

March 2023

Vision 2100

A Vision of a Water Conscious Society in the Year 2100



Foreword

The effects of climate change as well as shifts in social, political, and economic conditions will affect the availability of and demand for water in Germany. The accompanying necessary adaptation of all relevant infrastructure presents immense challenges for the water sector.

The early identification of these challenges is essential to ensure that structured intervention measures are identified for all relevant stakeholders in a timely manner.

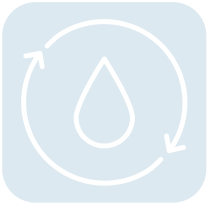
We, a group of experts from the water sector under the leadership of the DVGW and the DWA, have examined trends, challenges, and disruptions to the water cycle, while also leaving space for “unforeseeable events”, to derive a vision of a water conscious society in the year 2100.

This vision describes our ambitious aspiration for environmentally friendly, socially responsible, user focused action. The efforts of the water sector, in collaboration with all levels of government (municipal, state, and federal) and all other stakeholders in our society must align with this vision.

The vision expresses the belief of the water sector that the long term supply of clean high quality water in sufficient quantity is only possible in a natural environment that is protected and conserved. This in turn requires a water conscious society that places a very high value on water as the basis of human, animal, and plant life.



Water management in the year 2100 – Our guiding principles



Water is considered holistically within its natural water cycle, which also takes soil conservation into account. In all regions surface waters form a network that closely mimics natural processes through healthy, intact interactions with groundwater.

There is no substitute for clean water. It is vital for all living organisms and is the basis for sustainable economic activity within a liveable environment in a modern society. There is a consciousness about the natural water cycle, the circular economy for resources and the need for climate neutrality in all aspects of life and the economy. This has led to tangible action.



Water is not an object of commercial trade. It is an inheritable asset to be handed down in an intact natural condition from one generation to another. Water supply and wastewater treatment and disposal are provided as public services. In

the interest of the common good, public water supply takes precedence over all other natural water resource use.



Both sides of the water sector (water supply and wastewater treatment) have communally funded, future proof infrastructure and are robust and adaptable in the face of possible threats and crises. **The costs of drinking water supply and wastewater**

disposal are socially accepted and allocated using the polluter pays principle in a socially fair manner. Water usage fees fully cover all costs, including the ecological footprint, of providing water services.



On this basis, the water sector acts in a goal oriented manner to develop necessary solutions. All stakeholders are involved and a high level of societal acceptance is sought. Employees in the water sector therefore have fulfilling roles, as well as attractive

and secure jobs which serve both society and the environment. Under the aforementioned conditions, the challenges of climate change adaptation and demographic change have been overcome. **Land use is sustainable and water use conflicts have been resolved.** All branches of the economy are being transformed based on the sustainable use of resources, while being supported by digital tools.



Moreover, all people have safe, secure and continuous access to high quality water supply and wastewater treatment & disposal services. **Drinking water is hygienically safe and permanently available.** Wastewater borne diseases have been eradicated.

The environmental impact of wastewater management has been reduced, flood risks have been reduced and intervention in the natural water cycle has been minimised. Pollutants are retained and removed at their points of origin.



Knowledge and understanding about sustainable water management is continually being developed through research and innovation, which is made available to companies, government authorities, politicians, and society. **Research institutes**

and companies collaborate internationally to develop their knowledge base and find solutions for the future. Academia and industry are optimally interlinked in interdisciplinary research networks.

Our society embodies the precautionary principle

Our society is fully aware of the priceless value of water. This is reflected in **comprehensive resource protection**, **the prudent use of water** (e.g. through increased water reuse), the **minimisation of ecological footprints** and the **guaranteed long term funding of essential infrastructure**.

Based on an attitude that values water, the precautionary principle is lived out. Protection and careful use of water resources – without limiting or prohibiting the enjoyment and recreational value of water – have consequently become second nature to society.

The precautionary principle is purposefully and actively applied to all water use that competes with public water supply. Due to the limited contamination of groundwater with manmade substances, groundwater can be directly used as drinking water or can be prepared as drinking water using methods that closely mimic natural processes. The polluter pays principle is also purposefully applied in determining the liability for environmental and resource costs.

Our water resources are secure and are used sustainably

Natural water resources are adequately protected in terms of their natural attributes, e.g. through the designation of protection areas for all drinking water resources and ecological functions. All lakes and rivers in Germany have sufficient quality to allow recreational bathing. The extensive EU Water Framework Directive goals to achieve good quality in all water bodies, together with the requirements and goals to exclusively protect the water catchment areas of water extraction plants have long since been achieved and are being continually developed.

The water sector is able to respond to the effects of climate change, such as increased extremes in weather in the form of more intense drought and heavy rain events.

The use of natural water resources occurs sustainably. Water use by all user groups is transparent and occurs in harmony with the requirement to conserve the natural environment. The extraction of water from natural water resources has been significantly reduced through the use of advanced water saving technologies, extensive water reuse and responsible consumer behaviour. Agricultural irrigation uses water saving technologies, with the necessary infrastructure having been built according to demand.

Within industry, predominantly closed water and material cycles are used and any resulting wastewater is fully treated before discharge. Human settlements have been modified or built according to the principles of rain water management that mimics natural processes and the extensive closing of water and material cycles based on a trade-off between economic and ecological benefits.



Efficient, resilient and adaptable regions and systems



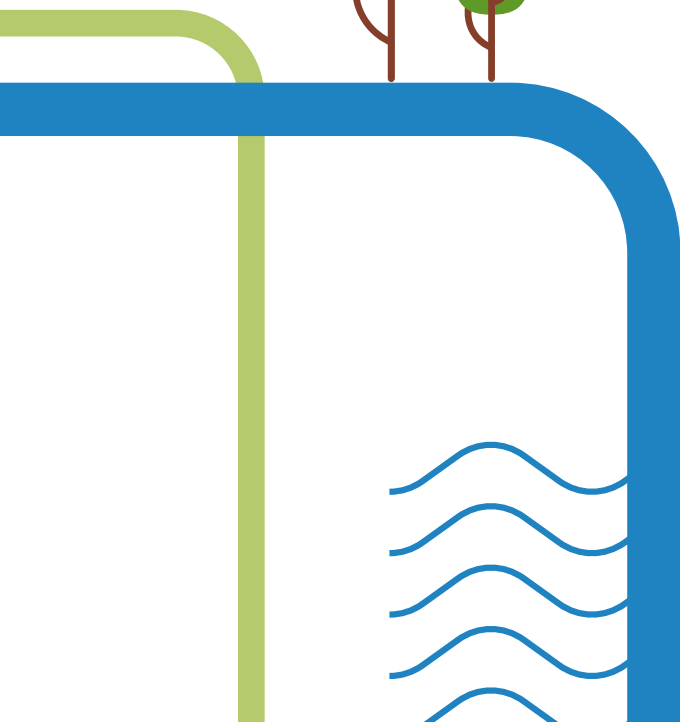
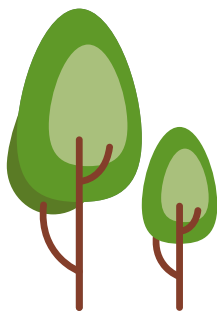
The water sector is energy efficient, fully exploits its potential for generating and supplying renewable energy to the power grid and is therefore largely independent of the interregional power supply. All plants and systems of the water sector are carbon neutral.

In all regions, operational and administrative structures based on the borders of river basins have been established – through cooperation and consolidation. Interregional dialogue occurs along with the common use of acquired data. Competent and capable operators, authorities and structures exist, which enable fair negotiating processes.

Populated areas which were previously heavily sealed with water impervious surfaces have been converted and developed into water sensitive cities. Nature based solutions and multifunctional land use for the retention, infiltration and evaporation of rainwater in urban areas significantly contribute to a pleasant urban climate. Rainwater is no longer automatically categorised as wastewater and enables water conscious & water sensitive rainwater management based on the quantity and quality of rainwater runoff.

Appropriate infrastructure, of a high technical quality, and other interventions ensure that our regions and settlements are resilient and adaptable. Drinking and wastewater systems are centrally, semi-centrally or decentrally structured depending on the conditions of the natural and built environment. The careful use of water resources and the extensive reduction of pollutants at their source allows many wastewater streams to be treated decentrally using simple processes. Heavily polluted wastewater streams are treated in sophisticated state-of-the-art plants. The innovation efforts of the entire economy are clearly focused on sustainability and low emission production processes.

Prolonged dry periods that at times extend over several years have changed rainwater management in that runoff is not drained out of settlements, but rather retained in the ground over a large area. In order to meet pronounced seasonal and regional fluctuations in water demand, peak demand and supply gaps, public water supply infrastructure and natural water resource management have been adapted. Likewise, numerous cooperations, interconnections between neighbouring utilities and connections to large water transport pipelines strengthen the security of water supply.



Publisher

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