Driving Carbon Neutrality with Real-Time Online Monitoring and Intelligent Treatment Solutions

By Rick Bacon

Moving and treating water and wastewater are energy-intensive processes that result in considerable greenhouse gas emissions and ultimately contribute to climate change. With concerns about climate change and its impact on the planet continuing to rise, global efforts are being made across nations and industries to reduce their carbon emissions.

The water treatment industry is identified as the fourth largest industrial carbon generator through its use of electricity and chemicals and the embedded carbon in its treatment plants. While the contribution of the industrial and municipal water industry to carbon and greenhouse emissions is significant, the effects of climate change on the world's water supply and its impact on how communities can reliably access clean water are profound. As such, the water industry must embrace more energy-neutral practices to help mitigate climate change and in turn, create a more resilient water supply.

One way for the industry to meet its water treatment goals, while making a meaningful contribution to a water-positive zero net carbon future, is to adopt real-time, online monitoring and intelligent treatment solutions.

Optimizing Operations with Online and Predictive Analytics

Aqua Metrology Systems' (AMS) fully automated online water quality instruments monitor a wide range of inorganic and trace metal contaminants that put at risk human health and the environment. These advanced solutions have been widely deployed in U.S. and European municipal drinking and wastewater facilities and industrial wastewater treatment systems.

These mission-critical instruments support the water treatment industry's carbon reduction efforts by delivering accurate, online, real-time water quality data that are enabling end-users to:

- Reduce their use of energy and chemicals by optimizing their treatment process
- Reduce water loss and frequency of treatment system failures
- Increase water reuse and recovery
- Reduce maintenance requirements
- Eliminate manual sampling logistics
- Eliminate manual monitoring of analyzer performance
- Extend instrumentation asset life

Bulk Chemicals Reduction with Intelligent Treatment Solutions

Designed to remove a wide range of heavy metals and nutrients from water and wastewater as well as inhibit lead, copper and iron corrosion in water transport systems, the AMS SafeGuard™ H2O is an advanced in-situ reagent generation system that is poised to displace the use of toxic bulk chemicals. On-site reagent generation is an affordable, non-hazardous and environmentally sustainable solution — providing a 60% cost savings and a rapid return on investment.

SafeGuard™ H2O is unique in that it generates non-toxic reagents onsite through a fully automated system. This in-situ process produces reagents at a cost demonstrated to be significantly below that of the same reagents delivered in bulk form. Additionally, by generating these essential chemicals on-site, the exposure of industries and municipalities to disruptions in their supply chains for bulk chemicals is significantly reduced. The system can be powered by renewable energy sources, and the reagents can be stored safely to enable electricity load balancing by end-users.

Advanced in-situ reagent generation can help make a significant contribution to the efforts of industries and municipalities to reduce the carbon footprint of their water treatment system by:

- Replacing toxic bulk chemical transportation, delivery and handling
- Lowering electricity use, electrochemistry-based reagent generation based on renewable energy sources
- Optimizing electrical power load balancing, in-situ generated reagent has a long shelf-life and can be stored
- Easily retrofitting into existing water treatment systems, system has a small footprint
- Using and producing non-toxic waste streams
- Recovering resources versus disposing of them
- Ensuring low process water loss
- Providing full-automation, process control and remote performance management

Globally, water demand continues to grow while availability shrinks. Reducing greenhouse gas emissions is key to preventing the detrimental effects of climate change on the environment, water availability and human health.

Improving energy efficiency is an essential part of keeping carbon emissions under control; spurring continuous upgrades to water and wastewater treatment processes that reduce the amount of energy, chemicals and other resources used. By investing in online and predictive analytical solutions, along with advanced intelligent treatment solutions, the global water treatment industry is taking major steps to achieve its twin goals of cost efficiency and carbon neutrality.

About Rick Bacon

Rick Bacon has served as CEO of Aqua Metrology Systems since 2012. Prior to joining AMS, Bacon held senior management and board level positions in the energy, industrial, technology, and water sectors. He has a keen interest in technology start-ups and has successfully led several companies in securing seed and development funding. Bacon holds a degree in Land Economy from the University of Cambridge, United Kingdom.

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