



BY STEPHEN M. SPIWAK

Managing Water **SCARCITY**

WHY WATER CONSERVATION MATTERS TO BUSINESS



he issue of water scarcity has often hit the headlines in the past several years. Some states have gone to court over water rights and access even as others have agonized over scarce supplies. Water scarcity and drought have far-reaching impacts on regional and global economies and ecosystems. More than 20 percent of the world's population lacks access to safe drinking water, and more than 40 percent live in water-stressed areas.

The bottom line is that our water stewardship practices have significant consequences for people, industry, and the environment. As nations develop, industry accounts for an increasing percentage of total water use, often creating conflicts between industrial water needs and water required for agriculture and human consumption. This leads to industry efforts to conserve and reduce water use.

University presidents and their staff of directors understand that the days of unlimited, inexpensive water are almost over. While it remains inexpensive in comparison to other components of the heating and cooling processes, it is often the most visible reflection of the impact on the local environment. Much attention has been focused on this central issue and exploring different methods of assessing and tracking water use on campus to drive awareness and ownership with employees, guests, and the student body. While assessing water footprint and flows is a good first step, it is critical to further identify and understand the solutions and their economic, social, and environmental impacts.

BUSINESS IMPLICATIONS

So why conserve? It's simple: Conservation can have a positive impact on your bottom line, but perhaps more importantly, it can position your system to function successfully in the future as water becomes both more scarce and expensive. Adapting your system so that it can deliver reliable service in the face of water cost increases and usage restrictions will position you as a leader in sustainability and enhance your reputation in providing a cohesive and fulfilling learning environment. Fortunately, there are steps toward water conservation you can take right now to protect this valuable resource for the future. A few of them are discussed in this article.

THE WATER-ENERGY NEXUS

While conserving water is easy to talk about, there are hidden roadblocks and unforeseen issues in implementation. Consider, for example, the water-energy nexus—water and energy are connected, as it takes water to make energy and energy to make water accessible and usable. There are significant costs and ultimately savings associated with this water-energy relationship that need to be considered in a water conservation program. The key is to understand the water-energy relationship as you choose new methods and technologies to address your total campus water footprint reduction goals. For example, you may try to condition the water through mechanical means, but the

energy to run that equipment can outweigh the benefits of the water saved.

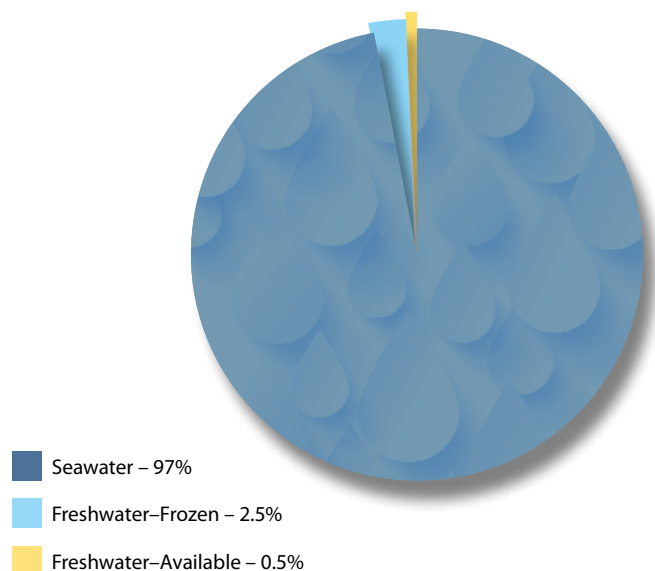
State and federal legislation also plays a key role in campus water conservation efforts. An increasing number of state and federal mandates require industry to achieve a water-reduction goal of 10 to 20 percent. For example, California's Water Conservation Act of 2009 (Senate Bill SBx7-7) requires a statewide 20 percent reduction in per capita urban water consumption by 2020. Water suppliers that fail to meet their water use targets will be considered in violation of the law and face administrative or judicial proceedings after January 1, 2021. The expectation is that there will be significant financial repercussions for those water purveyors failing to meet these new state and/or federal requirements. In the end, the facility departments on a campus and other water users in those areas will feel the pain because the fees will get passed on to the end users, ultimately raising the cost of water.

Finally, you must look at the impact that water use may have on your school's reputation within the local media. How will your water footprint or conservation efforts impact student retention and attraction? Most campuses have seen the student body become active in sustainability issues. Embracing that student body enthusiasm while marketing those efforts in school or local newspapers can result in a true win for the school, students, and facility managers. The approach you use can affect your campus customers (i.e., faculty, students, employees, and guests). Opinions matter and good faith efforts to do the right thing are marketable.

ACTIONABLE STRATEGIES

In developing a plan for reducing overall water consump-

GLOBAL WATER SOURCES



Source: World Business Council for Sustainable Development.

Opinions matter, and good faith efforts to do the right thing are marketable.

tion, one can take a hierarchical approach similar to the reduce-reuse-recycle concept that is often applied to other waste reduction efforts. With this method, we tackle the easiest and least expensive solutions first, and then proceed to more elaborate solutions to attain further savings. The easiest way to reduce waste—of any resource—is to use less of it. For campus central heating plants or any stand-alone HVAC systems, this means running our facilities at maximum efficiency using the least amount of water possible, given our existing equipment. We might also look for ways to reuse some of the water going through the system for a second or third process, thereby getting more “work” out of the same amount of water before it is ultimately discharged. The third step—recycling—would involve treating used process water to make it acceptable for a second or third process.

As providers of heating and cooling, campus facility directors automatically focus on the biggest water users—chiller and

Water Facts Drive Sense of Urgency

The facts illuminate the need to conserve water: Nearly 1 billion people (one in six globally) live without regular access to freshwater. While this sounds surprising, consider that most of the earth's water is salt water. A mere 3 percent is freshwater, and 2 percent of that comes from ice and snow. The remaining 1 percent is surface water from lakes, rivers, etc., which is available for consumption or use.

Let's break this down even further. Nearly 70 percent of the available global freshwater is used for agriculture. In addition, industry accounts for the use of another 20 to 22 percent of that freshwater pie. The rest is consumed by nature and humans. The bottom line is this: Water is scarce, still affordable and, although we don't like to admit it, wasted.

boiler systems. Ideally, however, our efforts should start with the water as it enters the plant. It's important to understand the quality of the water entering your facility as well as where each gallon goes. Document and map all water inlet, usage, and discharge streams. This will provide the foundation for conducting water-balance studies and ensuring that your plant's total water footprint is accounted for.



RESURFACE rather than REPLACE your chalkboards!

- Your quickest, easiest and most affordable solution
- Technically advanced, dry erase writing surface
- Converts an existing board in less than 30 minutes
- Eliminates the potential risk of asbestos exposure
- Avoids costly removal and disposal (landfill) issues
- Creates a chalk dust-free classroom environment
- Protects your classroom technology investments
- Packaged in easy-to-carry 100 ft rolls; ships UPS
- 10 Year Manufacturer's Warranty; Made in USA
- Looks and performs like new, year after year



90 INDUSTRIAL DRIVE • IVYLAND, PA 18974

800-494-5677 • WWW.EVERASE.COM • INFO@EVERASE.COM




THE BRIGHTEST IDEAS IN WHITEBOARDS

There are many water conservation solutions available to facility managers on campus. The key to choosing the best option is understanding the impact of any given strategy on your level of energy use (increased/decreased), overall metered water use, legislation/potential funding from state or local entities, and finally, your school's reputation and need for green accreditation (i.e., LEED [the U.S. Green Building Council's Leadership in Energy and Environmental Design] certification or the ENERGY STAR label, etc.). These are the basics behind defining your sustainable solution to water conservation.

Following is a short list of some of the more common water conservation approaches used on a campus. This list continues to grow as new technology makes it easier to reuse and manage your water supply while supporting your water conservation goals.

1. Use of alternative water sources:
 - Rainwater—geographic-specific, requires good maintenance of stored water
 - Greywater—requires access but can be a cheap resource
 - Recycled wastewater—requires access, sometimes referred to as “purple pipe water”
2. Increased return of condensate to the boiler plant
3. Continuous tower cycle management, with automated fluctuation of cycles based on water characteristics achieving optimum water reuse 24/7
4. Reverse osmosis reject water for cooling tower makeup
5. Water softening in cooling towers, especially in high-cycle, high-volume towers

With so many issues to consider—including understanding a facility's water footprint and how new techniques and technologies are used—this course of action can be difficult. However, taking the time to properly consider the overall impact of water conservation strategies on not only water use but also energy use, asset preservation, and reliability will help campus facility managers customize their strategies and ensure that their facilities' goals are achieved. With fresh, usable water

supplies constantly changing, proactive planning is certain to become critically important. 

Steve Spiwak is a senior industry manager for Nalco, An Ecolab Company, based in Naperville, IL, where he is responsible for managing the North American higher education industry. He is a trained chemist who has written articles and presented at numerous APPA and regional meetings throughout the years. Spiwak can be reached at sspiwak@nalco.com; this is his first article for *Facilities Manager*.

viledon®

HVAC maintenance can be a challenge, particularly in a time of trying to do more with less. Freudenberg understands this and has the products to help. With some of the longest-lasting and lowest pressure drop air filters on the market, the **viledon®** line of filters are there to make you more efficient. If you'd like to take a break from the filter change treadmill, please contact us.



Freudenberg Filtration Technologies is a member of the Freudenberg Group with roughly 1,000 employees at more than 30 locations around the world. We are one of the global technology leaders and a driving force in the field of air and liquid filtration. We dedicate over 50 years of filtration experience to our institutional, commercial and industrial customers.

www.freudenberg-filter.com
garry.pangborn@freudenberg-filter.com
 270-889-3448

Freudenberg
Filtration Technologies

