

COMING FULL CIRCLE: WHY WE WORK IN WATER

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We are in the midst of a golden age of water innovation. Resource recovery technologies and intelligent water systems are rapidly advancing. Even water-tech adoption timelines, which have been notoriously slow—albeit for excellent reasons—are starting to shorten.

With all the innovation activity in the water sector, another trend that we are seeing is the enhanced visibility of water among the general public and simultaneous recognition by the dedicated professionals of why we work in the water sector. Water professionals in utility management, engineering, marketing, finance, and academia have always known that we make a difference. As utilities transition from “staying out of the spotlight” to becoming more prominent in the communities they serve, and as understanding of the United Nations’





Sustainable Development Goals (SDGs) grows, we are more explicitly appreciative of the “why of what we do.” That appreciation adds extra fuel to the fire of innovation.

The early 2010s saw an explosion of advances coming to market in the water sector, ranging from phosphorus recovery from wastewater to anaerobic treatments. When the Water Environment Federation’s Technical Exhibition and Conference (WEFTEC) Innovation Pavilion was conceived in 2012, the Water Environment Federation (WEF) and its partners—Imagine H2O and BlueTech Research—focused on start-up companies building businesses around these advances. From the twelve companies featured in 2012, the WEFTEC Innovation Pavilion now features over forty companies. Many of these companies are alumni, which means they are still in business, demonstrating the staying power of these innovations. In the last few years, we have seen intelligent water solutions move to the forefront as resource recovery becomes integrated into standard practice.

COLLABORATIVE GROUNDWORK

There is no doubt that collaboration across the water sector is a vital ingredient in innovation. Take, for example, the Leaders Innovation Forum for Technology (LIFT),

a multipronged initiative undertaken by WEF and the Water Research Foundation (WRF) to help bring new water technology to the field quickly and efficiently. LIFT has advanced innovation across the sector by evaluating technology, benchmarking practices and policies of research and development, and providing a platform for professionals to share information and experiences.

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LIFT also laid the groundwork for another collaborative effort to drive innovation: The Utility of the Future Today, which is a model for utilities of all sizes to achieve more efficient operations, enhanced productivity, and long-term sustainability. Since the Utility of the Future concept was introduced in 2013, many utilities have successfully implemented new and creative programs to address local technical and community wastewater challenges.

The Utility of the Future

Today recognition program was launched in 2016 by WEF, NACWA, WRF, and the WaterReuse Association, with input from the US Environmental Protection Agency. Since then, 110 utilities have been honored for community engagement, watershed stewardship, and recovery of resources such as water, energy, and nutrients.

THE RESOURCE RECOVERY CALL

WEF’s ReNEW Water Project is a new way to highlight—and accelerate—the transition to resource recovery. The ReNEW Water Project utilizes data from national and state databases, publications, and a utility survey, which represents about 25 percent of municipal wastewater flow and about 20 percent of biosolids produced in the US. This first-ever analysis of resource recovery by US water utilities shows significant progress in using biosolids and generating energy, but large growth opportunities in water reuse and nutrient capture still remain.

WEF launched ReNEW to create a bold, aspirational, and public call to action to accelerate resource recovery. The NEW stands for “nutrients, energy, and water.” The first step was establishing the baseline for current resource recovery practices. Later in 2019, WEF will announce goals for water utilities to increase resource recovery

from baseline levels. New data will be collected on a biannual basis and expanded to Canadian water facilities.

THE ONE WATER REALITY

Water is the most important part of resource recovery and of the circular economy. Whether water is reused for irrigation, cooling water, groundwater replenishment, or discharge to a stream providing clean water and habitat for the natural environment. In the water sector, we often hear the term “One Water,” an inspirational concept about total water management. One Water is a great concept at the macro level, because we must take an integrated approach to solve our water resources challenges. However, as an overarching term, One Water is limited, because at the end-use level there are many types of water, as exemplified by the term “fit for purpose.”

Fit for purpose means matching water of a specific quality to a use appropriate for that quality. For example, a water with quality suitable for irrigation

might not be suitable for industrial use as boiler feedwater. Because water can be treated to varying qualities depending on the need, the staff at water resource recovery facilities should be aware of the end use of the product water they treat. This focus on treating to the appropriate use ensures sufficient treatment for public health, environmental, or product needs, while minimizing the cost of overtreating water to a quality level much different than is actually required by the end use.

In addition to water, resource recovery can focus on nutrient recovery through struvite, algae-based treatment, land application of biosolids, or phosphorus recovered from incinerator ash. Energy can be generated through biogas from anaerobic digestion for electricity and vehicle fuels. Meanwhile, new technologies such as hydrothermal liquefaction show promise for additional energy recovery pathways. The water sector can produce clean water fit for purpose, nutrients, and energy in a renewable fashion. We’ve been contributing to the circular economy from the beginning.

THE WHY OF WATER

Water sector innovation has been white hot over the past decade, so now, about that “why.” It has been 10 years since Simon Sinek’s seminal TED talk claiming that “People don’t buy what you do, they buy why you do it.” Seeking to solve their water challenges, utilities have been much more proactive in engaging with their communities and explaining the “why” of water.

Take, for example, Clean Water Services in Oregon. The explosion of microbreweries around the United States gave the utility an idea for a program to start conversations about the reusable nature of all water. The utility began partnering with Oregon home brewers in 2014 to brew beer from reclaimed water, demonstrating that water should be judged by its quality, not its history. The utility produced a batch of high-purity water that far exceeded safe drinking water standards and provided it to local home brewers.



Over the past five years, the beers brewed from high-purity reclaimed water, using the Pure Water Brew brand, have inspired similar efforts across the country in Arizona, California, Colorado, Idaho, Florida, and Kentucky. The beers have been featured at public events, WEFTEC, and the *Craft Brewers Conference*. Such efforts serve to engage industry professionals, public leaders, and imbibers everywhere in this conversation about clean water, not only to promote its role in health but also to support big and small businesses. While the beer-tasting events are fun and engaging, the most important aspect of these efforts is the focus on creating an authentic conversation with the larger community about the “why” of water quality.

GOING GLOBAL

When water professionals learn more about Sustainable Development Goals (SDGs), they realize that the work utilities do locally contributes globally. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet,

now and into the future. At its heart are the “17 Sustainable Development Goals,” or SDGs, which are an urgent call for action by all countries—developed and developing—in a global partnership. These goals recognize that ending poverty and other deprivations must go hand in hand with strategies that improve health and education, reduce inequality, and spur economic growth—all while tackling climate change and working to preserve our oceans and forests.

The SDGs explicitly identify water. Clean Water and Sanitation (SDG 6) “features targets for water reuse, affordability, resiliency, integrated water resources management, reduction in untreated wastewater, and enhanced research and development for water technologies.” In addition to SDG 6, the work of water professionals directly impacts half the SDGs, including Affordable and Clean Energy (SDG 7); Industry, Innovation and Infrastructure (SDG 9); Sustainable Cities and Communities (SDG 11); Circular Economy (SDG 12); Climate Action (SDG 13); and Life below Water (SDG 14).

The SDGs explicitly recognize the value—both locally and globally—of the work that water, wastewater, and stormwater professionals do, and will continue to do. This is the “why” that enables water, wastewater, and stormwater utilities and organizations to increase legitimacy in their relations with customers and stakeholders. It provides a sense of pride to operators, engineers, regulators, academics, businesspeople, and all other water sector-related professionals. It uses a global perspective on water resources to facilitate local watershed-based solutions. ♪

