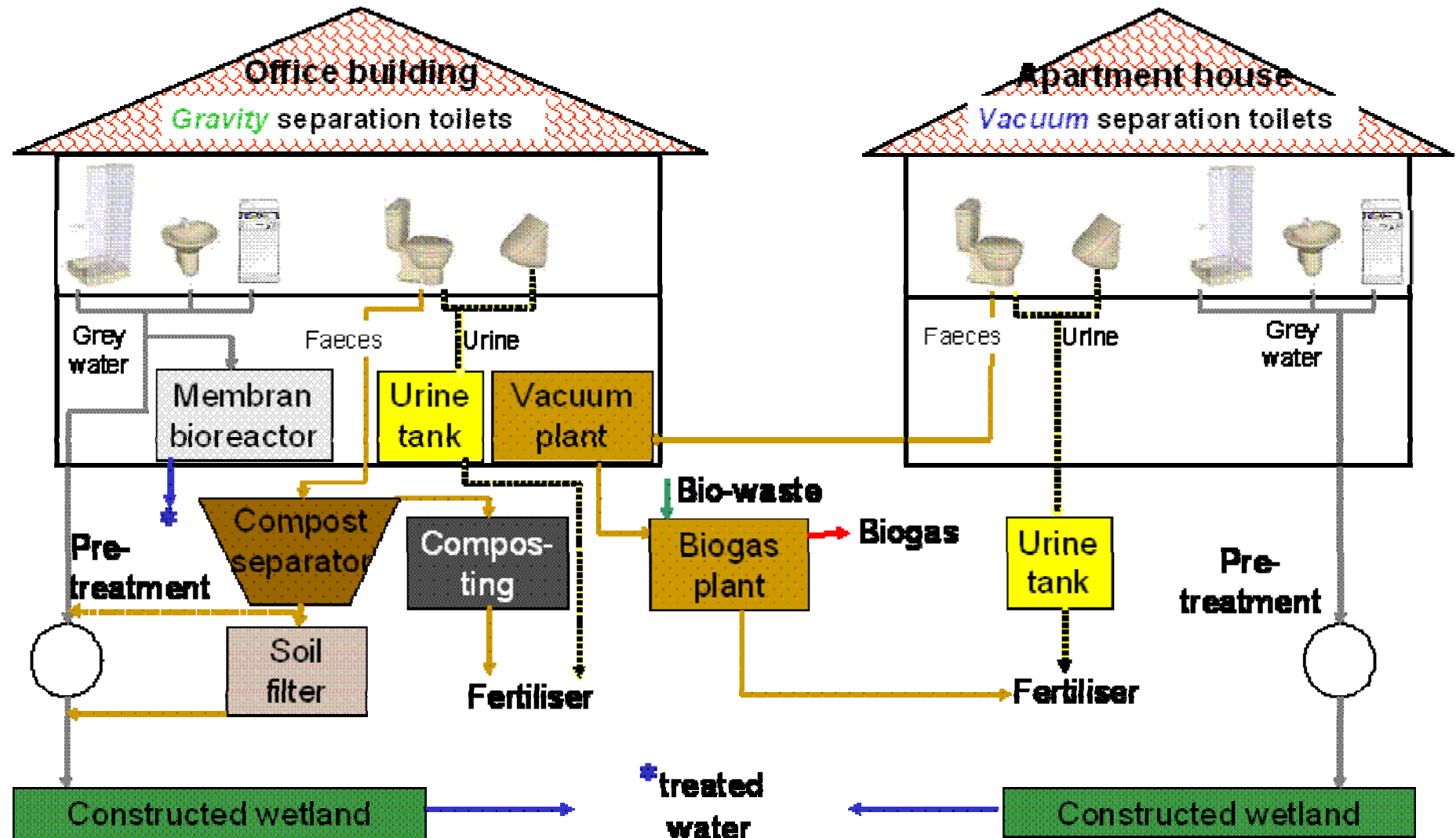


SPECIAL SEWER SYSTEMS

- using pressure and vacuum
- especially for application in rural areas
- test and compare of different drainage systems including economic aspects
- lower investment costs but higher operational costs
- long lifespan



WATER REUSE – PLANNED FOR YOUR CAMPUS



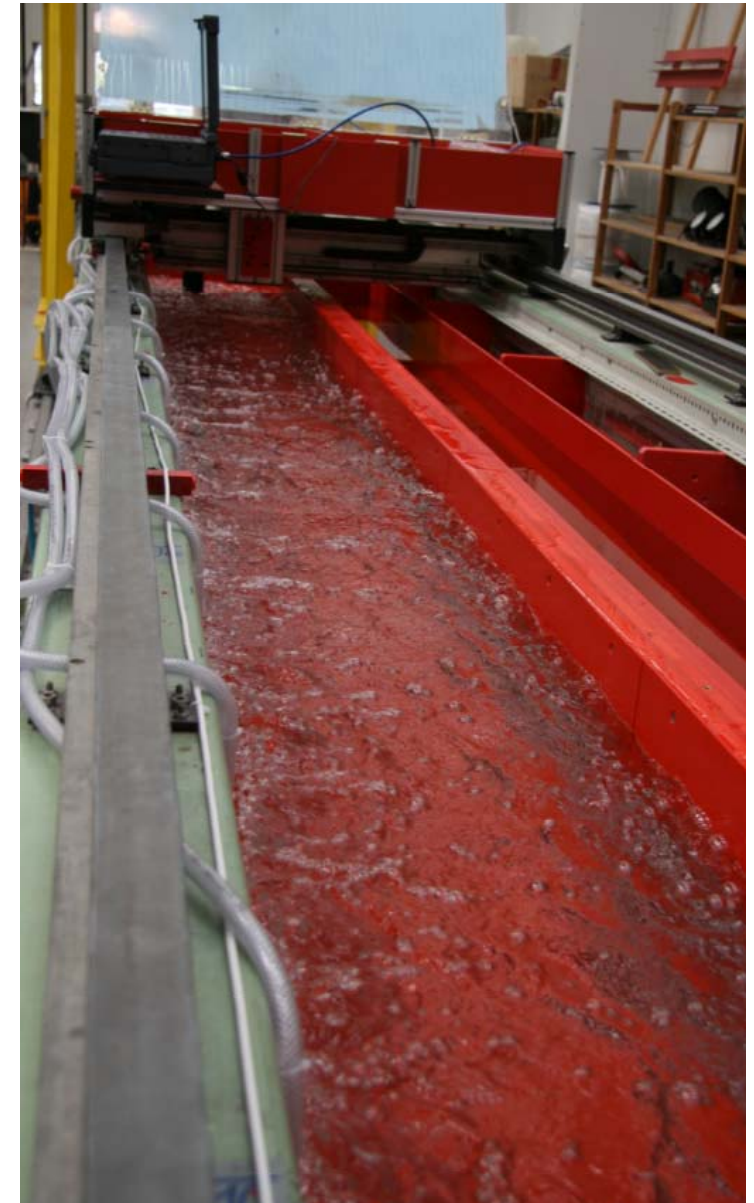
WATER REUSE AT HOTELS

- grey water recycling in hotels and restaurants
- application of innovative technical measures under ecological aspects
- use of an aeration plant with ultrafiltration and UV-desinfection
- significant reduction of fresh water supply and waste water
- testing of reuse for flush, irrigation, washing machine and dishwasher



GRIT SEPARATION

- grit separation is a big problem on WWTP's
- grit removal efficiency of aerated grit chambers is important
- measuring on WWTP's is difficult
- therefore a hydraulic model (5 x 1 x 0,8 m) has been built
- measuring of flow velocities and mass balances of separated sand



WASTE WATER – SELECTION OF FURTHER PROJECTS

- storm water management and treatment
- laying technologies for pipes
- odour problems in sewers
- application of self-compacting materials for bedding of pipelines
- prevention of infiltration water in sewers and WWTP's
- design and dimensioning of secondary settling tanks
- simulation and optimization of WWTP's
- membrane technology in waste water treatment

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SLUDGE TREATMENT IN HIGH MOUNTAIN REGIONS

- development of new methods of sludge treatment for special use at mountain shelters
- focus on reduction of sludge amount (transport and utilization problems)
- find customized solutions for different - already existing - systems by considering the special problems in high mountain regions



PRODUCTION OF FUELS FROM DRIED & PRESSED BIOMASS

- biomass from e. g. parks, road side, agriculture is a regenerative, CO₂ neutral energy source
- only a limited proportion (8 – 10 %) of available biomass is used for power generation
- with the planned “florafuel®” plant from florafuel AG, biomass -which has not yet been possible to use for incineration will be exploited for energy



WASTE – SELECTION OF FURTHER PROJECTS

- strategies for waste prevention
- aerobic and anaerobic stabilization of sludge
- disintegration of sludge by Ultrasound
- production and storage of Hydrogen on WWTP's
- emission and behavior of humic substances from sewage sludge mono landfills
- emissions from red mud mono landfills



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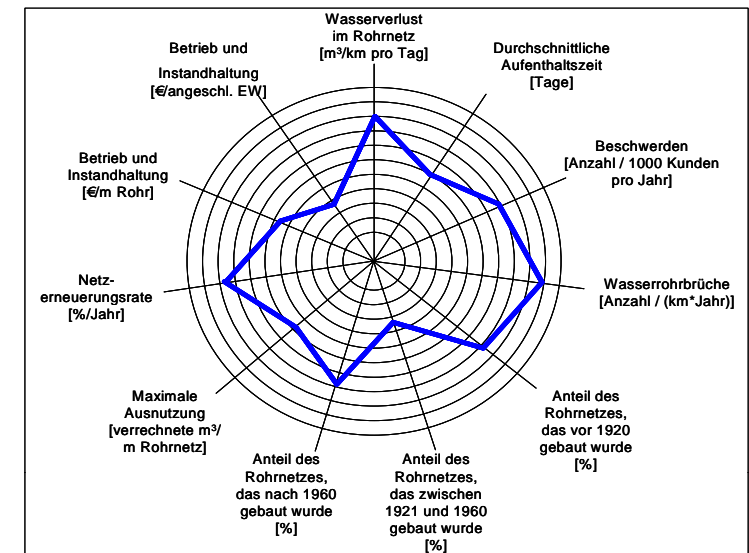
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BENCHMARKING

- comprehensive comparison of enterprises, projects, processes...
- continuous process
- Benchmarking for all areas of the water, e.g.
 - water supply
 - WWTP
 - dams
 - ...

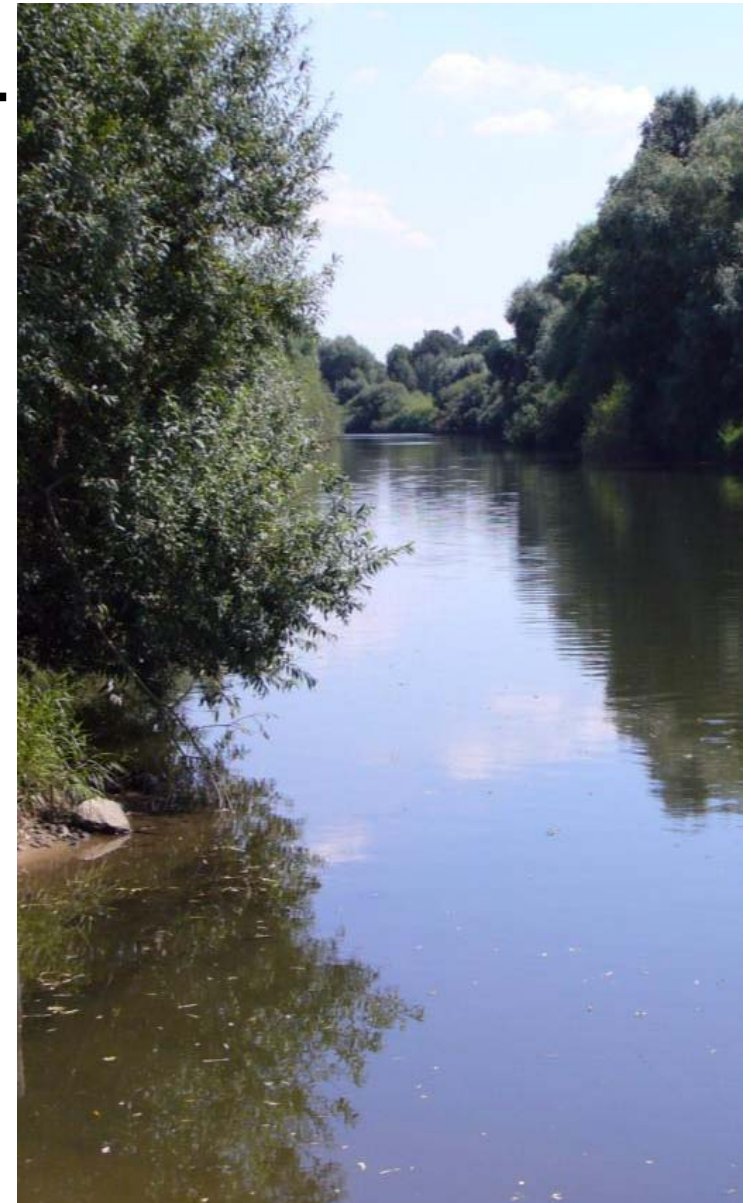


Different Working Stages

1. Preparation, Planning
2. Data collection
3. Identification Benchmarks
4. Analysis
5. Implementation

BENCHMARKING OF RIVER BASIN MANAGEMENT

- including all relevant processes of land and water use
- including relevant actors in the River Basin
- provision of legal regulations and presettings of european waterframework directive



ECONOMY – SELECTION OF FURTHER PROJECTS

- cost-effectiveness and benchmarking in water supply systems
- costs, cost-effectiveness and benchmarking for waste water drainage systems
- costs, cost-effectiveness and benchmarking of WWTP's
- Benchmarking of the morphological and structural quality of aquifers