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DWA-Position

The Revision of the European Urban Wastewater Directive

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The European Urban Wastewater Treatment Directive (91/271/EEC, "UWWTD") from 21 May 1991 has significantly improved the discharge and treatment of wastewater from households and from certain industries and has been contributing considerably to protecting water bodies in general as a result. The European Commission has announced its intention to revise the Directive that sets out minimum European legal requirements and with this intends to reorganise the European legislation on wastewater disposal on a long-term basis. This is also to improve the Zero Pollution Action Plan under the Green Deal.

According to the DWA, it is advisable to revise the content of the UWWTD so that European municipal wastewater disposal services can contribute significantly to keeping water bodies clean and achieving good water status in the future. The DWA strongly supports the achievement of the objective of good water status according to the Water Framework Directive.

The water sector is willing to contribute more in future but is incapable to achieve this goal alone with its existing means. Thus, on European level, a strong "polluter-pays principle" is required here. This applies to measures both to reduce the water pollution, as well as to finance these objectives.

The implementation of the Urban Wastewater Directive has progressed very unevenly in the Member States, especially regarding the implementation of UWWTD's Articles 4 (wastewater treatment) and 5 (advanced wastewater treatment). While simultaneously adding new requirements to the directive Europe-wide, the overall aim should thus be to implement the UWWTD well and homogeneously in all EU Member States. In addition, the scope of the directive should include smaller agglomerations in future and these must comply with European minimum standards for wastewater disposal.

The Nitrogen and Phosphorus Elimination should be considered a standard

The nutrient pollution of water bodies, including the seas, remains a European challenge. It is advisable to treat wastewater more extensively with eliminating nitrogen and phosphorus. Reducing nutrient inputs to water bodies is essential to achieving good ecological water status under the Water Framework Directive. Thus, targeted nitrogen and phosphorus elimination should be a standard requirement for larger wastewater treatment plants throughout Europe. This process would also simultaneously retain more relevant micropollutants in the wastewater treatment plants as scientific studies have shown.

It is hardly practice to implement the designation of less sensitive areas. Hence, it would make sense to delete the ability to designate less sensitive areas 27 years after the directive coming into force. If sensitive areas were to be designated according to the directive in the future, this should mean even stricter requirements. However, this presupposes that the Member States must agree upon a coherent definition, which is aligned with a clear European framework.

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Sensible Adaptation of Nutrient Specifications to the State of the Art

The Urban Wastewater Directive should continue to set minimum standards for nutrient pollution to protect water bodies. In doing so, the different levels of wastewater treatment in the Member States must be reconciled with a sustainable adaptation. When setting minimum standards, it must be taken into account that more stringent requirements for phosphorus elimination result in the use of additional chemicals, which impact water bodies. Thus, additional costs and electricity consumption incur significantly if additional filtration processes are required. Similarly, this applies to extensive requirements for nitrogen elimination. As a result, the DWA advocates a sensible adaptation of the European minimum requirements for nutrients in favour of the water body status. In the DWA's view, the concentration values of the UWWTD, as specified in Table 1 are set very moderately. While the concentration values for phosphorus and nitrogen, as shown in Table 2, suffice largely as European minimum requirements for discharges into sensitive areas where eutrophication occurs. Measures for further nutrient reduction at wastewater treatment plants are required on the immissions´ side in order to meet the required objectives set by the Water Framework Directive, where necessary. The DWA believes it is also correct to follow this water body-related approach. In addition, a large proportion of the water pollution in this context derives from diffuse sources (especially from industrial agriculture), which cannot be reduced by stricter discharge requirements at municipal plants. Therefore, the proposed concentration values in Table 1 are to be updated as follows: COD from 125 to 70 mg/l O_2, suspended solids from 35 to 20 mg/l between 2000 and 10 000 p.e. These concentration values may be reached with simpler treatment stages as well and are thus justifiable as minimum requirements under European law with appropriate transitional arrangements. Stricter national requirements are possible where there is a need at water side and measures at source have been exhausted or are not possible.


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According to the UWWTD, in general "end-of-pipe" approaches regularly represent only second-best solutions compared to measures at the source, and primarily, "polluter-pays principle" should guide the next steps to protect water bodies under European law.

Focusing on the Stormwater

Rainwater can be a significant source of water pollution and hence, should be limited. At the same time, if possible, it is not advisable to mix unpolluted rainwater with wastewater during discharge. The UWWTD regulates requirements for urban wastewater, but essentially only addresses the area of stormwater in a footnote in Annex 1. In future, it is logical to direct the focus of the directive more strongly towards this area. In particular, it is very important to differ between the statements on storm water and combined sewer flow with the associated drainage methods "separate sewer systems" and "combined sewer systems". The term "storm water overflow" used in the footnote above is too vague. Therefore, it is sensible to differentiate between "orderly combined sewer overflows" from the combined sewer system, storm water from the storm sewer system, or impermissible overflows from domestic and industrial wastewater sewer system.

It is necessary to regulate the principles of rainwater management and rainwater management equally throughout Europe. A general specification of a particular drainage system (combined or separate system) should not be required. Specifications entail a site-specific assessment, whereby the assessment at existing sewerage facilities must include the material load of the stormwater, as well as the special pollution situations of the waterbody. Separate sewer systems should be the norm for new sewer systems or sub-systems. This way low-loaded storm water is not to be discharged via the sewer system.

The UWWTD should provide a pollution-related target for source-based stormwater management that evaluates the impact of stormwater and combined sewer discharges in the context of achieving good water status.

In the case of combined sewer overflows, the DWA believes that this is executed by means of water balances, which can be used to make a well-founded estimate of the pollutant loads leaving a settlement area. In this context, the proportion of wastewater in the combined sewer overflow can be used as an emission target value, which can be determined with appropri-

ate accuracy, e.g. by means of a discharge- and volume-based long-term simulation through model calibration. The referral to the proportion of wastewater, which is discharged past the treatment plant through combined sewer overflows, precisely takes into account the water pollution by wastewater-borne trace substances, in particular wastewater-borne micropollutants which are assessed as relevant.

In line with an adapted directive Member States should provide incentives for measures of storm water management. These could comprise of decentralised rainwater retention, infiltration, evaporation, rainwater harvesting, delayed (open) discharge to reduce/limit the inflow of rainwater into the sewer system, including polluting loads, and case-specific treatment of polluted rainwater runoff in the separate sewer system. In this context, Member States could be obliged to provide for appropriate management plans, following the example of the EU Floods Directive. In this context, synergies can be achieved for a water-sensitive design of urban areas as well and thus, for improved adaptation to the effects of climate change (for example in connection with flash floods), as well as for making important contributions to reducing the input of microplastics, e.g. as a result of tyre abrasion. For the assessment of the material load of precipitation water, the transported solids could be suitable as a uniform reference parameter. This would actively implicate the next pollution topic; microplastics.

Ensuring Better Protection of Water Bodies from Microplastic Inputs

Increased pollution of the environment by plastics is a problem that needs solving. As a result, the DWA welcomes the intensive source-related measures at European level as part of implementing the plastics strategy, because they are aimed at prevention. With regard to the increasingly perceived problem of microplastics pollution (i.e. with particles < 5 mm grain size), it is important to close considerable knowledge gaps. For this purpose, it is imperative to develop harmonized and standardized measurement and analysis methods as well as a uniform terminology. It benefits all parties to align on an international agreement. Microplastics enter the aquatic environment via the wastewater pathway via the spreading of sewage sludge, combined sewer overflows or stormwater.

Wastewater treatment plants regularly remove between 95 and over 99 percent of the influent microplastic load. The plastic content in the wastewater stream largely passes into the sewage sludge during treatment. For the area of agricultural sewage sludge utilisation, which is in strong decline in Germany due to the implementation of the new Sewage Sludge Ordinance, suitable quality assurance measures must be taken to ensure extensive protection against the input of plastics into the environment. The requirements of the national Fertilizer Ordinance already stipulate to reduce extraneous plastic components significantly or degradable within certain time periods. Alternatively, sewage sludge should be recycled for energy purposes as plastic particles can generally be disposed of safely in the incineration process. According to the DWA, regulations on microplastics in the Urban Wastewater Directive are not

appliable yet. Synergies could be exploited by means of obligatory rainwater management for important contributions to reducing inputs from tyre abrasion. Finally, it is advisable to replace plastics by environmentally compatible materials or processes, or producing plastics, which are recyclable and reused in an equivalent manner. Environmental-friendly product design is also necessary especially in the composition of tyres, as tyre abrasion represents a high freight component in connection with plastic inputs into the environment. It would be wise to examine whether and to what extent instruments of extended product responsibility may be effective here.

Reducing Inputs of Micropollutants

Inputs deriving from the manufacturing and using of pharmaceutical, industrial and cosmetic products are entering into water bodies. Due to the issue of improved water protection, the DWA calls for an active policy to avoid or reduce the harmful substance inputs. In recent years, within the federal government's dialogue on micropollutants results are materialising, that represent a heterogeneous group of stakeholders which can now serve as a model for European action. When assessing the risk, it is important to reduce the input of persistent, mobile and toxic substances into the water cycle significantly in source-related, application-related and downstream terms. New Specifications should take into account the situation in the water body but also the additional environmental burdens (energy, resources) caused by further purification stages. A proper strategy for reducing water pollution by micropullutants is based on various pillars and involves all contributors to water pollution. Producers, processors and distributors of products which, when used as intended, may pose risks to water bodies. They need to be considered as "polluters" in this sense as well. Hence, the first step must be to tackle the sources of the input pathways. On European level, there is a need to strengthen the "polluter-pays principle" when identifying the most suitable measures and finding the financial resources to fight them. DWA calls for developing and implementing an extended producer responsibility for the water sector in Europe, in which regulatory measures and financing instruments are examined. A second pillar is the retrofitting of more advanced treatment stages at municipal wastewater treatment plants wherever there is a need for action in relation to water bodies and water use from a precautionary point of view. In view of the considerable complexity of such advanced wastewater treatment processes, these methods should initially be limited to wastewater treatment plants beyond a capacity of 50,000 p.e. within the framework of the European minimum requirements.

Where water pollution derives predominantly from diffuse sources,(introduced via atmospheric pathways, erosion or soil passage) other effective measures are required.

If the expansion of facilities with more advanced purification processes or other measures to reduce the problem of micropollutants should be stipulated at European level, a coherent financial concept must also be presented which includes the polluters of trace substance discharges.


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Bringing Waste Water Plants in Line with European Standards throughout Europe

The Urban Wastewater Treatment Directive contains hardly any regulations on the proper operation or maintenance of wastewater facilities. Existing requirements, such as the prevention of leakage in relation to sewer systems, are very vague. It makes sense to include minimum standards, e.g., by reference to the management systems or the European standards. Up until the adoption of the UWWTD, European standards have emerged which may be referenced to reflect a contemporary minimum standard. In the field of drainage systems, the standard is DIN EN 752 "Drainage systems outside buildings - Sewer system management".

Considering the possibility foreseen by the Directive of providing for so-called individual systems to ensure a comparable level of environmental protection, the establishing of the DIN EN 12566 series of standards for small wastewater treatment plants should be considered as a reference.

Strengthening the Energy Efficiency of Waste Water Treatment Plants

Wastewater treatment plants are among the major municipal electricity consumers. Due to this, it is justifiable to specify in a more advanced version of the UWWTD to use technologies which are energy-efficient with comparable treatment performance and operating expenditure. The DWA opposes immensely to introducing energy efficiency classes for wastewater treatment plants, as the framework conditions for the plants are too different and thus not comparable. The worksheet DWA-A 216 "Energy check and energy analysis - instruments for energy optimisation of wastewater treatment plants" provides technical specifications which improves the energy efficiency of wastewater treatment plants considerably.

Reducing Airborne Greenhouse Gas Emissions

Depending on the plant configuration and wastewater composition, the wastewater treatment process may cause relevant greenhouse gas emissions, which escape into the air and thus should be reduced as much as possible. We know already of various emission pathways (such as methane slip from anaerobically treated sewage sludge and sewage gas combustion). For other pathways a monitoring and the development of options for action are required (e.g., nitrous oxide emissions from the wastewater treatment process). It is possible to reduce CO_2 emissions based on energy consumption in the short term through energy efficiency measures (see above). In the medium term the progressive use of renewable energies reduce these emissions. The framework conditions contributing significantly to greenhouse gas savings include the continuation of the cap on the national Renewable Energies Law (EEG) levy and the exemption of self-supply from the EEG levy, as well as the simplification of reporting procedures in the area of self-supply.

The conversion of organic wastewater constituents to CO_2 via the biological conversion and the sewage sludge incineration is to be considered climate neutral.

Targeted Use of Resources From Wastewater and Sewage Sludge

Wastewater contains important resources which should be used, if possible (e.g. through anaerobic treatment of sewage sludge), reused or recovered as raw materials. Wastewater treatment plants are able to contribute significantly when closing material (e.g. P and N) and water cycles, as is valid for the area of energy. Here, the task of wastewater treatment by means of water protection at justifiable fees remains the priority.

Extending Targeted Monitoring

Monitoring and reporting generates bureaucracy, meaning that regulations on this must proceed with sound judgement. Simultaneously, it is essential to implement proper uniform monitoring in the environmental sector, for example, in order to determine how suitable and progressive the process is to achieve the objectives or how to prepare any further measures. DWA advocates a monitoring that is developed properly in line with the UWWTD. This means to record combined sewer overflows, ideally by number and time slot in the future. This would allow to draw conclusions on the relevance for the respective water bodies. Within the framework of the UWWTD, an extension of systematic "monitoring" to new substances in wastewater treatment plant effluents, stormwater and combined sewer overflows should not take place. However, the Member States should determine this according to their relevance or on a river basin-specific basis.

Wastewater Disposal Assists with Pandemic Surveillance

Sanitation derives from health protection and preventing diseases (public service provision). Due to this, social health, and an increase in people's life expectancy through necessary hygiene measures have improved considerably as a result of these contributions. However, in view of the current pandemic, scientifically, one can rule out the spread of current infectious COVID-19 viruses via the wastewater pathway. Hence, from an infection risk perspective, municipal wastewater can not be considered relevant and an active involvement of municipal wastewater disposal to contain the pandemic is not indicated. This is due to both the lack of formally considering this as a "task" and to the lack of financial means of these measures.

Nevertheless, wastewater disposal may provide useful support to the health authorities in combating the pandemic. This means that the analysis of wastewater and the containing viral artefacts may be used to trace back regional entry hot spots at a much earlier stage than is possible in a rather conventional way using incidence figures. One can detect known mutations at an early stage and thus, raising the potential for reducing the number of unreported cases. Thus, it may be used as an "early warning" system.

Current research shows that it is possible to monitor COVID-19 traces via the wastewater pathway. This can provide early and reliable regional information on the infection situation. The analytical methods used are mostly established in microbiological analysis. The difficulties associated with sampling or sample preparation have been resolved to a large extent. It is now up to the health policy to examine quickly how such data can be used to combat the pandemic. The water industry considers examining the wastewater for genetic information on the COVID-19 virus to be useful in practice and hence, is offering assistance. DWA themselves, are involved here, among other things, by offering a networking spot for researchers in the so-called CoroMoni project.

The precautionary health protection has the task to schedule the collection and evaluate the health-related parameters for the assessment of infectious events. This also applies for examining the wastewater pathway for the degree of exposure to residues of the COVID-19 virus. However, it makes very much sense in practice to give this task to the wastewater utilities with more closeness to the subject as a support service. The cost of sampling and testing is approximately between €400 - €800 per sample and may not currently be funded through wastewater charges.

Should the legal framework in future prescribe the wastewater disposal authorities or the operators of the wastewater plants to carry out the corresponding sampling or even executing the testing, it is absolutely necessary to define this task very clearly from the task of the wastewater disposal (discharge and purification), and the financing should be separated as well.

It is important to emphasise that only supporting services of preventive health protection can be provided for here, which, in addition, must accordingly be financed from external resources.

Promoting and Gradual Harmonising Qualifications of Treatment Plant Personnel

The Article 10 of the UWWTD requires only indirectly and to some extent that plant personnel in Member States are to operate and maintain wastewater treatment plants properly. In the view of the DWA, for proper wastewater treatment, well-trained personnel are just as important as the equipment of the technical plants. If the Urban Waste Water Directive sets minimum requirements for orderly wastewater discharge and treatment, a first step towards a uniform European qualification of plant personnel should be considered according to the framework of further development and in compliance with the subsidiarity principle. This especially applies to the leading technical managers. The European Qualifications Framework could be a good foundation to start from as this has been implemented in Germany based on the German Qualifications Framework (DQR).

How to Download the Position Paper:
https://de.dwa.de/de/politikinformationen.html

In addition, we would like to draw your attention to the following DWA position papers, among others, which can also be obtained from the above-mentioned address:

- Water-conscious development of our cities, April 2021
- Floods and flash floods, May 2018
- Water Framework Directive Review 2019, November 2017

Facts and figures:

Sewage disposal in Germany

Number of municipal wastewater treatment plants[1]:	9,105
Size[1]:	152 million population equivalents (E)
Stormwater overflows and overflow basins, storage sewers approx.[2]:	45,000
Stormwater Sedimentation Tank approx.[3]:	4000
Wastewater in public wastewater treatment plants (average)[1]:	117 litres per population equivalent per day
Cost of wastewater disposal (average)[4]:	39 cents per citizen per day

Sewage disposal

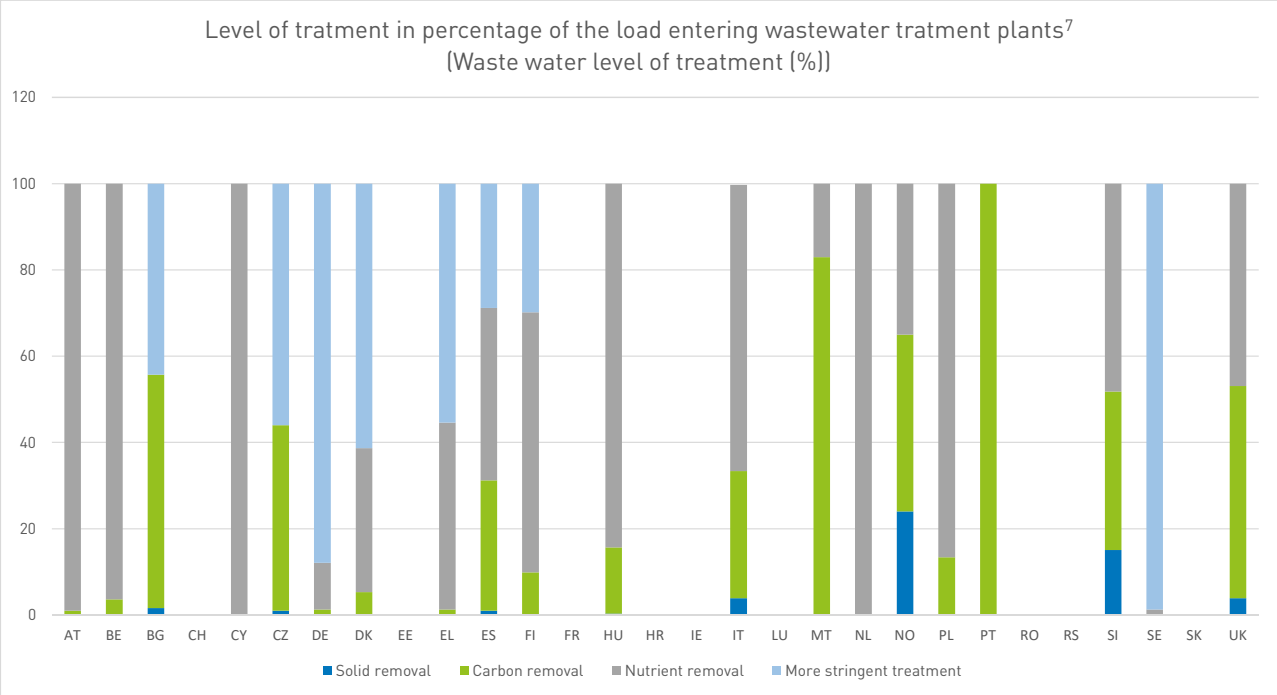
Essential waste water parameter	Mean elimination rate[5]
Chemical oxygen demand	95 %
Nitrogen	83 %
Phosphorus	93 %

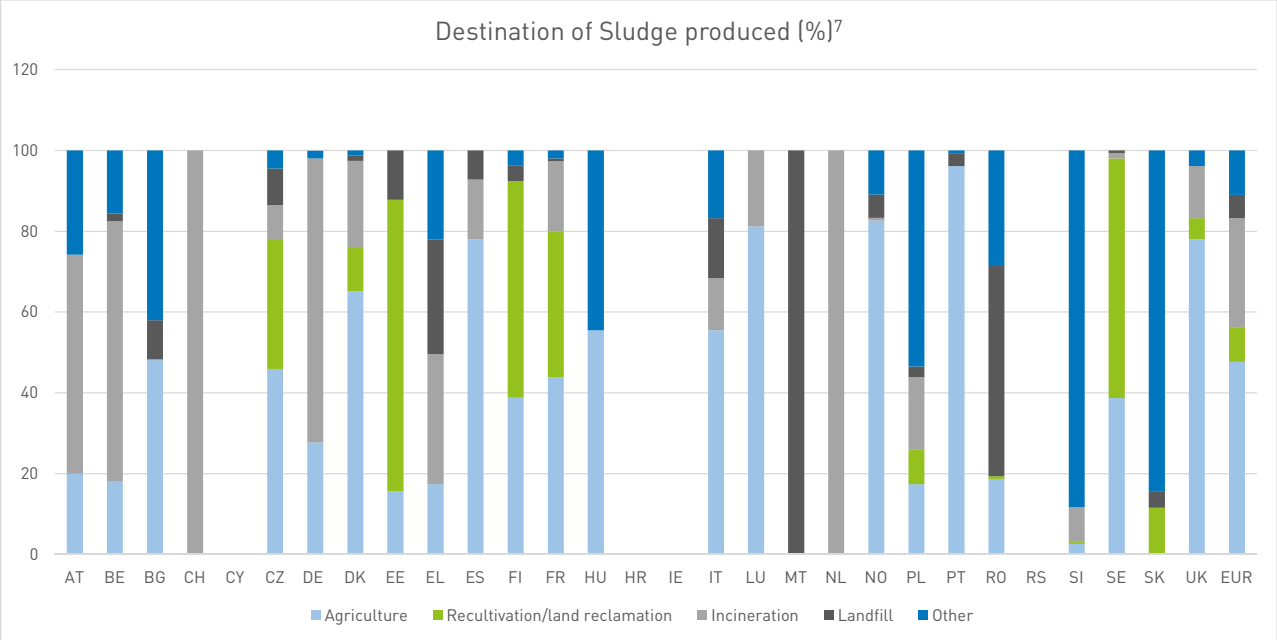
Number of wastewater treatment plants by size class (according to AbwV)[1]

Size class (population equivalents)	Number of installations (approx.)
GK 5 (greater than 100,000 E)	235
GK 4b (up to 100,000 E)	307
GK 4a (up to 50,000 E)	1.602
GK 3 (up to 10,000 E)	867
GK 2 (up to 5,000 E)	2.300
GK 1 (up to 1,000 E)	3.794

Length of public sewerage system[1]:	594.335 km
Sewerage connection rate[1]:	97 %
Average age of sewer network[6]:	approx. 37 years
Annual waste water volume[1]:	approx. 10 billion m^3 per year
Length of private sewage pipes[1]:	estimated at over 1 million km
Electricity generation from municipal sewage gas or digester gas[1]:	approx. 1.5 TWh

Currently, approx. 1.7 million Mg dry matter (DM) of municipal sewage sludge are produced in Germany per year. Of this, 74 % (1.3 million Mg DM) was thermally treated[1]. The amount of 440,000 Mg DM/a still recycled in 2019 is expected to decrease to 200,000 Mg DM/a. For the remaining approx. 1.5 million Mg DM/a, 20 mono-incineration plants for municipal sewage sludge with a capacity of approx. 500,000 Mg DM/a are available.





Quellen:

1 DESTATIS

2 Dettmar, Brombach: In the mirror of statistics: wastewater sewerage and stormwater treatment in Germany, KA 2019, 66, 354-364.

3 Dettmar, Brombach, loc. cit.

4 DWA Economic Data Survey 2014

5 32nd DWA performance record of municipal wastewater treatment plants 2019

6 DWA survey State of the Sewerage System in Germany 2020

7 EurEau Europe's Water in Figures 2021

Clear Concepts. Clean Environment.

The German Association for Water, Wastewater and Waste (DWA) is strongly committed to the development of secure and sustainable water and waste management. As a politically and economically independent organisation it is professionally active in the field of water management, wastewater, waste and soil protection.

In Europe DWA is the association with the largest number of members within this field. Therefore it takes on a unique position in connection with professional competence regarding standardisation, professional training and information. The approximately 14 000 members represent specialists and executives from municipalities, universities, engineering offices, authorities and companies.

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