

DANUBE WATCH

THE MAGAZINE OF THE DANUBE RIVER • WWW.ICPDR.ORG

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ICPDR IKSD

International Commission
for the Protection
of the Danube River

Internationale Kommission
zum Schutz der Donau

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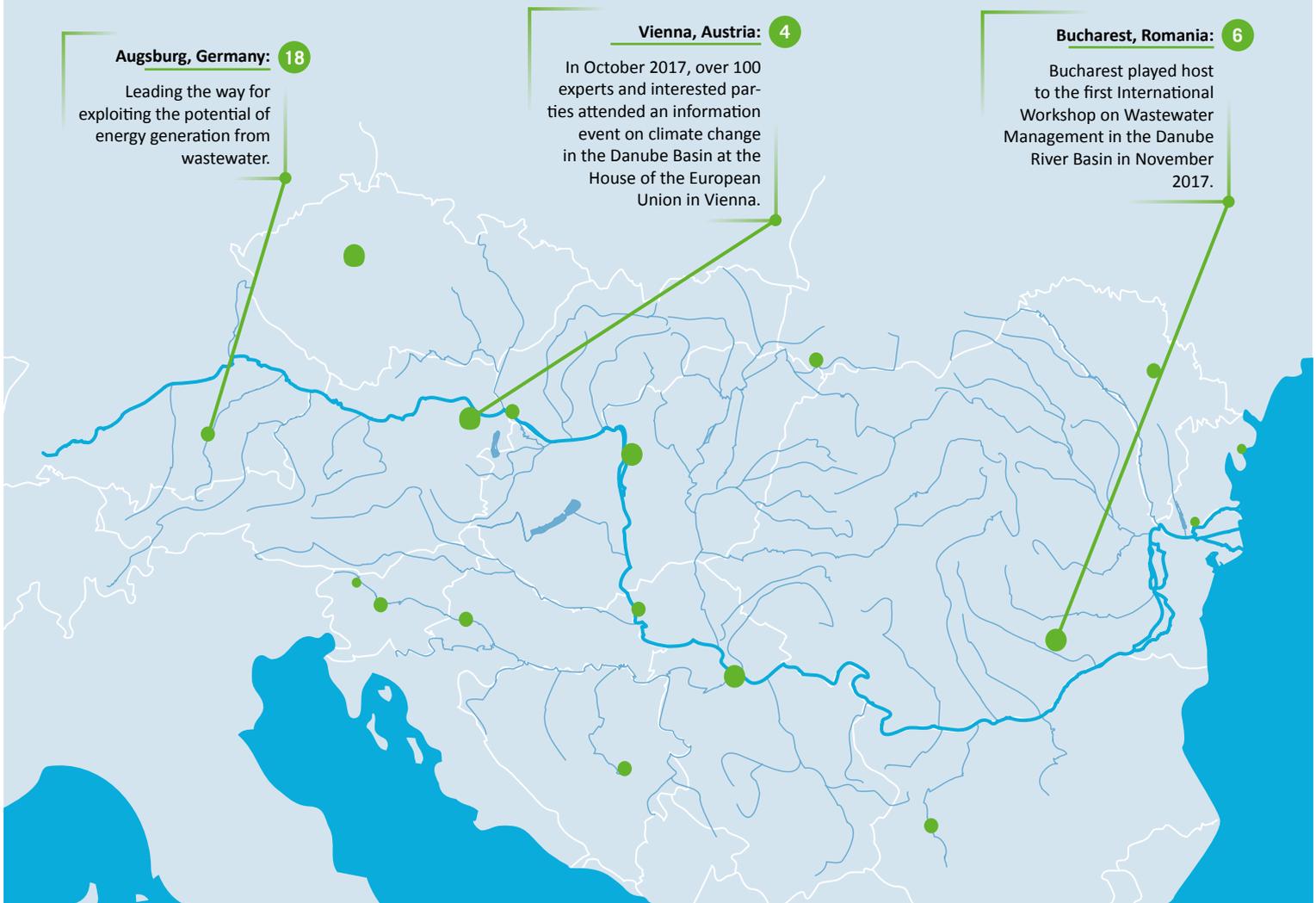
Leading the way for exploiting the potential of energy generation from wastewater.

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In October 2017, over 100 experts and interested parties attended an information event on climate change in the Danube Basin at the House of the European Union in Vienna.

Bucharest, Romania: 6

Bucharest played host to the first International Workshop on Wastewater Management in the Danube River Basin in November 2017.





Dear readers,

The discharge of untreated or badly treated wastewater into rivers, streams and groundwater used to be a serious problem in the Danube River Basin. Today, due to a huge effort and significant investment by all ICPDR Contracting Parties, the situation has improved greatly. When comparing the latest emission figures (2011/2012) for the urban wastewater sector to those of the 1st Danube River Basin Management Plan (DRBMP) (2005/2006), it is clear that a remarkable reduction of both organic and nutrient pollution has been achieved.

Wastewater management is a key priority for the ICPDR, and the 2015 update of the DRBMP's vision and management objectives for 2021 calls for yet a further reduction of organic pollution of surface waters via urban wastewater within the basin. This involves the implementation of the Urban Waste Water Treatment Directive EU (UWWTD EU), along with the construction of a specified number of wastewater collecting systems and municipal wastewater treatment plants for non-EU Member States.

It is hoped that by 2021 the Danube countries will bear witness to the establishment of public sewer systems for all agglomerations with population equivalents (PEs) of more than 2,000 and their connection to urban wastewater treatment plants. But despite the substantial progress already made, there is still a great deal of work to be done, mainly in countries with limited access to EU funds.

The ICPDR is helping its Contracting Parties to develop scenarios for the advancement of the reduction of organic and nutrient pollution to fulfil the requirements of the EU UWWT Directive.

In order to address this issue, we organised a workshop on wastewater management in November 2017, together with the World Bank, the Joint Research Centre of the European Commission (JRC) and the International Association of Water Supply Companies in the Danube River Catchment Area (IAWD). This workshop focussed on the three pillars of wastewater management: Investment & Financing, Management & Operation, and Innovation & Technology.

The ICPDR will continue to work with partners to assist the Danube countries to expand their capacity in policy areas of wastewater management and to develop smart projects to deal with municipal pollution. We will also continue to work with the EU and international financial institutions to fill gaps in the finance of these important measures.

We are also committed to continuing to serve as a knowledge hub and platform for improving the design and operation of sewage systems and wastewater treatment plants; and to facilitate the use of innovative solutions to management and technical challenges, including sludge management, energy optimisation and wastewater reuse.

I hope that this issue of Danube Watch will help the ICPDR to stay focused on this very important aspect of water resource management in order to achieve cleaner, safer and healthier waters for everyone in the Danube River Basin to enjoy.

Ivan Zavadsky is the Executive Secretary of the International Commission for the Protection of the Danube River

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International Commission for the Protection of the Danube River
Internationale Kommission zum Schutz der Donau

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Danube Watch is the official magazine of ICPDR, the International Commission for the Protection of the Danube River. Danube Watch enhances regional co-operation and information sharing on sustainable water management and environmental protection in the Danube River Basin. It reports on current issues affecting the Danube Basin, and on action taken to deal with challenges in the river basin. Striving for scientific accuracy while remaining concise, clear and readable, it is produced for the wide range of people who are actively involved in the Danube River Basin and are working to improve its environment.

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News & Events

The Danube meets other major world players at the Water and Climate Summit

On 23-25 October 2017, the Meeting of the Great Rivers of the World Summit took place in the Campidoglio in Rome, Italy.

Managers and representatives from major river basins from around the world met to discuss the increasing threat to the future of water represented by climate change and its dramatic consequences. The key objective of the summit was to draw international attention to the need to accelerate action on water and climate adaptation.

During the course of the event, the 2017 ICPDR President Peter Gammeltoft made a statement on behalf of the ICPDR outlining the ICPDR Climate Adaptation Strategy and explained how climate change adaptation has been integrated into the Danube River Basin's flood risk management plans. Emphasising the need for the establishment of international river basin organisations, Mr Gammeltoft concluded his speech by stressing the need to accelerate investment in water infrastructure and better integration of water policy objectives into other policies such as agriculture, energy and transport if UN Sustainable Development Goals (SDGs) are to be achieved.



For more information, visit:

<http://icpdr.org/main/danube-meets-other-great-rivers-world-water-and-climate-summit>



Vienna Climate Change Information Event



For more information, visit:

<http://icpdr.org/main/climate-change-danube-region>

On Monday 9 October 2017, over 100 experts and interested parties attended an information event on "Climate Change in the Danube Basin" at the House of the European Union in Vienna.

The event was held to celebrate the European Union's 2017 presidency of the ICPDR. Following a short presentation by the ICPDR President Peter Gammeltoft, representatives from the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW), presented the winning projects for the Danube Art Master 2017 environmental art competition along with artistic water videos, developed in collaboration with the Vienna University of Applied Arts.

Professor Wolfram Mauser, Department Chair for Physical Geography and Remote Sensing at the Ludwig Maximilian University (LMU) Munich continued the proceedings with a talk on climate change in the Danube basin. The talk was an excellent transition to the final panel discussion, reflecting the problems of adaptation strategies in the Danube river basin.

The conference focused on the core issues of climate change and its impact on the Danube. Such adverse effects can only be managed with cross-border cooperation and jointly coordinated measures. Over the years, the ICPDR has established an exemplary platform for tackling these challenges.

The ICPDR and the Danube guests of the EU Parliament



On 8 November, Adina Vălean, Chairwoman of the ENVI Committee at the European Parliament hosted a relaxed social gathering and exhibition with the Motto "Our Danube" on the occasion of the 2017 EU Presidency of the ICPDR.

The social event took place at the Press Bar of the European Parliament in Brussels where guests were invited to celebrate the achievements of the ICPDR. Following the opening speech by Chairwoman Vălean, Joanna Drake (Deputy Director General of DG Environment), Jean-Pierre Halkin (DG REGIO Head of Unit for Macro-regional Strategies) and Ambassador Luminița Odobescu (Permanent Representative of Romania to the EU) took the floor to praise the work of the ICPDR in the Danube River Basin and Europe in general. They also thanked the organisation for its work in improving the quality and safety of waters in the basin. In his address, ICPDR 2017 President Peter Gammeltoft reviewed his Presidency of the ICPDR and invited all attendees to visit the exhibition created for the event, highlighting the different aspects of the work of the ICPDR since its establishment.



For more information, visit:
<http://icpdr.org/main/icpdr-and-danube-guests-eu-parliament>

EDO Expert & User Meeting at the JRC in Ispra

The European Drought Observatory (EDO) is a service run by the European Commission's science and knowledge service in conjunction with the Joint Research Centre (JRC). It supports EU policies with independent scientific evidence and drought relevant information. Between 9 and 10 November 2017 the EDO Expert & User Meeting took place at its research campus in Ispra, Italy.

The objective of the meeting was to present EDO's history, status and ongoing activities, to demonstrate the functions of the EDO, collect feedback on system components and to discuss possible improvements and future developments. The best way to foster and maintain possible future collaborations and the development of a network of partners and users was also broadly discussed. Different networks already exist at different levels and the question was raised as to how best connect them. It was widely agreed that in order to extend and sustain drought activities between this network of partners, commitment was required from all involved parties.

Following the 2015 drought events in the Danube River Basin, the ICPDR was tasked with drafting a report on the impacts of droughts in the Danube Basin, the measures taken and lessons learned. "The 2015 Droughts in the Danube River Basin Report" includes an overview on the main characteristics of the meteorological and hydrological situation during 2015, summarises the main impacts on water-related sectors and includes an overview of measures taken by the individual Danube countries.



For more information, visit:
<https://www.icpdr.org/main/icpdr-releases-report-2015-droughts-danube-river-basin>



International Workshop on Wastewater Management in the Danube River Basin

Bucharest played host to the first International ICPDR Workshop on Wastewater Management in the Danube River Basin on 28-29 November 2017. The workshop was co-organised by the ICPDR, the International Association of Water Supply Companies in the Danube River Catchment Area (IAWD), the World Bank, and the Joint Research Center of the European Commission. The event was hosted by the National Administration "Romanian Waters" and the Romanian Ministry of Waters and Forests.



The initiative was a response from the ICPDR to requests from the countries in the Danube River Basin, which had expressed a need to deal more specifically with the multi-dimensional problem of wastewater management under the ICPDR's umbrella.

The countries had already identified the challenges they were facing before the workshop and outlined potential issues that needed addressing. The workshop was then organised to bring together the relevant administration (national and local authorities) and utility sectors together with all relevant stakeholders for joint discussions on the following three pillars:

- Investment & Financing
- Management & Operation
- Innovation & Technology

The objective of the workshop was to establish a clear concept of roles and responsibilities for all stakeholders involved, and to identify all necessary further steps to be tak-

en to enhance the sustainable management of wastewater infrastructure and services. Moreover, the workshop provided the participants with a platform to identify, share and discuss best practices and cost-efficient solutions for wastewater management.

Investment and Financing

Understanding the financial issues behind the construction, upgrading and extension of wastewater collecting systems and treatment plants is crucial for the improvement, maintenance and efficient operation of wastewater infrastructure and facilities. Funding sources, ways of adsorbing funds, investment prioritisation according to cost-efficiency and cost-benefit analysis were all critical issues discussed during plenary sessions.

Emphasis was placed on the need for tariffs that are both sufficient, appropriate and also affordable. Proper incentives and accountability measures need to be in place if newly established infrastructures are to

operate in a sustainable manner, which is in compliance with wastewater collection, treatment and discharge standards.

Management & Operation

There is substantial demand – at national, regional and local levels – for qualified experts in the field of wastewater management-related project development and implementation. In order to better absorb available funds, people with appropriate organisational and strategic skills at all levels are essential. Moreover, regulation and control of implementation issues at water authority level are of the utmost importance.

Utilities often lack sufficiently trained technical experts. Well-developed training and capacity-building programmes targeting the operation and maintenance of wastewater infrastructure are therefore necessary to ensure not only a qualified workforce, but also efficient and sustainable wastewater treatment.



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Innovation & Technology

Technological progress coupled with a growth in environmental awareness in dealing with water resources has led to a number of technological breakthroughs. Options are constantly expanding, ranging from sludge and wastewater reuse, biogas utilisation, energy optimisation to treatment of organic micro-pollutants, all of which allow for the utilisation of resources by adopting a technology-driven and environmentally aware approach.

The establishment of individual or small-scale, decentralised treatment systems is recommended in small agglomerations with a population equivalent of below 2,000, and in areas where construction of sewer systems is not feasible. Wastewater management can be sensibly managed by means of decentralised treatment facilities to ensure technically and economically viable infrastructure.

Take-home messages

The workshop was successful in raising awareness with regard to a number of issues, the most important being:

- 18% of people in the Danube region do not have access to sanitation due to issues of underdeveloped/missing infrastructure or affordability. UW-WTD guidelines dictate that investments should be made to establish proper wastewater infrastructure and the costs should be recoverable. However, countries should have the opportunity to deviate from this principle if it is deemed necessary, thereby making tailor-made solutions for individual Wastewater Treatment Plants (WWTPs) possible.
- The Danube region is changing rapidly, technology is constantly evolving and the trend is moving towards innovation. The question is what type of innovative wastewater technology should be

adopted and developed to make wastewater viable as a resource.

- Sustainability is key in terms of wastewater management and a clear strategy is needed, along with a regional approach. There is an urgent need to develop capacities and speed up the process of joining the EU in the non-EU Member States.
- Construction of WWTPs needs better preparation in terms of data collection, and a sound basis for decision-making during the planning phases. A regional approach is also needed in terms of establishing enabling proper regulatory frameworks, public participation (tariffs, consumer awareness), etc.
- With the right incentives, proper capacities at a local level and more autonomy for utilities to make their own decisions, progress can be made and a smarter approach towards wastewater management achieved.

Identifying alternative financing for the water sector

We are surrounded by the benefits of past investments, and the human cost of poor water quality is clear, from reduced economic productivity to childhood stunting due to endemic diseases. Yet mobilising the financing needed to secure water supply and build resilience to climate change is not as easy as it sounds.

Countries bordering the Danube River have benefited substantially from investments from the European Union since initiating the accession process, most of which have been in the form of grants. In these countries, public funding from taxes and external transfers can represent a sizeable share of total sector investment, up to 60% in countries such as Montenegro, Albania or Kosovo. EU funding rose steadily between 2000 and 2015, and accounts for about 60% of total international transfers to the region, yet much remains to be done to meet EU Directives, particularly in the area of wastewater collection and treatment. It will therefore be a major challenge to provide finance in a tough environment where major funding is needed to tackle the refugee crisis and adaptation to climate change.

The World Bank is looking into what it will take to achieve the Sustainable Development Goals (SDGs) for the water sector and beyond. At a global level, for drinking water and sanitation services alone, we have estimated that at least US \$114 billion will be needed annually to meet universal access to safely managed water and sanitation in 140 low and middle-income countries, 60% of which will be needed for sanitation. Investment requirements vary substantially from region to region: for the Danube countries alone, the 2015 State of Sector report released by the Danube Water Program estimates that “total water and wastewater investments in the region are around €3.5 billion a year. This is significantly lower than the €5.5 billion estimated to be needed by the region’s governments to achieve EU or national targets”, pointing to a significant gap in financing. This €2 billion gap in water infrastructure investments means that new sources of finance will need to be found every year if sector targets are to be achieved at current levels of ambition.

Since the State of the Sector report was released in May 2015, very few countries in the region have taken sufficient steps to identify new sources of finance for the water sector, preferring to rely on what seems to be a relatively steady flow of official development finance in the form of grants or development bank loans.



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A good example of this can be seen in Croatia, where the municipality of Rijeka managed to tap into local domestic sources to finance a swimming pool complex by issuing a ten-year bond. The project was deemed to have both social and tourist value and its financing stimulated considerable interest in the local population, including a number of local personalities. This investment has been a stepping-stone for Rijeka to revitalize its beachfront and take on the mantle of European cultural capital in 2020.

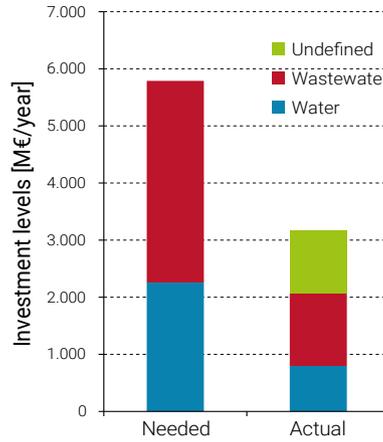
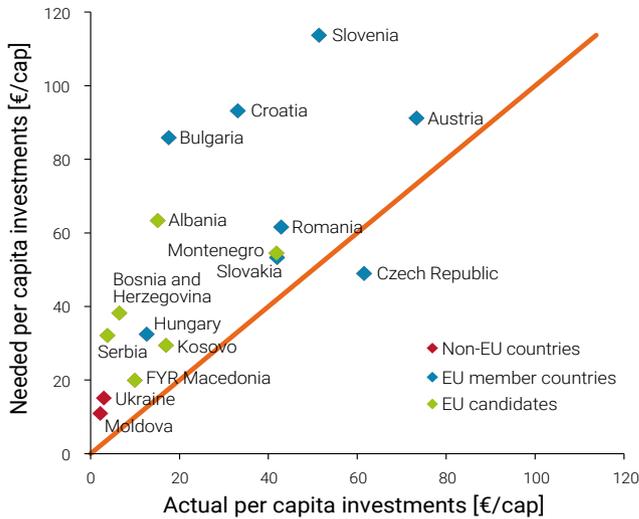
This is an unsustainable strategy however. Official development finance (ODF) will not be sufficient to address the water sector financing challenge. Although ODF for the water sector has been steadily increasing, it has remained relatively modest with US \$14 billion per year being channeled into ODF to the water sector worldwide. Scarce public funds will need to be leveraged much further and used wisely in future.

Using commercial finance

A particularly attractive opportunity lies in the potential for mobilising domestic commercial finance for water. This is an untapped source of finance, which can also provide a profitable investment opportunity for local investors. Commercial finance can take many forms, ranging from microfinance for household investments, supporting local entrepreneurs and domestic bank loans – all the way to issuing bonds on domestic capital markets. Many water sector operators in both the European Union and the United States finance their investment programs through tapping into private sources of finance. Many such operators, especially in the United States, are publicly-owned.

At first sight, commercial finance may seem more expensive than development financing, which is generally provided free of charge, or at favorable concessional rates. But ODF alone is insufficient to meet the needs of wa-

FIGURE 52: ACTUAL COMPARED TO NEEDED PER CAPITA INVESTMENT COSTS IN COUNTRIES OF THE REGION



The Danube Water Program is a partnership programme funded by the Austrian Ministry of Finance and implemented by the International Association of Water Supply Companies in the Danube River Catchment Area (IAWD) and the World Bank.

Source: World Bank. Water and Wastewater services in the Danube region. A State of the Sector Report 2015

ter sector financing in the Danube region and commercial financing can offer many advantages that counteract the higher financing costs over time. In countries with high currency risk and significant inflation, borrowing in domestic currency eliminates foreign exchange risks. It also allows tapping into pools of domestic financial resources that have so far been largely ignored, such as pension funds, institutional or social impact investors, when the latter may be looking for low-risk, low financial return investments with high social benefits. In addition, using commercial finance could help public utilities to introduce robust commercial principles in their operation and management.

This is not a “business-as-usual” approach and will likely face initial resistance on the part of sector stakeholders.

and technical assistance from the World Bank. This helped the government define a realistic “Water for the People” financing plan, with carefully balanced tariff increases and more modest targets than originally envisaged. Furthermore, mobilising commercial finance for service providers that are credit-worthy will allow governments to use scarce public funds in “needier” areas of the sector, such as rural sanitation, where prospects of credit-worthiness are more distant.

to all types of water sector investments, including establishing adequate systems and investing in infrastructure for water security, and ensuring that all water users - farmers, industry or energy producers - use water wisely.

The World Bank acknowledges the role of ICPDR as a successful example of regional, transboundary collaboration in the field of water resources management, with a mission closely aligned with that of the World Bank in achieving a water secure world for all.

So what prevents other cities, or countries, in the region from adopting a similar approach in the water sector? To attract commercial finance, public utilities need to establish themselves as creditworthy, with transparent and sound corporate governance structures and with viable financial performance to recover most, if not all, of their capital and operating costs. At the same time, commercial lenders need to be encouraged to “test the waters” of lending to a non-familiar and potentially political sector.

Governments at both national and local levels need to develop a realistic vision of what it takes to achieve their own goals, in line with EU obligations and SDGs, and in particular to define which targets can be achieved within which timeframes.

With this objective in mind, the government of Albania recently conducted a Strategic Financial Planning exercise, with financial support from the European Union

International financial institutions such as the World Bank can play a key role in facilitating such a transition by supporting strategic financial planning exercises in the region and blending our financial resources with domestic commercial finance resources. This involves, for example, providing technical assistance and capacity building, and co-financing investment packages while putting in place first-loss agreements and providing guarantees. We see this as part of our new role to facilitate and “de-risk” investments so that all countries can have a fair chance of meeting their own ambitious targets under the global SDG umbrella. Such an approach to financing the sector will need to be applied

<http://www.danube-water-program.org/>
<http://www.iawd.at/>

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FACTS: the World Bank

The World Bank was formed in 1944 in New Hampshire, United States with the initial objective of providing finance for the reconstruction of European countries devastated by World War II. Its first loan was to France in 1947, but the bank quickly expanded its activities offering reconstruction support to Latin America, Africa and Asia. In the 1950s and 60s funding for major infrastructure projects, such as dams, electricity grids, irrigation systems and roads, became the bank's primary focus.

In the 1970s the Bank shifted its attention to the eradication of poverty, and in the 1980s began to focus on issues of social development. By this time the bank had expanded its staff to include not just engineers, economists and financial analysts, but also to experts from a myriad of disciplines including public policy experts, sectoral experts and social scientists.

Today the Bank is a leader in the field of international development and poverty reduction. It also works alongside, or in support of, governments, institutions and organisations which all share its common goals.

As the world's largest multilateral source of financing for water in developing countries, the World Bank is committed to achieving the vision of "A Water-Secure World for All". Under this vision, water is effectively managed as a critical resource for the development of support for agriculture, manufacturing, job creation,

private households, and the environment. The Bank's philosophy is that the entire population should be able to share this limited resource and have access to safe and sustainable sanitation and water services, thereby enabling healthy lives. In a water-secure world, countries are able to reduce and adapt to the impacts of climate change on water, while ensuring that each and every single drop is consumed more efficiently.

The World Bank's water portfolio currently covers 175 projects worth US \$27 billion in lending and technical expertise. Around 70% of lending is for services such as water supply and sanitation and irrigation projects. Since 2014, lending for water resources management has also shown rapid growth, rising to 30% of the portfolio in 2017. In

The World Bank's twin goals are ending extreme poverty and promoting shared prosperity by investing in effective and sustainable water solutions that enable universal access to sanitation and water, promote water security, and build resilient societies.

addition, projects with a water sector-related component managed by other global practices of the World Bank total approximately \$10 billion, meaning the Bank's total water-related investments are \$37 billion.

Five priority themes have been identified where action is critically needed to achieve the Sustainable Development Goals (SDGs) for water. These themes do not exist in isolation and need to be implemented simultaneously so that actions under each of these themes can mutually reinforce each other and can contribute to the many other SDGs which are so closely interlinked with the achievement of a water-secure world for all:



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Sustainability

Sustainability is ultimately about ensuring that available resources today can continue to deliver benefits to future generations. The partnership focuses on two critical aspects: 1) the sustainable management of water resources to secure long-term availability, considering the impacts of population growth, rapid urbanization and climate change; 2) adequately built and maintained infrastructure assets.

Inclusion

Inclusion is the process of improving the terms for both individuals and groups based on their inability to take part in society. Water belongs to everyone and yet many are excluded from its benefits. Ensuring that a project enhances the inclusion agenda therefore requires better knowledge of the nature of water inequality, enhancing the capacity of clients and putting in place incentives to enable better outcomes. This requires strong institutions that have the ability to hold states and service providers accountable.

Institutions

Expanding access to and improving the

quality of services can only be achieved and sustained if institutional arrangements provide the right incentives and resources and the organisations tasked with service delivery also have the requisite capacity. Institutions comprise the formal and informal 'rules of the game' within which these organisations operate and, through this, affects the quality and sustainability of services. To strengthen institutions and accountability for service provision, the Global Water System Project (GWSP) has been established to understand the rules of the game and incentive structures have been set up to facilitate a pragmatic change process that is grounded in local cultures, economies, and political circumstances.

Financing

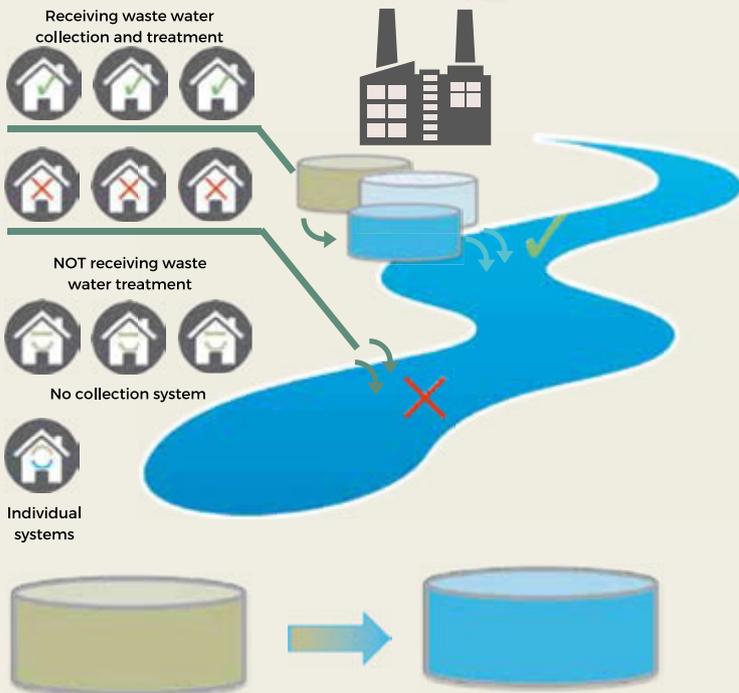
The SDGs come with new and very significant financing needs. For water supply and sanitation, they are estimated to be US \$1.7 trillion, or three times the amount historically invested in the sector. US \$960 billion will be required between 2005/07 and 2050 to ensure water for agricultural production in 93 developing countries. Failure to address water resources

management could diminish national growth rates by as much as 6 percent of GDP by 2050. A two-pronged approach is needed to achieve the SDGs on water: 1) improving the financial viability of the water sector to ensure that "water can pay for water" whilst ensuring affordability of services for the poor; 2) leveraging commercial and non-state sources of financing.

Resilience

Management of water resources and water-related services (water and sanitation, irrigation, etc.) will increasingly be subject to shocks in years to come because of increased climate variability and extreme weather events, such as floods and droughts. Resilient solutions call for strategies and tools at country, basin, and project level that are capable of incorporating not only climate and disaster risk consideration, but also innovative solutions to ease water scarcity constraints as well as socioeconomic and environmental considerations. Building climate resilience will require the development of tools and approaches that can help save lives and livelihoods.

Wastewater Treatment Overview



Primary Treatment



Wastewater is sedimented and passed through several tanks and filters that separate water from contaminants.

Secondary Treatment



Through a process of either biofiltration, aeration or oxidation ponds, this treatment uses oxidation to further purify wastewater.

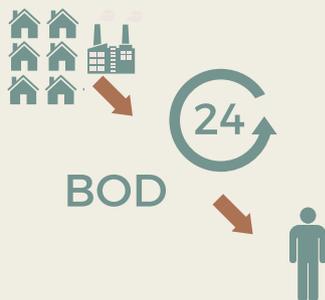
Tertiary Treatment



Phosphates and nitrates are removed from the waste water. Metal salts and micro organisms are used to assist in this process.

What is Population Equivalent (PE)?

PE is the ratio of the total daily amount of biochemical oxygen demand (BOD) produced in an agglomeration to the amount generated by one person per day

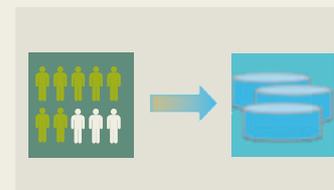
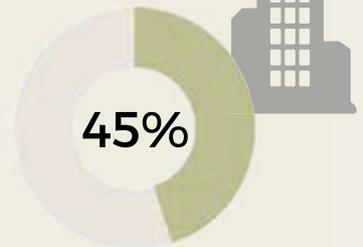


WASTEWATER FIGURES IN THE DRB



A wastewater load of about **88 million population equivalent (PE)** is generated in the basin. There are **5,705 agglomerations** with a PE of **more than 2,000**.

ALMOST HALF (45%) OF THE GENERATED TOTAL WASTEWATER LOAD STEMS FROM LARGE AGGLOMERATIONS ABOVE 100,000 PE



THE MAJORITY (**69%**) OF THE LOADS IS CONVEYED VIA SEWERS TO URBAN WASTEWATER TREATMENT PLANTS.

Primary Treatment

1%



Secondary Treatment

17%



Tertiary Treatment

51%



18%

Settlements having no sewerage



10%

Collection systems without treatment



3%

Handled through individual systems

255,000 tons per year 88,000 tons per year 12,000 tons per year



Emitted into the surface waters from the agglomerations



Along with more than 2,000 PE throughout the basin

64%



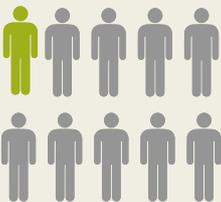
28%



39%



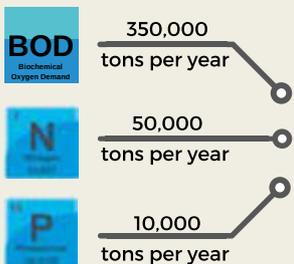
Significant proportions of the total discharges - 64% (BOD), 28% (TN) and 39% (TP) - stem from the **collected, but untreated** wastewater amounts discharged directly into the receiving waters.



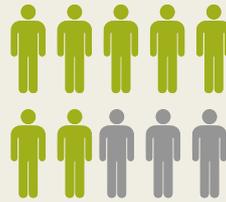
Taking into account that these agglomerations represent only **10% of the total PE** and 9% of the total number of agglomerations in the basin, implementation of measures for a **relatively small proportion of the agglomerations** can result in **substantial progress**.



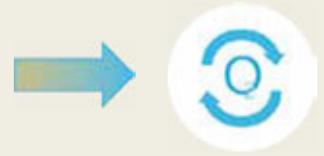
About **16 million PE** are **not connected** to an appropriate collection system or to an adequate treatment system.



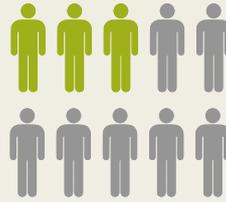
Emitted into the soil, groundwater and small surface waters.



71%



Secondary Treatment



29%



Need **basic infrastructural development** aimed at achieving **biological treatment** for 25 million PE

42 million PE at agglomerations above 10,000 PE



Tertiary Treatment
or treated with local appropriate systems.



Wastewater treatment for 28 million PE at agglomerations above 10,000 PE should be **further improved** by introducing **nutrient removal technology**.



Management Cycle

14.5 Million PE



Treatment Plants

16 Million PE



Upgraded treatment technology

Resulting in further emission decreases in the future



Urban wastewater treatment within European water policy

By the 1980s, pollution of our waters – rivers, lakes, coastal waters and groundwater – had become an inescapable fact, threatening not only the ecology of our water environment, but also human health and economic development including not only urban and rural development, but tourism as well.

Against this background, requests for action at a European level did not only come from the expert community, but also increasingly at a political level. June 1988 saw a Ministerial Seminar in Frankfurt bring together the then 12 Member States

to demand urgent legislative action addressing threats to Europe's water resources, in particular on wastewater discharges and agricultural pollution. In the same year, a European Summit of Heads of States and Governments in Hanover supported these objectives at the highest level.

The political priority of combating water pollution was further underpinned by the relatively swift adoption process by the European legislator: the Urban Wastewater Treatment Directive (UWWTD) entered into force only 18 months after presentation of the legislative proposal.

Main elements of the Directive

The Directive provides for

- wastewater collection and treatment for all but the smallest 'agglomerations' (settlement areas and areas of economic activity of more than 2,000 population equivalents)
- numerical emission control values for wastewater treatment, basically 'secondary' (i.e. biological) treatment as a minimum requirement, plus additional nutrient removal in the catchment of so-called 'sensitive areas', i.e. areas with eutrophication problems
- permit procedures and pre-treatment for industrial wastewater
- monitoring of performance of wastewater treatment plants, and regular reporting; staged deadlines for achieving the environmental objectives in 1998, 2000 and 2005 respectively, depending on the size of the agglomeration and the characteristics of the affected waters. For the new Member States, which joined the EU in 2004, 2007 and 2013, transition periods are part of the Accession Treaties.

With further development and expansion of EU water policy through the Water Framework Directive (WFD), the UWWTD has been integrated into the management framework of the WFD to include river basin management plans and programs of measures, as has the Nitrates Directive.

Implementation experiences

Looking back over more than 25 years of implementation experience, several elements can be considered to be distinctly important. This is true for the adequate delineation of agglomerations, and a careful assessment of various options, from centralised and semi-centralised systems to individual and alternative systems. Construction and operation/maintenance costs need to be duly assessed, as does the impact on affected waters ('good status' to be achieved/maintained). As for individual and alternative systems within agglomerations, the indispensable precondition of 'achieving the same level of environmental protection' is required to shape considerations.

Operation and maintenance of wastewater infrastructure has proven to be as important as planning and construction. This can be seen on a large scale in Malta where almost 100% of the

population is connected to sewerage systems, and treatment plants are in place. However, facilities are not performing properly because 100% of the wastewater discharged is not in compliance with the Directive, not least due to an excess of farm manure being discharged into sewers.

The November 2017 "International Workshop on Wastewater Management in the Danube River Basin" provided further experiences.

Read more on page 6 and 7.

Such political commitments swiftly delivered concrete political action and March 1989 saw the legislative proposal for a Directive on Nitrates Pollution from Agriculture, followed in November 1989 by a proposal for an Urban Waste Water Treatment Directive (UWWTD).



"Sampling in a dark suit" - Water sampling at a German river in the 1950s, covered with foam. Source: University Duisburg-Essen (Germany)

Timely and targeted technical and financial planning has proven to be a crucial element of proper implementation. The neglect of these aspects has, in several cases, led to legal infringement procedures entailing considerable penalty payments.

Benefits – environmental and economic

Concerns about water quality rank amongst the top environmental concerns for European citizens, with 50% of citizens in all 28 EU Member States stating that they are worried about water pollution.

Whilst detailed economic studies on the benefits of good water quality are scarce, figures available show considerable benefits, both in terms of percentage of GDP and of investments vs. economic benefits.

A 1993 study for the island of Rhodes in Greece concluded that preventing degradation of bathing water quality would deliver benefits of 3% to the GDP. Along similar lines, a 1997 study by the Agence de l'Eau Artois-Picardie for the Côte d'Opale in France concluded that benefits of € 300-500 million could be achieved in return for € 150 of investment in wastewater infrastructure. A study on people's 'willingness to pay' for better bath-

ing water quality in a coastal area of the United Kingdom concluded that people were willing to pay an average 25-45 EUR per year for reduced health risks linked to bathing.

The past 25 years of implementation of the UWWTD have delivered a distinct reduction of river pollution, as can be seen in the European Environment Agency comparative maps for 1993 and 2012.

At the same time, bathing water quality, which is largely shaped by wastewater discharges, has drastically improved:

- In 1992, only 67.8% of bathing waters (both coastal and inland waters) complied with the mandatory values of the Bathing Water Directive;
- In 2016, 96.3% of bathing waters complied.



Blackpool beach, United Kingdom: the EU's effect on Blackpool's beaches - 1990 and 2016. Source: The Guardian, 13 October 2016

Challenges ahead: some thoughts

Looking at the UWWTD from today's understanding and from experiences gained, the following thoughts are expressed:

Treatment objectives are also, from today's point of view, up to date. To recall, the UWWTD has been complemented by the 'combined approach' established in the WFD. Where a quality objective or quality standard established under EU environmental legislation requires stricter conditions than those set under emission control legislation, such as the UWWTD, the Industrial Emissions (IPPC) Directive or the Nitrates Directive, more stringent emission controls have to be set and implemented accordingly.

Monitoring and reporting requirements seem – compared to more recent legislation such as the WFD, the Floods Directive or the Bathing Water Directive – to a certain extent vague. However, for a considerable number of years cooperation and joint action by Commission and Member States has achieved solid wastewater reporting based on the principles of WISE (Water Information System for Europe) and contributed to increasing quality and user-friendliness of implementation reports. Looking at the reporting intervals, coordinating these should be seriously considered, as current intervals show quite some degree of 'diversity':

- every two years under the UWWTD;
- every four years under the Nitrates Directive and under the Industrial Emissions (IPPC) Directive;
- every three and six years respectively under the WFD.

Public participation and involvement of citizens and stakeholders does not feature at all in the UWWTD, and transboundary cooperation only to a limited extent. However, it could be argued that all relevant measures linked to this Directive are integrated into the framework of the WFD and thus covered within the transboundary cooperation and public information and participation provisions therein.

At the level of local, regional, national and European budgets, the challenge of the future will be, to a considerable extent, the rehabilitation of aging sewerage systems, in parallel to and beyond the completion of sewerage systems and treatment plants. These sewerage systems date back across Europe partly to the late 19th, early 20th century. Given the considerable amount of financial resources required for such rehabilitation measures, the necessary financial planning will have to take place at all relevant levels.

All involved, decision makers at local, regional, national and European level, experts and stakeholders will continue to face these challenges, for the benefit of our citizens and our waters.



The author: Helmut Bloech is former Head of the Water Sector of the Directorate General Environment of the European Commission. In this position, he was responsible for development and implementation of EU water policy and legislation, including the Water Framework Directive and other directives on wastewater treatment, drinking water, bathing water and flood risk management. Between 2000 and 2010 he was Head of Delegation of the European Union at the ICPDR.

Urban Wastewater Treatment: getting the broader picture

Wastewater from homes, cities, industry and agriculture flowing back into the natural environment without being treated or reused is still causing significant pollution in many regions of the Danube Basin. Without proper wastewater treatment, valuable nutrients are lost and dangerous substances released into the surrounding areas. In addition to posing a significant threat to human health, the impact on water resources and ecosystems is tremendous.

Managing water in a river basin is best done with international cooperation between all the countries in the region, thereby bringing together all interests, both upstream and downstream.

One of the main functions of the ICPDR is to help to protect all waters in the Danube Basin and ensure the sustainable, long-term use of their resources. In 2016, the ICPDR published the Danube River Basin District Management Plan – Update 2015, which sets the priorities for transboundary water management in the Danube River Basin for the period 2015-2021. It also determines the actions necessary to achieve these objectives.

All necessary measures of basin-wide importance have been agreed upon by the Danube countries and are reflected in the national river basin management plans, which are listed in the Joint Program of Measures. This key chapter in the management plan provides an overview of the status of implementation measures, depending on the individual framework conditions that each country is confronted with.

One of the key objectives is the reduction of emissions of organic substances, nutrients and hazardous chemicals stemming

from urban wastewater treatment plants. Enhancing wastewater treatment contributes towards achieving both “good ecological status” and “good chemical status” of the surface water bodies in the Danube River Basin.

To achieve these aims, Danube countries need to invest further in the wastewater management sector. Substantial investment in wastewater infrastructure is planned by the Danube countries to facilitate the connection of 15 million Population Equivalent (PE) to appropriate wastewater collection and treatment systems. Another 16 million households should have access to an upgraded treatment technology by 2021. The Danube countries have expressed their common interest in strengthening capacity building in the wastewater sector.

“Wastewater infrastructure and wastewater collection and treatment have improved at almost 900 agglomerations. Nevertheless, not all measures have been taken and there is still room for improvement.” ICPDR 2017 President Peter Gammeltoft.

Such action is necessary to better design and implement investment projects and to more efficiently operate and maintain wastewater services.

Investing in adequate infrastructure

The Danube countries have made significant progress in the area of infrastructure. Investments in urban wastewater treatment plants with minimum biological treatment technology and enhanced industrial technologies in large agglomerations (10,000 PE) have helped to reduce organic pollution significantly. Since 2005, organic emissions via wastewater have fallen by almost 50% as a result of substantial development. Investment in

Almost 16 million people in the Danube River Basin are not connected to public sewers or appropriate wastewater collection systems. An additional 10 million discharge their domestic wastewater directly into surface waters, without treatment.

urban wastewater treatment infrastructure has also resulted in a remarkable decrease in nutrient emissions.

By 2021, basic infrastructural development facilities – either public sewer systems with adequate wastewater treatment or appropriate decentralised systems – will serve approximately 15 million inhabitants.

ICPDR's direct contributions to SDG 6

The Sustainable Development Goals (SDG), launched in 2015, include a target that ensures that everyone has access to safe water by 2030, making water a key issue in the fight to eradicate extreme poverty. SDG 6 covers the entire water cycle; SDG 6.3 focuses on safely treated wastewater and good ambient water quality while SDG 6.2 requires the safe disposal of all sewage. SDG 6.5 advocates integrated water resource management and transboundary water cooperation both of which are at the core of ICPDR activities.

Hélène Masliah-Gilkarov is the Technical Expert for Public Participation and Communication in the ICPDR Secretariat, and the Executive Editor of Danube Watch

Targets & indicators for SDG6 relevant to the ICPDR's work on wastewater management

6 CLEAN WATER AND SANITATION



Targets

Indicators

<p>Target 6.2</p> <p>By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women, girls and those in vulnerable situations</p>	<p>Global indicator 6.2.1</p> <ul style="list-style-type: none"> • Proportion of population using safely managed sanitation services, including hand-washing facilities with soap and water
<p>Target 6.3</p> <p>By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally</p>	<p>Global indicator 6.3.1 & 6.3.2</p> <ul style="list-style-type: none"> • Proportion of wastewater safely treated • Proportion of bodies of water with good ambient water quality
<p>Target 6.6</p> <p>By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes</p>	<p>Global indicator 6.6.1</p> <ul style="list-style-type: none"> • Change in the extent of water-related ecosystems over time
<p>Target 6.A</p> <p>By 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies</p>	<p>Global indicator 6.A.1</p> <ul style="list-style-type: none"> • Amount of water and sanitation related official development assistance that is part of government-coordinated spending plans
<p>Target 6.B</p> <p>Support and strengthen the participation of local communities in improving water and sanitation management</p>	<p>Global indicator 6.B.1</p> <ul style="list-style-type: none"> • Proportion of local administrative units with established and operational policies and procedures for the participation of local communities in water and sanitation management

Source: <https://sustainabledevelopment.un.org/sdg6>

SOLUTIONS

Background: The SOLUTIONS project is an EU funded project that seeks to provide new and improved tools, models and methods to support decisions regarding environmental water policies. The overall objective of the project is to produce consistent solutions for the large number of legacy, present and yet to be developed chemicals that pose a risk to European water bodies with regard to ecosystems and human health. In doing so, the project is supporting the review of the Water Framework Directive's (WFD) priority pollutant lists.

Initiated by the EU Seventh Framework Programme (FP7), the SOLUTIONS project is tasked with the creation of a conceptual framework for the evidence-based development of environmental and water policies. International river commissions, European Commission working groups and water-works associations are directly supported with consistent guidance for the early detection, identification, prioritisation, and abatement of chemicals in the water cycle. The project's approach provides transparent, evidence-based lists and identifies candidates for River Basin Specific Pollutants (RBSPs), along with their predicted no-effect

Legacy chemicals are often used or produced by industry, and remain in the environment long after their use has been discontinued. Often not regarded as being harmful when they were originally used, legacy pollutants include heavy metals like lead and mercury. DDT (dichlorodiphenyltrichloroethane), which was widely used as a pesticide throughout most of the twentieth century until it was finally banned worldwide in 2001, is a good example of a legacy chemical that still continues to endanger both wildlife and the environment.

concentrations (PNECs). This data can then be used for basin case studies.

In 2013-14 the SOLUTIONS project provided a substantial contribution to the Joint Danube Survey 3 (JDS3) project by analysing samples for a wide range of hazardous substances. This analysis enabled JDS3 to deal with specific pollutants included in the 2015 update of the Danube River Basin Management Plan. The modelling results and the final list of the Danube River Specific Substances produced by JDS3 will be available in 2018. SOLUTIONS will also focus on point sources for JDS4, which is planned for 2019.

The ICPDR is both a project partner and a member of the SOLUTIONS stakeholders board, and by collaborating closely with the project, it aims to deepen its knowledge of the sources and pathways of hazardous substances in the Danube River Basin. To achieve this, point source sampling is being undertaken at twelve urban Waste Water Treatment Plants (WWTPs) in nine countries to establish just what exactly is being discharged into the Danube's waters. The exercise is considered to be a pilot study for JDS4.

Site selection

The selection of the WWTPs to be monitored over the course of the SOLUTIONS monitoring campaign was made based on data taken from the 2012 ICPDR Urban Wastewater Inventory. The objective is to ascertain the participant countries' existing levels of technology for wastewater treatment, with the nine countries taking part representing almost 90% of people equivalents treated in the Danube Basin in 2012. Large WWTPs have mainly been selected to ensure the best technical equipment and the best "know how" is available, thereby guaranteeing the optimal implementation of monitoring activities.

Monitoring of effluents

A harmonised sampling strategy has been adopted, undertaking all analyses in two high-end laboratories to provide homogenous information relating to a large range of organic emerging chemicals and heavy metals. By adopting this approach, the study will contribute significantly to

The sampling exercises were undertaken in close cooperation with the SOLUTIONS team (experts from the Environmental Institute Kos and UFZ Leipzig), the UBA Vienna experts, the PM EG experts, the WWTP operators and laboratory staff and the ICPDR Secretariat.



reducing knowledge gaps regarding hazardous substance emissions. The objectives of the monitoring campaign are to:

- obtain representative chemical patterns from WWTP effluents with different treatment techniques in different European countries (7-day composite sampling)
- compile representative effect-based patterns for the same WWTP effluents (on-site large volume extraction)

- support the recognition of River Basin Specific Pollutants for the Danube River Basin
- provide a pilot study for the next Joint Danube Survey (point source monitoring)
- provide data for scientists and modelers regarding emission, transport, exposure and risk modelling for the Danube River to compare with JDS3 data
- make all data available to the public via the open access SOLUTIONS / ICPDR platform

With these goals in mind, a total of 12 selected treatment plants were sampled between July and September 2017. Laboratory analysis of the sampling carried out is currently on-going (organic parameters: UFZ Leipzig; heavy metals: UBA Vienna). Assessment and dissemination of the results is expected to be completed by January 2018.

In summer 2017 the ICPDR in cooperation with the SOLUTIONS Project launched a specific monitoring campaign to sample the effluents of selected urban waste water treatment plants in the DRB for hazardous substances emission analysis.



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The 12 WWTPs to be sampled and analysed



METEET initiative:

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First workshop on the Integrated Planning of Inland Waterways Transport Projects hailed a success

The Croatian Agency for Inland Waterways hosted a two-day workshop in Vukovar on 28 - 29 September 2017 with the Mixed Environment Transport External Expert Team (METEET). The objective: to enhance the integrated planning of inland waterways transport (IWT) projects.

The aim of the workshop was to provide guidance for water authorities in the Danube region to enable them to address environmental issues that may arise during the planning and implementation of inland navigation projects, while taking into account the need to adhere to European environmental legislation. The workshop was guided by two external experts Alexander Zinke and Jasna Muškatirović from the fields of environment and transport. Mr Zinke is Senior Project Coordinator for Water and Environment in the Surface Waters Department of the Austrian Environment Agency and Ms Muškatirović is Senior Advisor and Head of Department at

the Serbian Directorate for Inland Waterways. The event was observed by the European Commission, the Danube Commission, the ICPDR, and the International Sava River Basin Commission (ISRBC).

Over the course of two days, the participants enhanced their knowledge of European legislation concerning transport and the environment. The Platina Manual on good practices in sustainable waterway planning and the Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin were also discussed in depth.

All participants found the workshop extremely useful, especially the advice, guidance and presentations provided by the experts. This newly gained knowledge will be extremely useful for the integrated planning of future inland navigation projects.

Quotes from the METEET initiators say:

Desiree Oen (DG Move):

*"METEET is important as a pilot project.
"Think about both sides –
transport and the environment – working together"*

Petar Margić (DC):

"The key objective of the METEET project is to provide support during the planning and implementation of inland waterways projects"

Ivan Zavadsky (ICPDR):

*"Problems concerning a lack of cooperation
between transport and environment lead to difficulties.
We need to work together"*

Neven Trenc

(Croatian Agency for the Environment and Nature):
*"The early engagement of experts helps to avoid some of the
problems encountered during project drafting"*

What is METEET?

The Mixed Environment Transport External Expert Team (METEET) was set up as a result of the Joint Statement initiative launched in 2007 by the ICPDR in cooperation with the Danube Commission and the ISRBC.

METEET's purpose is to assist and coordinate with regional inland waterway transport authorities, on a voluntary basis, and to develop and foster an integrated and environmentally friendly approach to infrastructural projects in the field of inland navigation. The team is managed by a steering committee composed of representatives from the Danube Commission Secretariat (DC), the ICPDR Secretariat, and the European Commission Directorates for Mobility and Transport (DG MOVE), the Environment (DG ENV) and Regional Policy (DG REGIO). The ISRBC is an observer. The team's activities are financed by the European Commission.

The METEET team consists of waterway transport and infrastructure experts along with environmental experts to provide advice to regional authorities in developing sustainable strategies, plans and projects in the field of inland navigation. This advice takes into account European environmental legislation from the drafting process onwards in order to analyse impact, constraints and possible mitigation and compensation measures at a very early stage.

The team carries out training missions in countries throughout the Danube River Basin and its experts seek to provide advice to competent authorities in developing sustainable strategies, plans and projects in the field of inland navigation on the Danube. Waterway transport and infrastructure experts also work closely with environmental experts to fulfil relevant EU and international inland navigation requirements in the basin.

For more information, visit:

<http://icpdr.org/main/meteet-initiative-first-workshop-integrated-planning-inland-waterways-transport-projects-hailed>



© Agency for Inland Waterways



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Participants included representatives from:

- the Agency for Inland Waterways
- the Ministry of the Sea, Transport and Infrastructure
- the Croatian Agency for Environment and Nature
- the Croatian Waters and Port Authorities
- the Ministry of Regional Development and EU Funds



The Urban Waste

“ **What is the story behind the implementation of the Urban Waste Water Treatment Directive (UWWTD) in Austria and your personal role in it?** ”

The European Commission has acknowledged Austria in its regular implementation reports as being one of the first member states to be in full compliance with the provisions of the UWWTD. This is because the country had already begun to implement measures for the collection and appropriate treatment of wastewater long before it became a member of the European Union. The country's efforts to tackle pollution began in the late sixties and were a direct result of widespread protests from its people and a marked decline in tourism, a sector of considerable importance in Austria. By this time, excessive discharges of badly treated wastewater had led to the eutrophication of lakes, the severe pollution of rivers, algae blooms, fish kills and an unbelievable stench.

When Austria became a member of the European Union, it already had a comprehensive enabling environment for the appropriate treatment of wastewater. Most of the infrastructure was already in place or on track (some facilities were still under construction or being upgraded). Legislation, that mirrored the UWWTD was also already in place, along with supportive legislation, obliging all households to be connected to the nearest sewer system. Public funding provided ample financial incentives for the establishment of the necessary water infrastructure.

Priority was placed primarily on cleaning up hotspots around lakes, then in centralised urban areas covering the vast majority of wastewater load and finally in densely populated rural areas to ensure a high area-wide level of environmental protection.

Eutrophication is caused by excessive amounts of nutrients entering a waterbody, and have for many decades posed a problem for the Danube River Basin. These nutrients are frequently due to run-off from the land and can disturb the ecological balance along the whole length of the river, causing the water to become murky and clogged with algal blooms. Entire food webs, including valuable fish stocks, can be seriously affected if adequate preventative measures are not taken.

Education and training schemes were run in cooperation with universities to ensure the sound operation of both large and small installations. An integrated monitoring system was simultaneously set up to ensure that the performance criteria of the UWWTD were met all year round.

An association of stakeholders consisting of wastewater treatment plants operators and administrative representatives was also established to ensure high quality exchanges of experiences. Since then, results have shown a dramatic improvement in the quality of Austrian waters with excellent bathing water quality and a booming lake tourist industry. The rather modest contribution of my team has been to harmonise full compatibility of the implementation of the UWWTD with our previous national approach.

What were the main challenges in the early phases of implementation of the UWWTD in Austria to fulfill the EC requirements?

When Austria entered the European Union most of the infrastructure and an enabling environment for sound wastewater treatment was already in place. However, we still had to face two important challenges. The main challenge for my team was to find the most appropriate legal approach to implement the UWWTD. We opted for the approach of article 5 (4) with advanced treatment. This required Austria to ensure that the minimum percentage of reduction of the overall load entering all urban wastewater treatment plants was at least 75 % for total phosphorus and at least 75 % for total nitrogen.

At this time, we were not yet obliged to adopt this approach due to the fact that a number of countries, which were not yet EU Member States, separated us from the coastal areas of the Black Sea and the North Sea, both of which were suffering from eutrophication. The alternative at that time for most parts of Austria would have been limited to establishing secondary treatment facilities, with just a few small sensitive areas being designated for advanced treatment. Our decision was triggered by, amongst other things, our commitments to the Convention for the Protection of the River Danube. Looking back, this decision saved us from the substantial additional costs of having to upgrade our wastewater treatment plants when our neighbouring countries joined the EU and this approach to advanced treatment became obligatory. The second challenge was the administration required to ensure that all data required for the obligatory reporting to the Commission was

Water Treatment Directive

collected on time in a central database at ministry level.

What have been the recent development requirements in the Austrian wastewater sector (maintenance of infrastructure, innovation and training programmes)?

Five decades later, we are now facing new development needs and requests from society. These include climate change, a circular economy, removal of micro pollutants and micro-plastic, digitalisation of operations and the maintenance of an ageing infrastructure.

Establishing an enabling environment for wastewater treatment through cooperation with universities, wastewater authorities and various other partnerships was the initial goal for cleaning up Austria's waterbodies in the late sixties. However, today we are using these same partnerships to deal with new challenges, through research and pilot projects, to develop a sound approach that is tailored to the Austrian situation. In addition, we are providing financial support to make wastewater treatment climate proof. To achieve this, we are working to create solutions to minimise energy needs that include producing biogas and equipping installations with solar panels.

We are also providing financial support for the detailed mapping of the sewerage system and we intend to make it obligatory for all wastewater treatment plants with a



More than twenty years later, what would be your take on the situation?

Looking back I am very happy that our Austrian water infrastructure is in good shape and, in the most cases, run by our municipalities. Personally, I have learnt a great deal. Above all, I am firmly convinced that the main challenge today, at national level, is not just to raise the funds necessary to put the water infrastructure in place; this of course remains a great challenge, but one that can be overcome with the help of European funds. The key challenge for me is to secure an enabling environment for wastewater treatment and its supportive legislation. Cooperation with stakeholder associations, universities and citizens is also vital, as they are the ones who will ultimately have to pay the bill at the end of the day.

population equivalent of more than 20,000 to reclaim phosphorous from sewage sludge. Last but not least, we are doing our utmost to raise awareness of the challenges of maintaining an ageing infrastructure. This includes running campaigns in close cooperation with the associations of water suppliers as well as wastewater treatment plants. A good example of this is the "VORSORGEN" initiative, whereby we are supporting operators and municipalities to estimate investment requirements for concrete water infrastructures for the next ten years with the help of an online tool:

<http://vorsorgecheck.wasseraktiv.at>

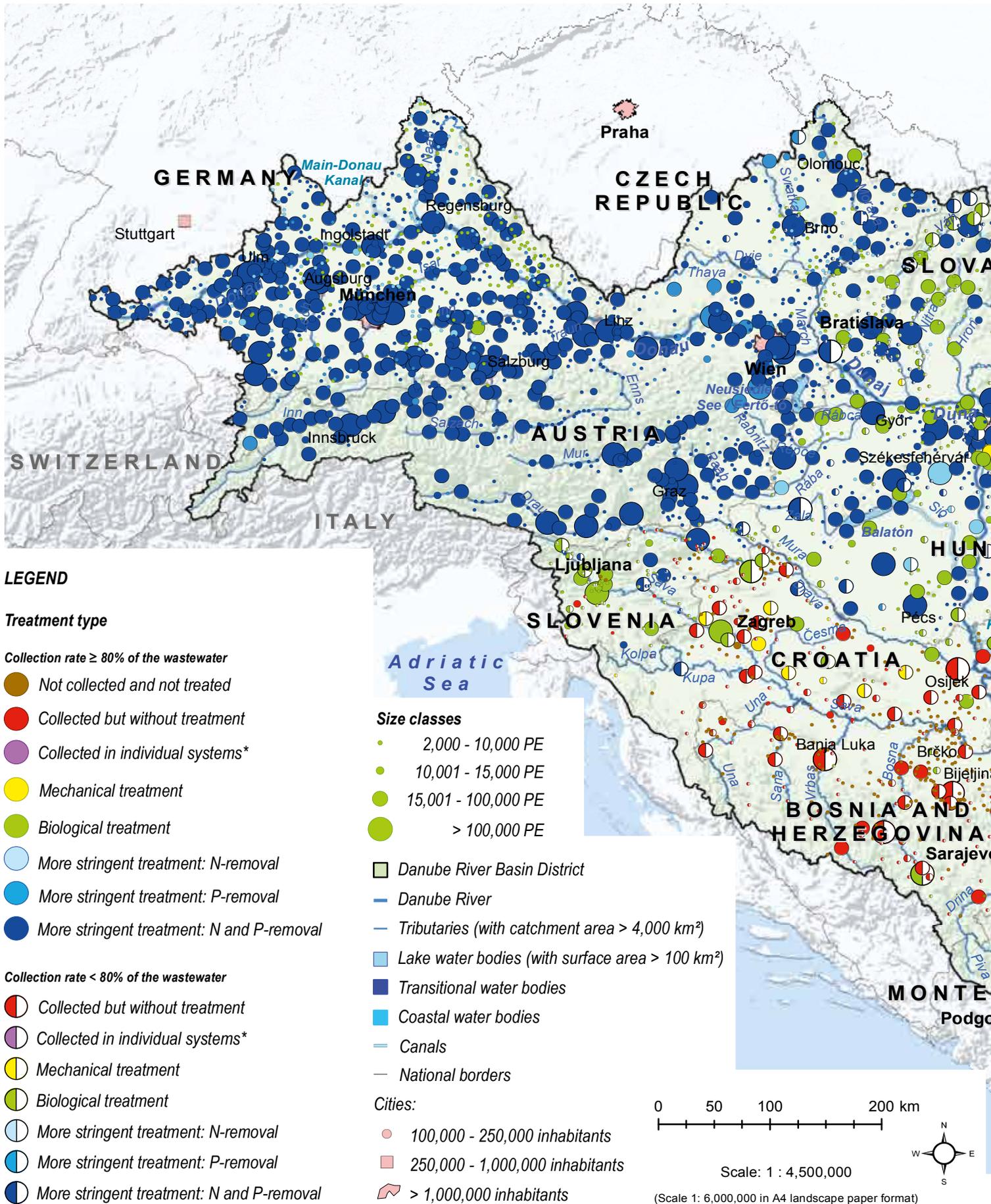
Secondly, I have learnt that wastewater treatment really is a never ending story. Once the infrastructure is in place it has to be operated properly in order to meet the standards of the UWWTD. Moreover, it has to be maintained based on cost recovery and periodically renewed. Finally, new requests from society have to be met. This is why I consider an enabling environment for wastewater treatment, representing an excellent example of Good Water Governance, to be so important and a prerequisite of ensuring an up to date water infrastructure that serves the needs of society 24 hours a day, 7 days a week.

Karl Schwaiger is Acting Water Director at the Austrian Federal Ministry of Sustainability and Tourism (BMNT) and Austria's Head of Delegation to the ICPDR



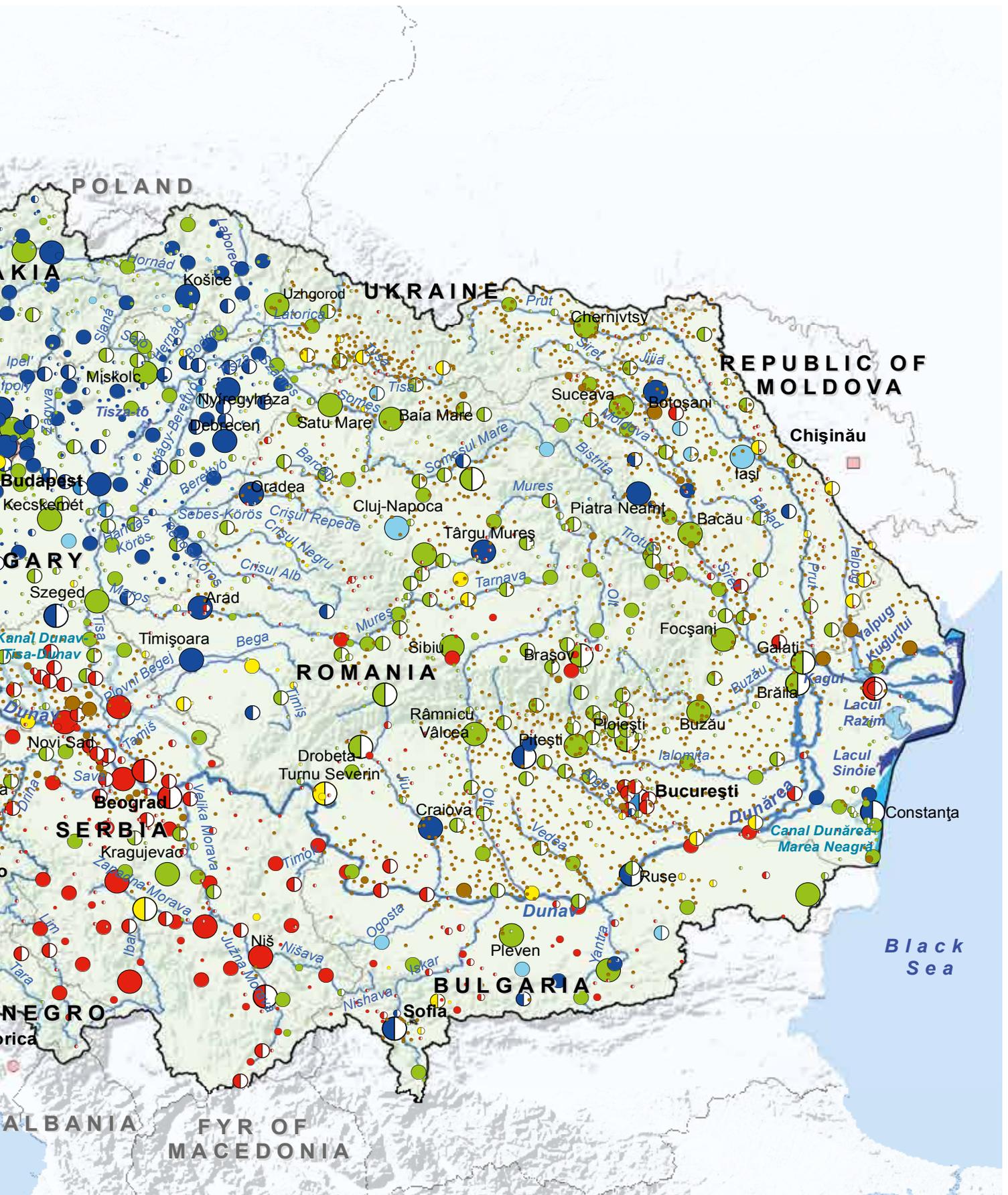
Foldout to learn more about the situation of Urban Wastewater Management in the Danube River Basin (Reference years 2011/2012). The last decade has seen a lot of improvement by the Danube countries with the support of the EU.

Urban Wastewater Treatment – Reference Situation 2011/2012



* Individual or other Appropriate Systems

This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BG, CZ, DE, HR, HU, ME, MD, RO, RS, SI, SK, UA) and CH. EuroGlobalMap data from ESRI World Countries was used; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as elevation data layer; data from the European Commission



Data from EuroGeographics was used for all national borders except for AL, BA, ME where the data from the Joint Research Center was used for the outer border of the DRBD of AL, IT, ME and PL.



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for the Protection of the Danube River**

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