

MISSION (IM)POSSIBLE: KEEPING UP SUSTAINABLE SERVICE DELIVERY IN AN ECONOMICALLY TURBULENT ENVIRONMENT

Expert Consultant Rado Russev and Young Water Professional Amela Basic, Engineer at AQUASAN, took the stage to the sound of the “Mission Impossible” signation to present four complementary viewpoints on the difficult times and turbulences plaguing the water sector.

The first speaker, Camilo Lombana, Senior Water and Sanitation Specialist World Bank, covered the institutional perspective, presenting the Bank’s structured approach to managing change in different utilities.

Remarking that after discussing utility performance improvement for three decades the sector is still in the same place and inviting the audience to view crisis times as windows of opportunity to finally move things forward. Mr. Lombana walked the audience through the Utilities of the Future (UoF) program, the World Bank’s main vehicle to improve utility performance and to put utilities in the driver’s seat on the road to the SDG6 agenda.

The program is usually implemented from three to four years and is flexible enough to tailor interventions to individual needs. It has been successful in a vast variety of utility types and situations. So far, 87 utilities in 33 countries have joined.

The anatomy of innovation: Inside Utilities of the Future

UoF follows a conceptual framework in the shape of a pyramid, with the ultimate goal of service quality at the top, the enabling legal and governance environment at the base, and all relevant factors in between, with the human factor at the center. “We take a holistic approach”, said Mr. Lombana:

“As engineers, we tend to focus a lot on the technical and commercial aspects like non-revenue water. But other aspects are equally important, first among them human resources. You can have the best commercial and technical systems installed, but the whole thing will be unsustainable over the long term if you do not have the necessary capacities at hand.”

The same applies for the program itself, says Mr. Lombana: “Without the buy-in, the ownership of a utility, its management and the whole staff, all efforts are wasted.” Once everybody is on board, UoF works on two parallel tracks, examining the status quo and, while doing that, familiarizing the participants with innovative ideas: “We expose them to practices that worked elsewhere and can help the utility to become a utility of the future: innovative technologies and approaches like involving young professionals in the management, involving the clients, operating without abusing monopolistic positions, building resilience against external shocks, and so on.”

The recently launched UoF Center of Excellence (UoF-CoE) in Tirana, Albania, is a joint effort between the World Bank and the Swiss State Secretariat for Economic Affairs SECO.

Utility of the Future Center of Excellence (UoF-CoE)

The UoF-CoE will expand upon the current UoF program to complement existing capacity development efforts in the region, such as the Regional Capacity Development Network (RCDN) and the Danube Learning Partnership (D-LeaP). It will operate on four pillars, an operations center to manage and implement UoF globally, a knowledge and innovation hub connecting utilities and water stakeholders at local, regional, and global level, a financing facility to improve performance and boost the sustainability of utilities in the Western Balkans, and a project incubator to identify opportunities to further support Western Balkans utilities with strategic infrastructure investments.

Funds will be available to support UoF implementation in up to 50 water utilities in the Western Balkans. The program will provide support for in-depth analysis and development of 100-day action plans and five-year strategic plans for all participants, and subsequently use a competitive mechanism to grant funding to up to 10 utilities for the implementation of short-term measures and/or project preparation. “I Invite all Western Balkans utilities present here to register and apply”, said Mr. Lombana at the end of his presentation: “Utilities have a key role in reaching SDG6. Nobody understands water services better, so we need you on board.”

Next to take the stage was Diogo Faria de Oliveira, President of Portugal Water Strategy, and he told the maybe most inspiring story of the whole congress.

“Those of you who have visited Portugal will know that organization and discipline is not our strength”, Mr. de Oliveira started his presentation. “Now how did we overcome that?”

Turnaround in Portugal

There was a lot to overcome, indeed. In 1992, all important indicators for the Portuguese water sector were way down south. The wastewater treatment was below 28%. Half of the tap water in the country was not safe to drink. “In the Algarve region, water tasted salty because of saltwater intrusions in the groundwater. In the north it was dark as Coca Cola”, Mr. de Oliveira remembers the situation before the start of the water sector reform.

Back then, water and sanitation were a municipal responsibility. They still are today, and getting the local authorities to buy into an ambitious and costly reform was the major obstacle Portugal had to overcome.

From 1986 on, the European Union invested in the country’s water sector, but without a national action plan, improvement efforts went nowhere: “Actually, many new wastewater treatment plants

never worked”, says Mr. de Oliveira. “The municipalities simply did not know how to operate them.”

The EU soon lost patience with the situation and demanded a reform which started out in 1993, operating on four main pillars: laws and regulations, aggregation, tariffs, and technical and financial sustainability solutions.

Changes to the relevant laws allowed the national government to enter the water sector in partnerships with municipalities – and allowed municipalities to opt for private sector participation, not through privatizations, but through concessions and lease contracts. This paved the road for creating a 100% public-owned national water company, Aguas Portugal. It enters partnerships with municipalities and drives sector aggregation by what is called the Multi Municipal Systems Management.

This resulted in aggregated regional structures, with Aguas Portugal as major, and municipalities as minor, shareholders. The multi municipal systems shoulder the “bulk” services, collecting and treating water and selling it to the municipalities, which still manage the distribution and sewer networks and set full cost recovery tariffs. The used wastewater goes back to the bulk service for treatment.

Investments to improve sustainability and resilience started out in three core areas - Algarve, Oporto and Lisbon, with just five treatment plants that cover 45% of the Portuguese population, subsequently expanding to the rural areas, replicated what had succeeded in the urbanities.

To keep all stakeholders aligned, the reform follows national 7-year strategy plans which are also the sound basis for financing negotiations with the EU.

Still not there, but...

Diogo Faria de Oliveira notes that after three decades, the implementation of this reform plan is still underway: “Municipalities are still free to choose their own management models and to participate in aggregated bulk systems or to do it alone. This means the Portuguese map looks like a Swiss cheese, full of holes. But 80% of the country is now covered by aggregated structures in partnerships with Aguas Portugal. 82 out of 278 municipalities chose to aggregate their systems in 12 regional utilities, with the bulk of those entering as late as 2019, driven by financial incentives.

Sector regulation started out as an observing unit, but, as Mr. de Oliveira remarks, “the sector matured, and the regulator matured with it to become the autonomous and politically independent authority we have today. It is great to have it because it builds confidence in investors, operators, and customers.”

Three decades of stubbornly sticking to the reform plan paid an astonishing dividend: “We have moved from 50% safe water to 99% safe water, from 28% wastewater treatment to 86,7%, from 81% network coverage to 97,2%, and from 208 infringement proceedings due to the Urban Wastewater Treatment Directive in 2011 to only two in 2021.”

Subsuming the learnings from 30 years of reform, Mr. de Oliveira remarks: “First and most importantly, you need patience. Next, you have to put together reforms that make sense – both on the national and the EU level. You need sound strategy planning to align all stakeholders,

otherwise they will be all over the place, like flies in the room. You need to aggregate bulk systems, because small municipalities do not have the capacity to invest and manage big systems. If the local authorities in your country can choose to aggregate or not, my advice is put money into financial incentives - it pays. And last, but not least – a strong regulator makes a huge difference.”

AI taking the wheel

Impressed by the spectacular success of stubborn patience, the audience next learned about future technologies – or rather, today’s technologies. Erika Varga, Project Manager at Pure Control in France presented experiences with Artificial Intelligence in the operation of wastewater treatment facilities in the Bretagne region, where a consortium of project partners applied AI-based real-time control to tackle the major headaches for utilities, including operational costs, greenhouse gas emissions, and the latest urban wastewater treatment regulations.

Aiming at optimizing processes within existing infrastructures and with the available equipment, the project group created predictive models of the operations in numerous wastewater treatment plants, combining external factors like energy price, weather situation and carbon footprint with internal data from sensors and equipment controllers, developing digital twins of the facilities to improve operation supervision with an interactive customized performance dashboard, supporting analytics with advanced anomaly detection and energy management and putting the plants on autopilot with optimized real-time commands to achieve specified objectives. These objectives range from aeration optimization with complete nitrogen removal over maximizing the self-consumption of locally produced solar energy to phosphorus removal and reducing NO₂ emissions.

The systems can even replace lacking data input with so called soft sensors that process other available data to predict the missing values. The success is measurable. The systems produce double-digit reductions in the specified target areas.

One good reform and one perfect storm

Last to take the stage was Teodor Popa, CFO at APA Brasov in Romania with a presentation on the recent tariff policy reform in Romania.

“I would ask Camilo to modify the UoF pyramid a bit and place financial management higher up, because usually the engineering guys sit on top of the financial guys and that bothers me, even though I am an engineer myself”, quipped Mr. Popa before he walked the audience through Romania’s troubles with tariffs, energy prices, asset depreciation and smart finance mechanisms.

Much like Portugal, Romania’s water sector is organized through the local authorities. Those are responsible for organizing water services throughout the whole water cycle. Infrastructures are public property. All in all, the sector is a patchwork of 40 public regional operating companies, the private-owned Bucharest utility company plus 900 other public or private service providers.

Mr. Popa compares the cost structure of utilities to an iceberg: “Above the waterline, capital expenditure and minor maintenance are visible. Down below you find major maintenance plus everything else. We are all working in the invisible zone, and where our work is visible, we are bothering people with construction work on busy streets.”

In 1995, a smart financing mechanism was introduced in Romania, and in 2005 it became a law. Water tariffs cover operating expenses, maintenance and repairs, a growing share of environmental expenses like sludge management, financial expenses, company asset depreciation and depreciation-equivalent royalties for network use, and a small profit.

The royalties for public patrimony and the gross profit go into a maintenance reserve fund that is used to secure long-term financing to cover investments.

In 2022, Romania switched from a tariff policy based on volume “polluter pay” to a policy based on business plan-based cost-benefit analysis. Until then, water companies approached the regulator with a tariff proposal that had to be approved by the local authorities.

Now, utility companies submit 5-year plans to an Intercommunal Development Association for approval, the regulator does a technical check, and the tariffs are approved without going back to the local authorities. “This may seem to be a minor detail, but it makes a huge difference, especially in election years”, comments Mr. Popa.

While the change brought a steep increase in water tariffs, utilities like Mr. Popa’s APA Brasov are still struggling: “In 2022, we went through a perfect storm: In some companies, the exploding electricity costs destroyed one year’s profit within two months. At Brasov, the drought forced us to pump water up from 100 meters below. Nobody was prepared for this, and now everybody rushes to do on-site energy generation, photovoltaics, and the likes.”

The session ended with a lively Q&A, with most questions focused on the necessary environment for reforms and the implementation of innovative technologies. From the French experience, Erika Varga names mainly financial concerns and the need to comply with regulations as drivers for AI implementation.

Diogo Faria de Oliveira names political will as the most important reform driver: “You need a sponsor in the Government to make it happen. Fortunately for us, the Portuguese Ministry of Environment was committed to the reform.”

Camilo Lombana sees individual commitment as prerequisite for a reform on the utility level, and whole sector reforms as a very complex task: “You need a number of planets to align to make something like that happen.” What helps is the level of discomfort in the population. “If the people are not happy with the services they are receiving, that usually triggers politicians to move.”