DVGW Innovation Programme Water

Deutscher Verein des Gas- und Wasserfaches e.V.

DVGW

www.dvgw.de/ipw

DVGW Innovation Programme Water

Overview of the research projects

Publisher
DVGW Deutscher Verein des Gas- und Wasserfaches e. V.
Technisch-wissenschaftlicher Verein
Josef-Wirmer-Straße 1–3
53123 Bonn

Phone: +49 228 9188-5
Fax: +49 228 9188-990
E-mail: info@dvgw.de
Internet: www.dvgw.de

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DVGW Innovation Programme Water

Overview of the research projects

As of March 2023

Foreword

Water is the basis of all life but represents also one of the greatest challenges of our future. Climate change, increasing scarcity of resources and increasingly frequent water contamination contrast the self-perception of a water supply that has been flawlessly operating for decades. Already today, the water industry in Germany is confronted with enormous challenges, which it faces with great dedication but is unable to solve on its own. To set up a viable water supply for the future both in terms of safety and quality requires a change in thinking and new approaches for the management of the precious commodity water.

The DVGW Innovation Programme Water constitutes an important step in this regard. As the DVGW, we are responsible for lastingly assuring the high security of supply and drinking water quality today and in the future. In view of the challenges, we consider this to be a task for society as a whole, the solution of which presupposes a general consensus. Therefore, we have made it our goal, together with our partners at the water suppliers, in science and in politics, to develop and implement innovative concepts and solutions for a sustainable water industry within the scope of the DVGW Innovation Programme Water. We are convinced that we can create a future-viable and sustainable water industry through committed cooperation and the consistent use of cutting-edge technologies and methods. Together we can make our contribution to a reliable, safe and sustainable water supply that we will also be able to count on in future.

The brochure at hand provides you with an overview of the most important aspects and action steps of the DVGW Innovation Programme Water. We provide you with information on current challenges and illustrate how we can meet them.

I trust that this brochure has interesting knowledge in store for you and provides you with insights into the exciting and important work of the DVGW. I would like to take this opportunity to sincerely thank everyone who contributes to the success of the DVGW Innovation Programme Water and look forward to continuing our successful cooperation.

Wolf Merkel
DVGW Board of Directors Water

Picture: © DVGW

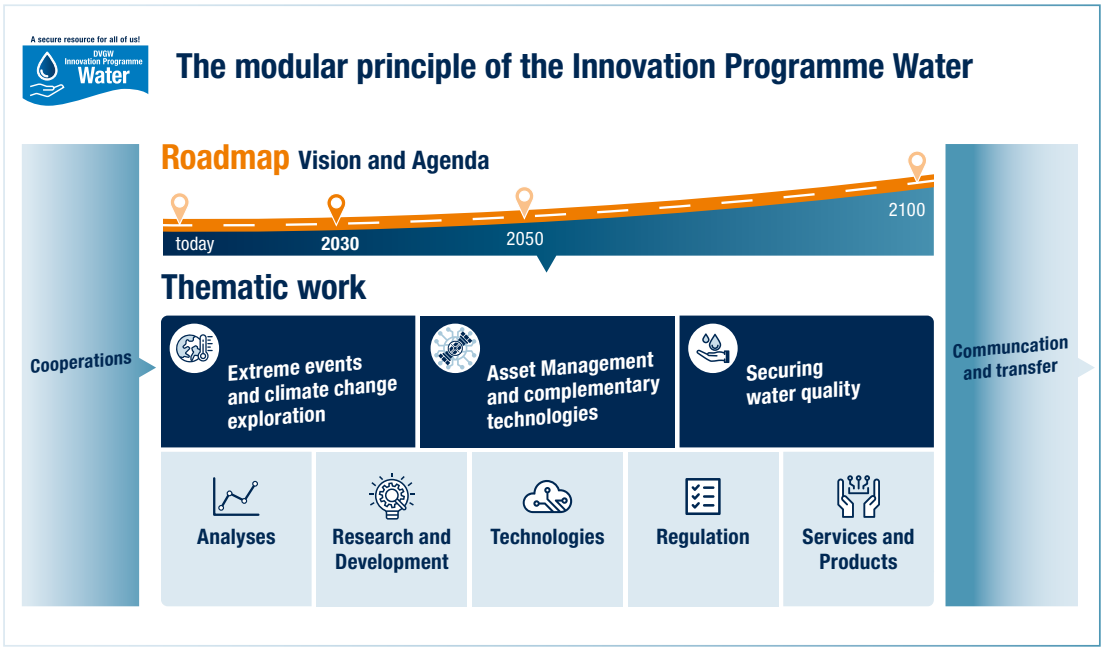
“To secure the long-term supply of high-quality drinking water, our most important food, we need future-proof solutions. The DVGW makes an important contribution towards this with the Innovation Programme Water.”

The DVGW Innovation Programme Water – research for a future-proof water supply

The challenges involved in guaranteeing a safe water supply in Germany are clearly on the increase. The effects of the climate change together with societal, political and economic changes will have a considerable impact on the future water supply. Changes to the usable water resources and fluctuations in the water demand due to the ongoing demographic change, increased claims for use on resources that are becoming potentially scarcer at a regional or temporal level and an increasing consciousness regarding a more sustainable use of the water resources require a flexible adaptation of the water industry's infrastructures. Already today, this poses enormous challenges for the industry. These must continue to be identified and analysed at an early stage in the future too to still be able to derive need-based measures and concrete solutions for all stakeholders involved.

For this purpose, the DVGW has launched the DVGW Innovation Programme Water in 2021. By target-oriented research for location determination, by closing knowledge gaps and deducing concrete courses of action for the water industry, this programme brings together the working fields research, technical work and rule making, strengthens cooperations and takes into consideration the communication and transfer of the results from the word go.

One of the core elements is the work with specialist topics in the three fields of innovation “Extreme events and climate change exploration”, “Asset management and complementary technologies” as well as “Securing water quality”. The thematically linked research projects are provided with individual work programmes where the programme modules “Analyses”, “Research and Development”, “Technologies”, “Regulations”, “Services & Products”, “Cooperation” and “Communication and Transfer” are taken into account. In the



overarching programme module “Roadmap”, orienting guidelines in terms of content and professional policy are compiled for the work of the DVGW. With this outward opening and the simultaneous active integration and networking of relevant social and political stakeholders and knowledge bearers, additional value and impulses for working on specific technical topics are generated. At the same time, communication of the results and the messages to the target groups derived from these results is ensured in a timely manner.

Beyond the national level, the programme makes an important contribution towards reaching the UN Sustainable Development Goals (SDGs) and towards the priorities of the European Commission and the “Green Deal”.

Research projects in the DVGW Innovation Programme Water

ROADMAP 2030 – A STRATEGY FOR FUTURE CHALLENGES

EXTREME EVENTS AND CLIMATE CHANGE EXPLORATION

ASSET MANAGEMENT AND COMPLEMENTARY TECHNOLOGIES

SECURING WATER QUALITY

Roadmap 2030 – A strategy for future challenges

In view of societal, political, economic and technological changes, the water supply faces great challenges in the long term. To be able to provide sufficient drinking water of high quality also in the future, new requirements must be recognised early on and structured recommendations for action derived from them.

For this, a consensual, realistic and positive future vision for the water supply in Germany in the year 2100 will be developed in the course of a stakeholder process from which the “Roadmap 2030” will then be derived. With this, trends and drivers of the change in the water supply are to be mapped in a structured manner and their impacts on the water demand and resources and on the infrastructures in Germany is to be described. The results are then merged into a big picture demonstrating possible development paths and illustrating relevant control parameters.

Picture: © AdobeStock/ dzmitrock87

Roadmap 2030

Completion 07/2023

PROJECT NAME

Roadmap – Future of water supply

GOAL

Early detection and analysis of new requirements and challenges the water supply is facing in view of societal, political and technological changes in a long-term perspective. From this, deriving structured needs for action and valid options for action as well as developing monitoring for a future-viable water supply.

BACKGROUND

The challenges the water industry in Germany is facing are constantly increasing. Whether climate change, demographical and societal changes or an aging infrastructure – all this has a direct or indirect impact on future water resources and needs. The requirements on the operation, the necessary adaptations of the infrastructures or the quality development of raw waters from different sources are all undergoing changes. A drinking water supply that is secure in terms of quality and quantity must nevertheless be guaranteed.

APPROACH

- Forecasting: Mapping the status quo, identifying trends and changes
- Vision: Developing a consensual and positive future vision for the water industry in the year 2100
- Backcasting: Evaluating the challenges to the water industry, conducting case studies
- Agenda: Compiling an agenda for action for the water industry up to 2030

PROJECT PARTNERS

Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e. V.
Institut für Zukunftsstudien und Technologiebewertung
DVGW-Technologiezentrum Wasser
IWW Rheinisch-Westfälisches Institut für Wasserforschung
IKU_DIE DIALOGGESTALTER

GO TO PROJECT

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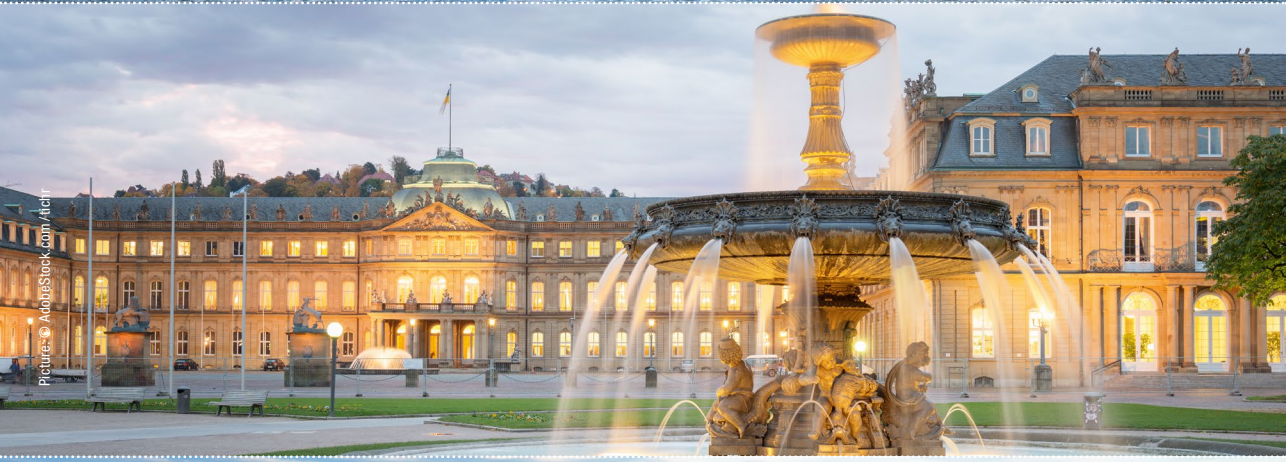

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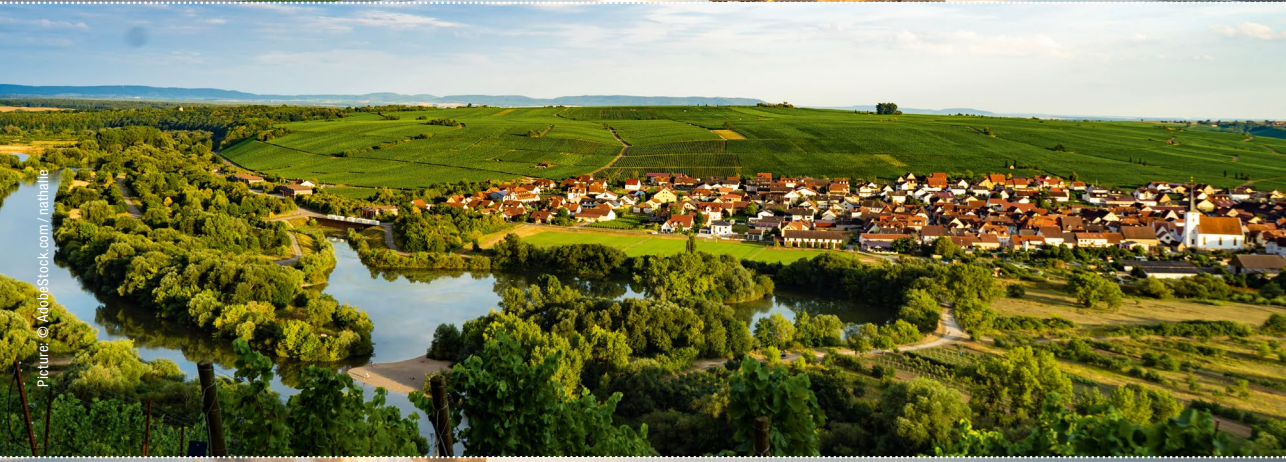

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Case Studies

Hamburg, completion 07/2023 • Stuttgart, completion 07/2023
Franken, completion 08/2023 • Magdeburg, completion 01/2024

PROJECT NAME

Roadmap – Future of water supply: Case studies in Hamburg, Stuttgart, Franken and Magdeburg

GOAL

Testing the approach and methodology derived from the DVGW project “Roadmap 2030” for the water industry in practical applications in urban and rural areas while taking into consideration the geographical location in Germany.

BACKGROUND

To understand the societal, economical, political and ecological change in its correlations, dynamics and impacts on future water resources and needs for the water supply and to link it with an agenda for action, the DVGW has compiled the “Roadmap 2030”. Based on case studies conducted in Hamburg, Stuttgart, Franken and Magdeburg, application of the roadmap methodology is tested in practical application.

APPROACH

Along the lines of the approach followed in the research project for the nationwide Roadmap 2030, the case studies also follow a four-stage workflow:

- Compiling the basic information
- Analysis of trends and changes
- Backcasting
- Transferring the results into needs for action, milestones and actions in an Agenda 2030.

The results of the case studies then flow into the superordinate Roadmap 2030 of the DVGW Innovation Programme Water.

PROJECT PARTNERS

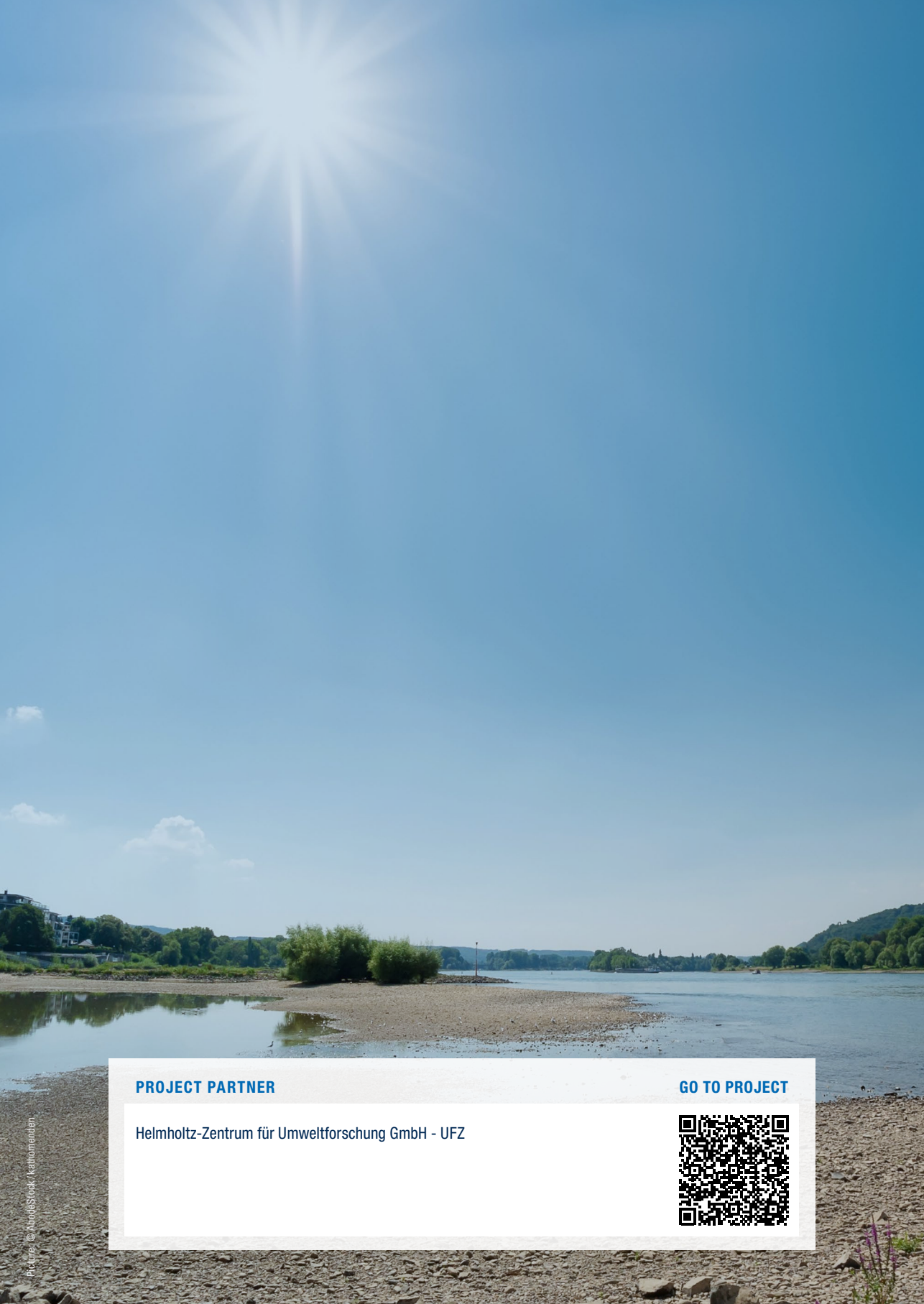
IWW Rheinisch-Westfälisches Institut für Wasserforschung
DVGW-Technologiezentrum Wasser
HAMBURG WASSER
Zweckverband Bodensee-Wasserversorgung
Zweckverband Landeswasserversorgung
Netze BW
Landeshauptstadt Stuttgart
Fernwasserversorgung Franken
Trinkwasserversorgung Magdeburg

GO TO PROJECT

Extreme events and climate change exploration

The consequences of the climate change are noticeable – also in Germany. Dry years and flood disasters have made this apparent. Intensity and frequency of the occurring events and their aftereffects are a central element under the topic of “Extreme events and climate change exploration”. Because this type of extreme events and their effects also do not leave the water supply unaffected and require adaptive measures.

To permanently secure the water supply, it is necessary to provide practically relevant data and data collection systematics which are compiled in individual projects. Furthermore, it is intended to develop management concepts and tools, to be able to better understand and forecast the dynamics and cycles of climate change and the influences on the water supply. Forecasts with regard to availability and demand and models for water supply concepts complete the picture.



PROJECT PARTNER

Helmholtz-Zentrum für Umweltforschung GmbH - UFZ

GO TO PROJECT

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Wasserdargebot

Completed 01/2023

PROJECT NAME

Compilation of an information basis for climate-induced changes in the water supply

GOAL

Quantitative survey of the water availability in Germany for the coming years.

BACKGROUND

In Germany too, the global climate change has an effect on influencing factors that are important for the water sector. These include for instances changing average temperatures and severity of heat waves, but also changes in precipitation or in groundwater recharge. These can influence the availability of water.

APPROACH

- Water stress and aridity
  - Comparison of the climate projections of the UFZ with others of the Deutscher Wetterdienst, the Forschungszentrum Jülich and the KLIWA Group
  - Compilation of two comprehensive, high-resolution climate scenarios detailing the changes to the climate and hydrological balance (climate protection and “Continue as before”)
- Roadmap approach: Water supply 2030
  - Quantification of the relevant change factors for the water supply (here: future availability of water in different parts of the country, climate developments) to derive water demands for drinking water, irrigation, etc.
  - Implementation of three case studies
  - Spatial consideration of ten river basin units and thus almost the entire area of Germany
  - Evaluations of the climate variables and selected hydrological indices and indicators

RESULTS

As an overall result, all climate projections show comparable tendencies with regard to temperature, aridity, precipitation and groundwater recharge. The greater the climate change, the more pronounced these tendencies are and the extremes are on the increase. For Germany, this generally signifies that even under the climate protection scenario, the climate-induced changes will continue to advance approximately until the middle of the century and will then stabilise, while under the “Continue as before” scenario, the changes will continue to progress up to the end of the century. The median of changes across all climate simulations is the most probable development and is thus suitable as point of reference for the climate adaptations in water supply. According to this, the median of terrestrial water availability, i.e., precipitation minus current evaporation, increases slightly in both climate scenarios.


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WatDEMAND

Completion 06/2023

PROJECT NAME

Multi-sectoral water demand scenarios for Germany and assessment of future regions with increasing water scarcity

GOAL

Spatially resolved forecast for Germany of the multi-sectoral water need of households, industry and agriculture up to the year 2100 and blend of the water requirement prognosis with the modelled climate changes from the research project “Water availability” to identify so-called “hot-spot regions”.

BACKGROUND

The dry and hot summers of the years 2018 to 2020 have demonstrated that, already today, the German water supply can run into temporary regional bottlenecks. Climate change projections show that such basic climate conditions can even get worse in the near and remote future. The consequences that could result for the water supply in Germany from the global climatic and demographic-technological changes is to date still open.

APPROACH

- Literature study and basic principles of the water demand in Germany
- Water demand prognosis
- Evaluation of the water availability scenarios
- Deduction of regions with water scarcity

PROJECT PARTNERS

IWW Rheinisch-Westfälisches Institut für Wasserforschung
DVGW-Technologiezentrum Wasser
Universität Hohenheim

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DVGW-Technologiezentrum Wasser

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VERTIKAL

Completed 03/2023

PROJECT NAME

Conflict potential analysis and options for action in terms of agricultural irrigation and public drinking water supply

GOAL

Compilation of previous findings regarding the conflict zone between water management and agricultural water demand, querying and evaluating possible conflict potentials, examination of alternative water resources or measures for dealing with ground water more efficiently in the event of competing uses.

BACKGROUND

Already today, the water demand of agriculture and public drinking water supply leads to a strained water balance in many places. The reasons for this are a changed land use and the climate change. If the water demand continues to rise due to revenue optimisation and rising per-head consumption, agriculture and public drinking water provision could come into conflict in some regions.

APPROACH

- Definition of two “focus regions” with water supply conflicts to be assumed for the future
- Literature research of conflict mitigation approaches and description of their feasibility
- Interviews with stakeholders within the focused regions regarding their experiences of already successfully implemented measures and appraisals of future developments
- Compiling a package of measures for the early detection and avoidance of water usage conflicts in connection with irrigation

RESULTS

As a result of the research project, a concept paper on successful conflict management was prepared. In this paper, the necessary requirements, but also possible actions of the individual stakeholders (agriculture, regulatory authorities, water suppliers) were compiled. The paper is to assist in working out case-specific solutions. The core points of a low-conflict or conflict-free management of the resource ground water include among others (1) a resilient planning basis with quantitative information on local water management, including all withdrawals of groundwater and their utilisation, (2) participative planning processes, (3) the availability and financial feasibility of alternative water sources as well as (4) the association of farmers in a union that organises irrigation and coordinates it with the regulatory authorities.

CARB(H_2O)N

Completed 04/2023

PROJECT NAME

Tools on the path to climate neutrality of the water supply

GOAL

Purposeful processing of the current state of knowledge in the area of greenhouse gas balancing in the water supply to support the development of a standardised procedure for the index-based determination of emissions.

BACKGROUND

In countries such as Germany, a large portion of the overall consumption of fossil sources of energy can be traced back to industrial enterprises. In the public's perception, they are therefore ascribed a special role in reaching the climate goals. Due to the increased public interest and the high political pressure, companies in the water industry too see themselves increasingly compelled to intensively deal with the topics “Energy saving”, “Energy efficiency” and “Climate neutrality”.

APPROACH

- Drafting a proposal for a glossary of terms on climate neutrality taking into consideration the ISO standardisation
- Description and interpretation of the contents of the ISO standardisation on climate neutrality, with a view to the water supply industry, subdivided into the following topics
- Proposal for a pragmatic definition of the term “climate neutrality of the water supply”
- Definition of the structure of a useful handout/survey aid for further development for the water supply

RESULTS

The results will be published on the web page www.zukunftsprogramm-wasser.de.

PROJECT PARTNERS

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DVGW-Technologiezentrum Wasser

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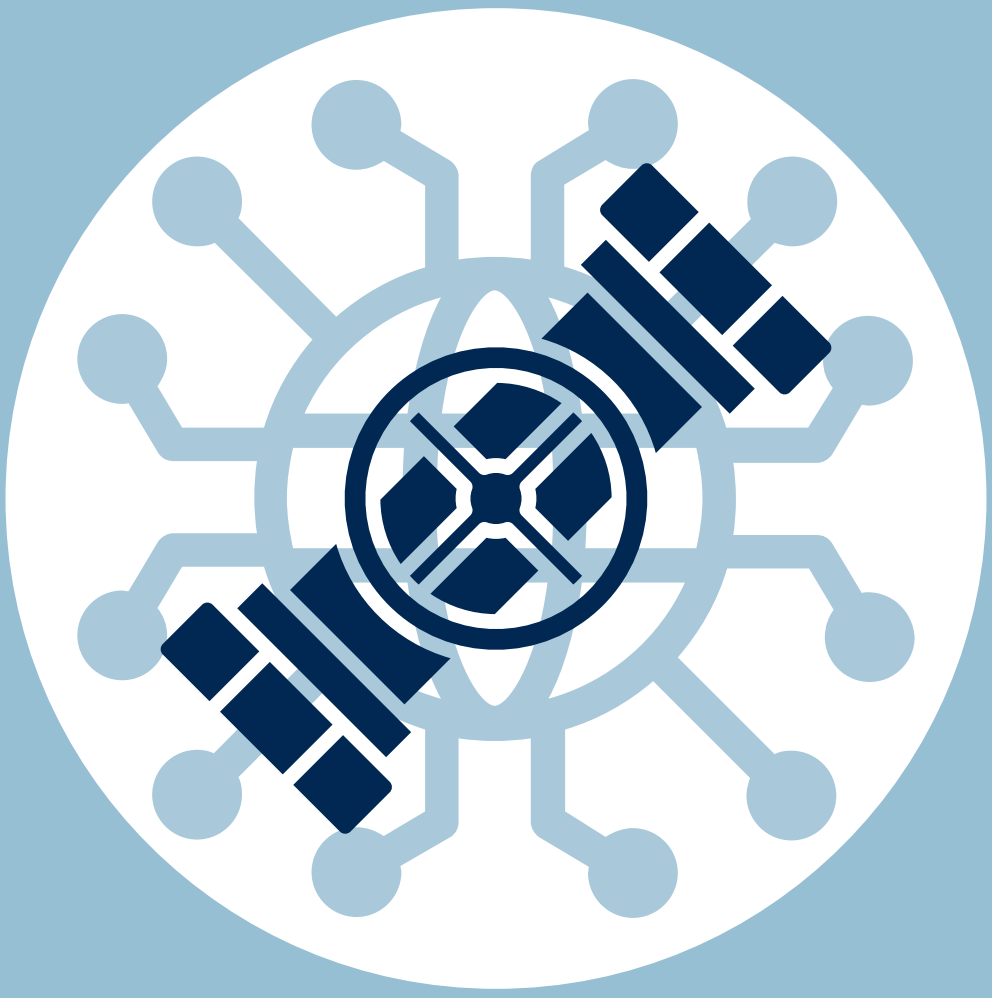

Asset management and complementary technologies

Great challenges facing the water supply in coming years are the preservation of the values and structures of the drinking water infrastructure and its adaptation. Due to the changed basic parameters or usage scenarios and their influence on the future water infrastructure, an integrated asset management with supplementary technologies, for instance digitisation, at large and small water suppliers is essential for coping with the complex tasks ahead.

The water supply is in need of suitable instruments to preserve the value of the existing infrastructure. Adaptation of the existing supply system to changed supplies and required quantities as well as increased resilience requirements for a future-proof infrastructure necessitate analyses, innovations and practical testing of new technologies, diagnostic tools, and data-based system solutions.

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TRINK-ASSET

Completed 09/2022

PROJECT NAME

Asset management: Investigation of the necessity and implementation options for collaborative data platforms for water suppliers

GOAL

Clarification of requirements, opportunities and risks of a collaborative data platform for the asset management of drinking water suppliers.

BACKGROUND

Asset management is a fundamental component of the substance-oriented preservation and sustainable, resource-optimised operation of the existing water infrastructure and is considered a key factor for a drinking water supply that continues to remain sustainable, affordable and safe in the future. However, its introduction and implementation often confront water suppliers with the challenging situation that their own databases are outdated and on top of that stored in peripheral structures. Thus, decisions are mainly taken based on the water suppliers' own stored data and rarely in consideration of third-party data.

APPROACH AND RESULTS

- Anonymised online survey
- Supplementary in-depth interviews

RESULTS

It was possible to confirm a general requirement for a collaborative data platform and to identify and prioritise the requirements on software functions.

PROJECT PARTNERS

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DVGW-Technologiezentrum Wasser

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GO TO PROJECT

INNO-SANITECH

Completed 11/2022

PROJECT NAME

Assessment of innovative rehabilitation technologies in drinking water distribution

GOAL

Provision of a systematic overview on the best available technology in terms of rehabilitation methods, description and assessment of the effectiveness of technologies, demonstrating knowledge gaps within individual methods, supporting the decision-making processes regarding the selection and assessment of systems, providing an impetus for the extension or adaptation of rehabilitation technologies as well as working out the basic principles for further research lines on this topic.

BACKGROUND

The water infrastructure is comparatively long-lived. A large portion of today's drinking water network was constructed or for the last time fundamentally refurbished during the 1950ies and 1960ies. As this generation of pipework will soon have reached the average expected useful life of 62 years, at least 47,000 kilometres or 11 percent of the entire network will have to be replaced or rehabilitated in the years ahead. To know which pipe sections are concerned, water suppliers have to assess the capacity and the remaining useful life of the pipelines and pinpoint weak points as accurately as possible, because rehabilitation methods by which affected sections can be precisely identified could considerably reduce the expenditure involved.

APPROACH AND RESULTS

- Literature and industry research
- Online survey among water supply companies on the state of rehabilitation and renewal of drinking water lines

RESULTS

It was possible to gain insights on the current best available technology in terms of rehabilitation methods and the use of methods for the selective internal repair of drinking water, sewage as well as oil and gas lines. In the course of this, appraisals of the technology suppliers regarding the efficiency and degree of maturity of such methods were gathered. Beyond that it was possible to determine experiences with and requirements on innovative rehabilitation methods.

PROJECT PARTNERS

IWW Rheinisch-Westfälisches Institut für Wasserforschung
DVGW-Technologiezentrum Wasser

GO TO PROJECT

Digi-Tools

Completed 03/2023

PROJECT NAME

Digital solutions for asset management in the water supply

GOAL

Closing existing knowledge gaps with regard to digital tools and description of a defined target vision for asset management in the water supply.

BACKGROUND

Ageing infrastructures and changed circumstances currently present major challenges for the sustainable asset management in the water supply. The substance-oriented value preservation of existing systems is crucial in guaranteeing the security of supply. Modern methods and technologies can assist in gaining a comprehensive picture of the state of the infrastructure. Digitisation has an important role to play in this. By now, many digital tools for asset management are available on the market, ranging from geoinformation systems, maintenance management systems, facility information systems to enterprise asset management applications. However, the industry is partly suffering from knowledge deficits or is lacking an overview of the diversity of possible applications and their potentials.

APPROACH

- Deficit analysis
- Derivation of potential requirements on digital solutions
- Focussed market research
- Comparison of the results with practical application

RESULTS

To provide practitioners and those responsible at the water supply companies with an orientation with regard to the variety and diversity of solutions for the use of digital tools, an interactive tool map was developed that offers a structured overview, broken down according to the processes of technical asset management. In the status paper, “Digital solutions for asset management in the water supply”, the essential project results are prepared and summarised.

Securing water quality

The water supply industry in Germany is committed to ensuring that the use of drinking water for human consumption does not pose any danger to health. Even in times of an increasingly more pronounced climate change with a rapidly changing usage behaviour and increasing contamination of water resources, this aspiration must be maintained as the highest premise.

New developments in treatment technology, trace analysis and digitisation on the one hand result in challenges and discussions, but on the other hand offer new options and opportunities. For this conflict area, this subproject provides an overview with new technological and methodical courses of action. Focal points are the early detection of chemical and microbiological hazards, the evaluation and interpretation of new substances and the development of an aligned risk management and new digital tools.

KLIWAQ

Completion 12/2023

PROJECT NAME

Study on the impacts of climate change on water quality

GOAL

Improving the water suppliers' level of awareness of the effects of the climate change by means of practical recommendations for action on how to sustainably secure the water resource usage.

BACKGROUND

The frequency and intensity of extreme events does not only have an effect on the quantity of water that is available as drinking water, but also on the water quality. This concerns both the chemical composition and the microbiological parameters. Until now, management strategies have strongly focused on the aspect of quantity. However, the water quality plays just as important a role for a sustainable supply: This is because the treatment of severely contaminated raw water is associated with a clearly higher effort and additional costs for the water industry. The consequences would in turn be increasing costs and an impairment of the drinking water supply.

APPROACH

- Literature research and aggregation of the state of knowledge on the effects of the climate change on water and raw water quality
- Survey among water supply companies to identify their view on future challenges and to describe to what extent the individual water industry resources are affected
- Workshop with involved water suppliers and professional bodies to assess and prioritise results obtained from the previous work packages
- Networking and knowledge transfer to generate synergies and to place the gained insights into a practical context

PROJECT PARTNERS

DVGW-Technologiezentrum Wasser
IWW Rheinisch-Westfälisches Institut für Wasserforschung

GO TO PROJECT

Picture: © depositphotos.com/kovalvs

QUOVADIS-LAB

Completed 04/2023

PROJECT NAME

New roadmap describes future requirements on the drinking water metrology

GOAL

Compilation of an analytics roadmap that outlines the most important technology developments of the future.

BACKGROUND

Owing to modern analysis and laboratory technology, the drinking water quality in Germany is excellent. However, new statutory regulations such as the EU Drinking Water Directive or the Water Framework Directive result in complex requirements on the chemical analysis. Sensitivity and specificity of the methods will become more prominent as well as the necessity to also examine extremely polar substances and to detect persistent mobile and toxic substances (PMT). Alternative monitoring concepts such as the non-target or the effects-based analytics (WBA) offer potentials in this regard.

To ensure the water industry is able to adequately meet the future challenges it is necessary to recognise new trends and the demand in the field of drinking water monitoring early on.

APPROACH

- Aggregation of existing and relevant literature on this topic
- Survey among manufacturers on the latest worldwide developments and standardisation activities

RESULTS

The results will be published on the web page www.zukunftsprogramm-wasser.de.

PROJECT PARTNERS

DVGW-Technologiezentrum Wasser
IWW Rheinisch-Westfälisches Institut für Wasserforschung

CO-FINANCING

figawa - Bundesvereinigung der Firmen im Gas- und Wasserfach e.V.
GERSTEL GmbH & Co. KG

GO TO PROJECT

TRINKControl

Completion 10/2024

PROJECT NAME

Case study on the use of different online analysis systems for the operational monitoring of drinking water treatment

GOAL

Derivation of advantages and disadvantages compared to measurements used on a standard basis, statements on the future use of neuronal algorithms and on the quality assurance of online analysis devices.

BACKGROUND

By international comparison, the drinking water in Germany is of excellent quality. Requirements are accordingly high. Suitable strategies and measures and the use of modern technologies are required to maintain the high quality of drinking water also in the future, Against the background of new challenges, the water industry also relies on digital instruments. Furthermore, online procedures or methods are increasingly used in drinking water treatment. However, in the field of microbiology, only few measuring principles are eligible as online analytical method. So far there is still a lack of insights on the potential of online analytical methods and devices for the automatic control of treatment processes in the drinking water supply, especially in the field of microbiological monitoring.

APPROACH

- Literature research
- Collation of the experiences with online monitoring already gained by water supply companies
- Practical testing of selected innovative microbiological methods in several waterworks

PROJECT PARTNERS

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IWW Rheinisch-Westfälisches Institut für Wasserforschung

GO TO PROJECT

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Neobiota

Completion 12/2023

PROJECT NAME

Relevance for the water supply and approaches to deal with the consequences

GOAL

Determining the current state of knowledge on the present occurrence of non-indigenous species in bodies of water and compilation of the effects on the drinking water supply.

BACKGROUND

Over the last decades, European waterbodies have seen an increased occurrence of novel animal and plant species (non-indigenous species). These can lastingly change the ecosystems and also lead to problems in the water supply systems. Non-indigenous species and especially non-indigenous animals can thus present a potential danger for the drinking water supply, not only in terms of quality but in particular in terms of the operation of the extraction and pumping equipment and treatment stages.

To be able to proactively face this danger requires information on the present state and future developments. These must be assessed with regard to their impacts on the drinking water supply. Finally, suitable counter-measures must be identified and examined with regard to their feasibility.

APPROACH

- Literature study on the current state of knowledge
- Exchange with experts and water supply companies
- Compilation of the insights and elaboration of adaptation strategies
- Networking and knowledge transfer through the involvement of the different professional bodies

PROJECT PARTNER

DVGW-Technologiezentrum Wasser

GO TO PROJECT

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Zukunft QMR

Completion 12/2023

PROJECT NAME

Future of microbial risk assessment

GOAL

Derivation of statements on the future development of assessment systems for microbiological parameters, development of stimuli for the further development of the DVGW Technical Rules.

BACKGROUND

For more than 100 years, the indicator principle has been used for the routine monitoring of drinking water hygiene. With this method, the potential presence of faecal pathogens in the drinking water is detected via indicator organisms. The method involves determining the microbiological drinking water quality through the comparison with specified limits.

However, in some respects, this concept reaches its limits and is therefore called into doubt. Although microbiological analytics has developed rapidly in recent years, the requirements according to the EU Drinking Water Directive have changed at the same time. This directive now makes it compulsory to implement a risk-based approach (quantitative microbial risk assessment, short: QMRA) in drinking water monitoring.

APPROACH

- Appraisal of the assessment approaches for the hygienic drinking water quality
- Enquiring about and compiling experiences gained with the two main assessment options faecal indicator principle and quantitative microbial risk assessment
- Identification of the advantages and disadvantages of the different approaches
- Presentation and discussion of the results in professional bodies of the DVGW and the UBA
- Evaluation of the results with regard to their possible applications
- Preparation of a guideline

PROJECT PARTNERS

DVGW-Technologiezentrum Wasser
IWW Rheinisch-Westfälisches Institut für Wasserforschung

GO TO PROJECT

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MoVe

Completion 12/2023

PROJECT NAME

Enhanced methods for the observation of microbiological parameters during drinking water monitoring

GOAL

Obtaining statements on the future development of the analytics of microbiological parameters, preparing recommended courses of action for water suppliers and recommendations for regulations and standardisation.

BACKGROUND

Recent years have seen a rapid development in the field of analytics of microbiological indicator parameters and pathogens. However, official drinking water monitoring is almost exclusively still based on the classical cultivation methods. Hence, the question arises what the future of drinking water monitoring for microbiological parameters looks like and whether there are any newer, more suitable methods that can be used for it.

APPROACH

- Appraisal of relevant analysis methods
- Description of the methodical principles
- Summary of all the potentials of biomolecular methods
- Evaluation of established methods from other fields in terms of their possible applications for drinking water suppliers
- Introduction and discussion of the (interim) results during stakeholder workshops
- Preparation of a draft for a “DVGW Water Information” on biomolecular detection methods

PROJECT PARTNERS

DVGW-Technologiezentrum Wasser
IWW Rheinisch-Westfälisches Institut für Wasserforschung

GO TO PROJECT

The DVGW

Innovations and rule making in the gas and water industry

As officially recognised regulatory institution, technical-scientific know-how carrier and promoter of technical innovations, the Deutsche Verein des Gas- und Wasserfaches e. V. (DVGW) is the competence network for all questions concerning the supply of gas and drinking water. The DVGW promotes and supports the gas and water industry in all technical-scientific matters. The DVGW concentrates its work efforts in particular on the topics safety, hygiene, protection of the environment and consumer protection. With the development of its Technical Rules, the DVGW facilitates the technical self-administration of the gas and water industry in Germany. Through this, the DVGW guarantees a safe gas and water supply in line with the highest international standards. As basis for technical innovations, research makes up an important subarea of the DVGW's activities. The DVGW promotes research projects of various institutes and also implements own projects.

The association was founded in 1859 and today counts approximately 14,000 members. As a non-profit association, the DVGW operates economically independent and politically neutral. At a local level, the DVGW operates via its local groups while at a national level, the regional groups constitute the first line of contact for members. Topics spanning nationwide or European dimensions are dealt with by the head office in Bonn, with offices held in Berlin and Brussels.

Research and development at the DVGW

The German energy and water industry is constantly facing new challenges. The climate change in particular requires the development of future-oriented concepts for the water supply that take into account both societal, eco-political and systemic, economic and safety goals. The DVGW research comprises projects in a regional and national context as well as research cooperations in a European context. It is at the same time basis for technical enhancements in the water industry, fosters rule making and standardisation and ensures the scientific quality of statements issued by the DVGW. The peripherally organised water research in the DVGW is spread among a total of eight facilities. These unite scientific expertise and university partnerships with the practical applications of the water industry. At the same time, the individual institutes complement each other in their expertise, thus forming a comprehensive network around the topic of water.

DVGW water research facilities

The water supply system


Household
16. Booster stations
15. Industry
Competition for land
intensive agricultural land use
14. Extraction and pumping station
11. Corrosion protection
13. Pipework
12. Water reservoir
Improper waste disposal
Competition for land
Renewable energies
10. Water consumption
8. Ground water
9. Construction project

Explanations regarding the water supply system

1. Surface water from **dam reservoirs** is used for drinking water abstraction if ground water is not available in adequate amounts.

2. **Spring water** is groundwater that does not need to be delivered with pumps but surfaces quite naturally.

3. Before the water pumped from wells, dam reservoirs or springs continues to flow towards the consumers, it must first be treated at the **waterworks** to achieve drinking water quality.

4. In Germany, approximately 6,000 enterprises and companies with approximately 38,000 employees are responsible for the public **water supply** and thus form an indispensable mainstay of society.

5. As foodstuff No. 1, drinking water in Germany must meet the highest quality requirements, which is intensively monitored and checked in **laboratories**.

6. To reduce hazards for the drinking water resources to a minimum, **water protection areas** are identified in the interest of providing vital public services.

7. Alongside larger rivers, the groundwater is recharged by naturally percolating fluvial water. The so-called **bank filtrate** can then be extracted by means of wells.

8. Roughly 61 percent of the drinking water in Germany are extracted via wells from **groundwater**, which is fed by percolating rainwater and is mostly very well protected due to the natural filtering effect of the soil.

9. Although the drinking water network rests well protected in the soil, it is repeatedly damaged due to **construction measures** during the construction of roads or buildings.

10. The daily **water consumption** in German households are around 121 litres per person, one third of which is used for drinking or food preparation. The remaining water is allotted to personal hygiene, flushing the toilet or using the washing machine.

11. The drinking water is transported over long distances to the consumers in water transport pipes. These pipes are often made from steel. To protect these pipes against damage caused by rust, special **corrosion protection measures** are taken.

12. **Water reservoirs** are used to compensate daily and seasonal fluctuations in water consumption in the piping system, so-called consumption peaks.

13. The drinking water network in Germany is roughly 530,000 kilometres long and would reach 13 times around the earth. Maintenance of the widespread **pipeline network** is indispensable to ensure unrestricted access to clean drinking water.

14. Adequate pressure is required for the drinking water to be able to flow over long distances through the pipe network to the consumers. If no natural gradients are available, so-called pumping systems are used, which boost the water pressure by means of **pumps**.

15. In many branches of **industry**, large amounts of water are required, as it is used in a variety of production steps, its uses ranging from cooling agent to product component.

16. In numerous regions, **booster stations** provide sufficient pressure in the pipeline network to compensate for natural differences in height.