September 2013

world water INNOVATION

SPECIAL FOCUS

Innovation Showcase

Visualize the potential of the water sector

Water Environment Federation® the water quality people®

innovation showcase

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BlueTech RESEARCH

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Actionable Water Market Intelligence™

BlueTech® Research, an O_2 Environmental company, is an intelligence service focused exclusively on identifying key opportunities and emerging trends in the global water industry.

We are the premier source of actionable water market intelligence for strategic business decisions on innovative technologies and companies.

Our clients use BlueTech® Research for:

- Identifying and assessing water companies and technologies
- Understanding new water technology market opportunities and identifying areas for growth
- Analyzing water technology patent trends and identifying water technology licensing, investment and acquisition opportunities

BlueTech® Research offers analyst directed advisory services, providing market intelligence, technology assessments and strategic advice.

BlueTech® Intelligence Briefings

Need-to-know briefings on key water technology industry developments. Snappy and informative,with distilled details prepared by BlueTech® Research water industry experts.

BlueTech® Innovation Tracker™

Innovation Company Tracker tool to map and analyse water technology companies.

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Detailed reports providing insight and analysis on key water technology market areas.

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WEF Innovation Partner | Join us at Receptions on Monday & Tuesday, October 7th & 8th at 5 p.m

The Future of Water is Coming Fast

"The Water Environment Federation will provide bold leadership, champion innovation, connect water professionals, and leverage knowledge to support clean and safe water worldwide."

Driving innovation is part of the Water Environment Federation's mission. WEF was honored to partner with premier innovators including our partners BlueTech® Research and Imagine H2O to inaugurate the Innovation Showcase at WEFTEC® 2012. This year at WEFTEC 2013, WEF and its partners are hosting an even more robust program and more extensive list of exhibiting companies.

At the WEFTEC Innovation Showcase, we present a forum for market leaders to work with entrepreneurs. Exhibiting companies display emergent technologies to demonstrate their impact, and professionals visualize the potential of the water sector.

WEFTEC 2013's Showcase builds on the successes of the 2012 program with a lineup unparalleled in the water sector. The Bill & Melinda Gates Foundation and the Johnson Foundation at Wingspread are visionary foundations participating this year. Strategic investors and facilitators in the sector are represented by XPV Capital, True North Venture Partners, Veolia Innovation Accelerator, and M3 Capital. Award winners from Imagine H2O, BlueTech Forum, Global Freshwater Seed Accelerator and WEF exhibitors highlight entrepreneurial spirit.

Catalyzing innovation is one of WEF's three Critical Objectives. The amazing achievements and ideas presented at WEFTEC play an essential role in fulfilling this objective. However, innovation is integrated into everything WEF does year round. Earlier this year, WEF, the National Association of Clean Water Agencies, and the Water Environment Research Foundation released the *Water Resources Utility of the Future ...A Blueprint for Action*, which focuses on moving wastewater from a waste to a resource. WEF is partnering with the Johnson Foundation at Wingspread to develop a Nutrient Roadmap, building on the success of the 2012 Energy Roadmap. WEF also supports Water Innovation Clusters including Confluence, The Water Council, and WaterTAP Ontario. WEF works to provide a space for innovation in collaboration with Federal agencies such as the U.S. Environmental Protection Agency and the U.S. Department of Energy to advance concepts like green infrastructure, net-zero energy water resource recovery facilities, and sustainable nutrient recovery.

We invite you to not only attend the Innovation Showcase Pavilion at WEFTEC 2013, but also to commit to catalyzing innovation in the water sector as one of your professional critical objectives as well.

Barry Liner, Ph.D., P.E.
Director, Water Science & Engineering Center

Key Factors in Successfully Bringing Innovative Technologies to Market

A technology is deemed "innovative" if it creatively meets a new or existing need and offers performance, cost, or energy advantages. However, innovation does not guarantee success or market penetration. While the innovative characteristics of a technology are advantageous, there are more factors involved in success and the ability to capture significant market share.

By Joan Steiger, BlueTech Research

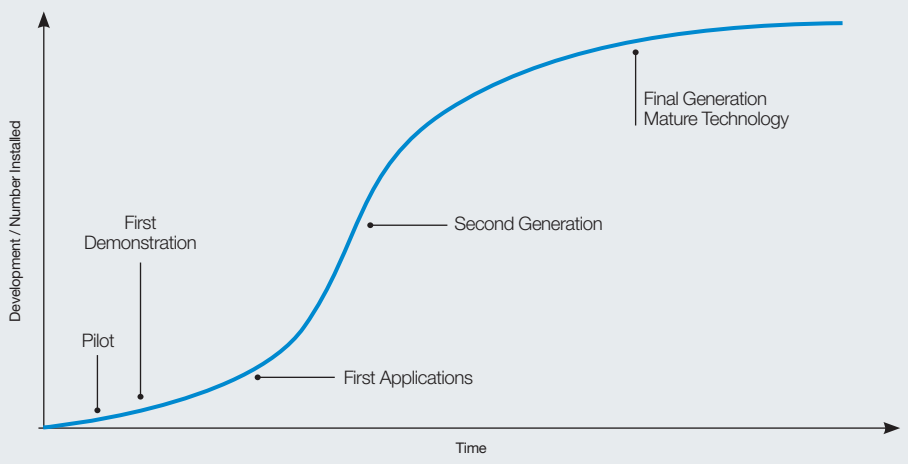
Denny Parker, director of technology at Brown and Caldwell, knows this firsthand. Throughout his career, Parker conducted extensive research within this field, particularly in technology development as well as testing and validation for new processes. He researched technologies that his firm wanted to make available for clients, including a number of his own inventions. In a 2011 Water Environment Research article, *Introduction of New Process Technology into the Wastewater Treatment Sector*, Parker analysed the life cycle of successfully introduced wastewater treatment innovations.

The curve he developed for market penetration had an S shape as it followed the technology through piloting, demonstration, full-scale application and refinement, and finally to mature technology status. In previous work with the S curve, Parker and his associate, Henryk Melcer, noted that many innovative companies fail to gain a market foothold because, after piloting their technologies, they are unable to obtain a completely successful first demonstration and lack the capital for investments necessary to further development.

Innovators and early adopters are key players in moving from bench or pilot studies to the full-scale demonstration stage. In a general analysis of commercial product introduction, Everett Rogers, author of the 2003 book Diffusion of Innovations, shows a normally distributed curve when plotted against sales per unit time. From this, it is readily apparent that the familiar S curve is generated by accumulating product introductions with time. Roger's work showed the diffusion of new technologies with a focus on the characteristics of those who adopt the technology.

Parker noted that when the S curve is viewed in combination with Rogers curve, it illuminated a very interesting fact: innovators serve as gatekeepers to demonstration of new technologies, while early adopters are important in the diffusion of the technology and influence other decision makers within

Figure 1: S Curve for life cycle of new process introduction showing development and cumulative number of installations versus time



Innovators and early adopters are key players in moving from bench or pilot studies to the full-scale demonstration stage.

Early adopters help diffuse new technology and influence decision makers in their networks.

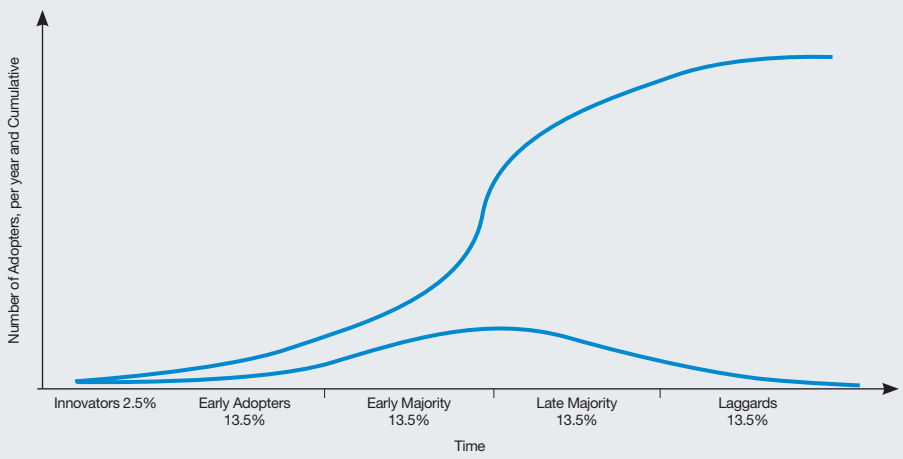
their networks. As such, the role of innovators and adopters becomes essential when trying to take a technology to the wastewater market. They make the choices that ultimately decide the fate of the technology and whether it is chosen for demonstration. These early adopters include such entities as utilities and government institutions, but are more accurately the individual leaders within those organizations.

Highlighting the importance of early adopters points to the question of how they created a compelling business case evaluation. What influences and reasons led to the ultimate decision? Were they more social, economic, or technical? Did the national government play any role in influencing decision makers or providing direct support?

To learn more about the role of innovators and adopters and to answer these questions, don't miss the "Innovative Utilities and Early Adopters" panel in the WEFTEC® 2013 Innovation Pavilion.

Moderated by Denny Parker, the discussion will include how utilities successfully pushed technology adoption and will address the process of technology validation with a focus on testing. Featured panellists include Sudhir Murthy of DC Water, Aik Num Puah of Singapore PUB, and Booky Oren of Booky Oren Global Water Technologies, who all served as early adopters of innovative technologies.

Figure 2: Diffusion of technology with time, adoptions per year and cumulative with time, along with classes of adopters (after Rogers, 2003).



Parker has discovered key elements to successfully bringing an innovative technology to market. These points are summarized below:

1. Government funding played a large role in the development of new technologies in bench-scale, university settings and in demonstration plants. Without such assistance, private equipment or process companies can exploit only a few of the developments they generate or that are presented to them as opportunities.

2. Technologies with rigorous marketing and advertising campaigns were effective and led to explosive rates of growth as compared to technologies and processes that did not have strong marketing tactics. Marketing support typically comes from vendors offering the technologies, but in the case of unpatented technologies, government or foundation check-offs or acknowledgements and conference technical presentations can also play key roles in bringing the technology to the marketplace.

3. Transparency of information allows potential users and consultants to fairly evaluate the new technologies, assess the benefits, and evaluate the risks involved in comparison to current technologies.

4. Numerous market drivers influence new technology introductions, including economic and sustainability goals for utilities, tightening regulations, population or load growth, the push to intensify treatment that is site constrained, and replacement of aging infrastructure.

5. The cycle for new process technology introductions can be excessive and can last five to ten years before implementation. Part of this is the long study, design, and construction cycle times for major capital projects at wastewater treatment plants. Because of this, it can take a long time to learn from the earliest applications and to make improvements in the next generation of the treatment process. New regulations put into place during this time can either adversely or positively affect the pace of new technology adoption.

The Village Creek Water Reclamation Facility generates both energy and steam. The steam is used to power two of the plant's aeration basin blowers.

Fort Worth Water Resource Recovery Facility:

Turning Industrial Waste Challenges Into Energy Opportunities

By Kristina Twigg, Water Environment Federation

Fort Worth's Village Creek Water Reclamation Facility lies on Trinity River's west fork. Every day, the plant treats more than 378,541 m^3 (100 million gallons) of wastewater. With about 6437 km (4,000 miles) of sewers, the wastewater, carried largely by gravity, can take 8 to 12 hours to travel to the plant. Within this time, wastes can go septic, and high-strength industrial wastes can be problematic for local industries to dispose of.

However, the Village Creek plant has turned the problem into an energy solution and now generates 75% of its electricity onsite.

"The plant's co-digestion program has shifted the industrial wastes to a point in the plant where their energy can be harnessed," said Madelene Rafalko, senior professional engineer. "By injecting these concentrated wastes directly into the digester, the plant has decreased the amount of energy needed for aeration treatment."

Village Creek Water Reclamation Facility generates 75% of its electricity onsite and saves energy using steam-powered blowers.

Top: Biogas, used to generate energy via the plant's turbines, is created in these anaerobic digesters fitted with linear motion mixers.

Left: Using anoxic zones in the aeration basin improves energy efficiency at the Village Creek Water Reclamation Facility.

Right: The co-digestion building is where the plant receives industrial wastes. Operators ensure that the wastes do not contain chemicals that would upset the anaerobic digestion process.

With the addition of co-digestion waste, the plant has doubled its gas production. However, plant staff are very selective about the wastes they bring in. "We are looking for wastes with high COD [chemical oxygen demand], which are more easily converted to methane," said Jerry Pressley, water systems superintendent. The plant looks for wastes that produce a high gas yield with low residuals but avoid wastes with sulfides and sanitizers because they can cause process upsets, such as digester foaming.

For 10 minutes every hour, the high-strength wastes are injected into six of the plant's 14 anaerobic digesters. The plant has been capturing the biogas generated from the digesters for decades and uses it to power one of two 5.2 megawatt turbines. These turbines generate about half of the plant's energy use, and most of that energy is used for the plant's aeration system.

In the process of using the turbines to generate electricity, heat is also created. The plant has harnessed this heat to make steam, which powers two of the plant's blowers. The heat is also used to warm buildings and the anaerobic digesters during the winter. Even the steam is not wasted – it is condensed and reused.

"The cost savings from the steam process has paid for everything else," Rafalko said. The project started in 2007, and "it has saved $3 million so far."

While the steam process is the largest part of the plant's energy efficiency program, staff have also taken advantage of low-hanging fruit, such as optimizing process controls, upgrading pumps and motors, replacing its SCADA system, and installing a web-controlled lighting system. "Going through and taking measures, helped us to identify maintenance needs and further energy improvements," Pressley said.

The plant also created anoxic zones in six of its 13 aeration basins. In the presence of oxygen, bacteria convert ammonia to nitrate (NO_3^-). Then in the anoxic zones, the bacteria can utilize the oxygen present in the nitrate. This eliminates mechanical aeration in these sections of the basins, further reducing the plant's energy needs. These improvements bring the facility one step closer to Assistant Water Director Sebastian Fichera's goal of Net Zero Energy.

Want to hear more about the Village Creak Water Reclamation Facility's energy program? Come to the Innovation Pavilion (Booth #775) at WEFTEC® 2013 to see Session 623 Utility Energy Efficiency Case Studies Roundtable on Oct. 9 from 1:30 to 3:30 pm.

The Innovation Showcase Pavilion

McCormick Place, South Hall, Booth #775

Monday – Wednesday, Oct. 7 – 9 9:00 am – 5:00 pm

Cutting-edge products and services brought to you by WEF and our innovation partners, Imagine H2O and BlueTech® Research, are housed in this pavilion. Featured exhibitors include finalists and winners of the Imagine H2O Water Innovation Prize, the 2013 BlueTech Forum Showcase, and WEF's Innovative Technology Award. The theater in the Pavilion includes exciting programs and discussions about innovative ideas, businesses, and practices.

Educational Sessions

The Innovation Pavilion theater will feature a number of educational sessions focusing on innovation topics throughout the week.

Innovative Utilities and Early Adopters

Hear how utilities have played a key role in moving innovation forward and learn how you can benefit. Also hear from winners and finalists of the second annual Operator Ingenuity Contest highlighting creative ideas put into practice by operators.

Visionary Exhibitors

Exhibitors are on the forefront of innovation and product development. Visit with company representatives, and hear from them in several showcase sessions.

Networking

Turn acquaintances into colleagues and expand your network. Networking receptions will be held Monday and Tuesday from 5:00 pm – 6:00 pm in the Innovation Pavilion. These energetic gatherings help investors, strategic partners and entrepreneurs, make the connections that move the industry forward.

The Innovation Showcase Pavilion
Monday, October 7

Innovation Showcase Program at a Glance

Monday, October 7 1:00 pm – 6:00 pm

1:00 pm	229 WEF Innovative Technology Award Showcase
2:30 pm	230 Gas, Diesel or Fertilizer: Innovations in Biosolids
3:00 pm	**204: WEF Exhibitor's Innovative Solutions
4:15 pm	232 Facilitating Water Innovation
5:00 pm	Networking Reception

** This session is part of the Innovation Showcase but is located in Exhibit Hall Booth #367

Session 229
WEF Innovative Technology Award Showcase

Monday, October 7 1:00 - 2:30 pm
Moderator: Alec Mackie, JWCE
Assistant Moderator: Chris Enloe, Instrument and Supply, Inc.

WEF's award for innovative technologies recognizes companies that have introduced new, innovative products and services. Learn about their ingenious ideas directly from presenters during this showcase. This year's Innovative Technology Awards cover the spectrum of wastewater and even stormwater treatment – from collection system pipe assessment to solids thickening to disinfection technologies. One awardee uses electrical current to assess pipe condition beyond the capabilities of visual CCTV inspections. Another awardee presents next-generation thickening centrifuges that achieve higher capacity with lower energy consumption. Also hear from a company that combined several UV technology system improvements into one package for wastewater or stormwater applications. Finally, see how another company has applied pasteurization technology to wastewater disinfection using waste heat from renewable energy biogas systems.

2013 Innovative Technology Award Winners

Pasteurization Technology Group / *Greg Ryan*
California-based Pasteurization Technology Group (PTG) is a rapidly growing company that is revolutionizing the disinfection of wastewater. PTG's systems feature its patented "two-for-one" technology that combines eco-friendly wastewater disinfection with the generation of renewable energy. Visit this company in the Innovation Pavilion to see their winning X-500 technology.

Electro Scan / *Chuck Hansen*
Electro Scan's ES-620 technology finds defects in sewer pipes not seen by traditional closed-circuit television inspection cameras, laser profiling, dye flood, or smoke testing. Its patent-pending process uses a focused array of low-voltage/high-frequency electrical current to examine the walls of pipes. If a pipe is in good condition, no electric currents will be able to "leak" or escape out of the pipe, unless there is a crack. Electro Scan's ES-620 finds all bad joints, defective service connections, and breaks in a pipe, and has the ability to certify relining and point repair projects as leak-free. See more at Booth #620.

Trojan Technologies / *Wayne Lem*
No longer should large wastewater facilities feel limited to chlorine disinfection. Now – with the TrojanUVSigna™ – those facilities can confidently choose UV and benefit from its inherent safety features, cost-saving advantages and disinfection performance. Specifically designed for large-scale disinfection applications, the TrojanUVSigna incorporates our latest innovations, including TrojanUV Solo Lamp™ Technology, to reduce the total cost of ownership and drastically simplify operation and maintenance. It is the ideal solution for those facilities wanting to easily and cost-effectively convert from chlorine to UV disinfection. See more at Booth #1420 and #1221.

Centrisys Corporation / *Mike Sargent, Josh Gable, Andre Adams*
Centrisys has introduced the new THK line of thickening centrifuges and demonstrated remarkable savings in polymer and energy usage. There are also savings in space and odor control. The centrifuge has a much smaller footprint than a DAFT or belt thickener and keeps sludge entirely enclosed, so odor control is easier. See more at Booth #2619.

Session 230
Gas, Diesel or Fertilizer: Innovations in Biosolids

Monday, October 7 2:30 pm – 3:30 pm
Moderator: Lisa McFadden, Water Environment Federation

The latest in biosolids management methods and technologies will be presented in the Innovation Pavilion Theater. From a renewable diesel technology that won the U.S. EPA Green Chemistry award in 2012 to biogas cleaning technology adapted from the semiconductor industry, these presenters are advancing the sector in innovative ways. Session presentations will include:

Is the Commercial Grade Fertilizer Industry Ready for a Sustainable Ingredient?
J.F. Donovan, CDM Smith; J. C. Burnham and B. R. Jarrett, VitAg Corporation

Development of a Biosolids Composting Facility for Large and Small Scale
B. Fuchs, W. L. Gore & Associates

Biogas Upgrading Lessons From the Semiconductor Industry
N.E. Megonnell, ATMI

Renewable Diesel From Biosolids
Cornelius Shields, KORE Infrastructure

The Innovation Showcase Pavilion
Monday, October 7

Session 204
WEF Exhibitor's Innovative Solutions

Monday, October 7, 2013 3:00 pm – 4:30 pm
Exhibit Hall Booth #367
Moderator: Chris Enloe, Instrument & Supply, Inc.
Assistant Moderator: Alec Mackie, JWC Environmental

Exhibitors are on the forefront of innovation and product development. This session highlights several key companies that are truly innovators. Processes and technologies featured include a new approach to nutrient removal - biological filtration; an efficient means of delivering gases to process streams that saves money and power and reduces waste; and a technology that increases efficiency, saves energy, and increases treatment capacity in existing infrastructure.

Improved Deep Bed Denitrification Filter Solves Changing Nutrient Limit Problem
Tom Getting, Xylem-Leopold

Innovative Oxygenation Technology Solves Collection System Odor and Corrosion Control
Chris B. Milligan, BlueInGreen

New Diffuser Design Results in Huge Energy Savings for Wastewater Treatment Plants
Mark Gehring, Xylem-Sanitaire

Session 232
Imagine H2O Presents Facilitating Water Innovation

Monday, October 7 4:15 pm – 5:00 pm
Moderator: David Henderson, XPV Capital Corporation

Innovation takes vision, talent, determination, risk management, and money. Hear from innovative project delivery financiers who help fund public private partnerships, targeted capital investment firms who help fund water entrepreneurs, and strategic investors who mentor and provide technical and financial resources to start-up firms.

Panelists:
Yann Moreau / Veolia Innovation Accelerator
Steve Kloos / True North Venture Partners
Thad Wilson / M3 Capital

Innovation Reception

Sponsored by Blue Tech Alliance and the Government of Illinois
Monday, October 7 5:00 pm – 6:00 pm

Join our innovation partners, Imagine H2O and BlueTech Research, and our sponsors, Blue Tech Alliance and the Government of Illinois, in a networking reception. Turn your curiosity about innovation into knowledge and your contacts into connections.

The Innovation Showcase Pavilion
Tuesday, October 8

Innovation Showcase Program at a Glance

Tuesday, October 8 9:30 am – 6:00 pm

9:30 am	331 Engineering for International Development
11:00 am	332 Imagine H2O Winners and Finalists
12:30 pm	432 BlueTech Forum Award Winners
1:45 pm	433 Global Freshwater Seed Accelerator Winners
2:45 pm	434 Water Research Center (WRC) at Georgia Power's Plant Bowen
3:00 pm	**402 BlueTech Research – Bringing Innovative Technology to Market
3:15 pm	435 Smart Water Management: Practical Lessons From Alliance For Water Efficiency
5:00 pm	Networking Reception

** This session is part of the Innovation Showcase but is located in Exhibit Hall Booth #367

Session 331
Engineering for International Development

Tuesday, October 8 9:30 am – 11:00 am
Moderator: Ari Herrera, UPADI

WEF is pleased to support and learn from professionals who are providing aid to the developing world. We have held several sessions over the last few years, and they have been extremely popular. This year promises to be just as exciting with half hour presentations from the following speakers:

Students and Sanitation in Columbia
Ari Herrera, UPADI (The Pan American Federation of Engineering Societies)

Sanitation as a Business
Sherina Munyana, Water for People

Gates Foundation: Reinventing the Toilet, Omni-Ingestor, and Omni-Processor
Carl Hensman, Gates Foundation

Session 332
Imagine H2O Winners and Finalists

Tuesday, October 8 11:00 am – 12:00 pm
Moderator: Scott Bryan, Imagine H2O

Imagine H2O provides a path-to-market opportunity to promising water businesses. This session features four water technology companies identified by Imagine H2O's annual business innovations program. Hear how these companies are gaining customers and working with partners to successfully implement innovative water solutions. WEF is a proud sponsor of Imagine H2O, a nonprofit organization that inspires and empowers people to turn water challenges into opportunities. Featured companies and speakers include:

Bilexys / *Tony Keating*
Bilexys uses a technology that converts wastewater into chemicals that can then be reused in the treatment process, reducing the need to purchase them separately. Visit this company in the Innovation Pavilion.

PaveDrain / *Doug Buch*
Mitigating storm water through arched paving bricks, PaveDrain incorporates an arch design in the middle of an articulating concrete block to create an internal storage chamber that can be filled with storm-water runoff while simultaneously providing strength for heavy vehicular loads. Visit PaveDrain in the Innovation Pavilion. Doug Buch will also speak in the Stormwater Pavilion (Booth #5216) on Oct. 7 at 1:30 pm.

NGen Corporation / *Yaniv Scherson*
NGen Corporation pioneered a biological wastewater treatment process that removes nitrogen and phosphorous from wastewater to generate renewable energy. Visit this company in the Innovation Pavilion.

NLine Energy / *Matthew Swindle*
This company converts wasted energy found in water transmission and distribution systems into renewable energy. Visit NLine Energy in the Innovation Pavilion.

Session 432
BlueTech® Forum Award Winners

Tuesday, October 8 12:30 pm – 1:30 pm
Moderator: Jeff Guild, BlueTech Research

Each year at the BlueTech Forum, BlueTech Research identifies innovative and disruptive technologies in the global water market for the BlueTech Forum Showcase. These groundbreaking technologies provide solutions for key water industry areas, including food and beverage, oil and gas, agriculture and smart water. Each company is rated by BlueTech Forum attendees, who include leading industry executives, influencers and innovators. The Disrupt-o-Meter™ Award is presented to the company with the most potentially disruptive technology, and the BlueTruffle™ Award is presented to the company based on the strength of its go-to-market strategy. Featured Companies include:

Crystal IS
Crystal IS' UV disinfection technology was selected as this year's most disruptive technology. UV-C LED's lamps are mercury-free, are able to instantly reach 100% intensity after activation, and have a longer life than traditional UV lamps because their lifetime is not dependent on the number of on-off cycles. Applications include monitoring, purification, and sterilization in the water, food, air and healthcare sectors. Visit this company in the Innovation Pavilion.

Session 432 (continued)

Voltea

2013 BlueTruffle™ winner Voltea offers a capactive deionization technology (CapD-I) that removes ions from water using electricity at a lower economic and environmental cost than any other available technology. Visit this company in the Innovation Pavilion.

Hydration Technology Innovations (HTI)

HTI has developed the most advanced form of water and wastewater filtration membrane technology in the world through the application of Forward Osmosis. The company has more than twenty years of experience in the research and development of advanced separation membranes, manufacturing, water filtration, and recycling systems. HTI is the pioneer and global leader in the manufacture and commercialization of complete water and wastewater treatment systems utilizing Forward Osmosis. Visit this company in the Innovation Pavilion.

Pasteurization Technology Group (PTG)

The Pasteurization Technology Group use waste heat at wastewater treatment plants to pasteurize treated wastewater using a series of heat exchangers. This approach eliminates the need for alternate disinfection processes such as chemical disinfection or ultraviolet disinfection. Visit this company in the Innovation Pavilion.

Session 433
Global Freshwater Seed Accelerator Winners

Tuesday, October 8 | 1:45 pm – 2:45 pm
Moderators: Elizabeth Thelen, The Water Council
Linda Reid, J.D, Institute for Water Business at University of Wisconsin-Whitewater

The Global Freshwater Seed Accelerator is one of world's first mentor-driven accelerators focused on startups that address global challenges in freshwater. This accelerator was developed by The Water Council, assisted by the International Water Association and its Wisconsin partners – the Wisconsin Economic Development Corporation and University Wisconsin-Whitewater. Winners and participants include:

Alga Bionics LLC / *Jun Yoshitani, Hensley Foster, Ann Wick*

Alga Bionics LLC offers engineered solutions for remediating polluted water based on applied algae science. An important component of our business is to produce useful by-products including bio-fuel, animal feed, and fertilizer. Our mission is to provide systems that mimic nature using low resources consistent with the concept of a sustainable environment.

Noah Technologies, Inc. / *David Rice*

Working to address the need for early warning systems for water leaks, Noah Technologies has developed software that alerts home and building owners of such an occurrence. Additionally, once a leak has been detected, a coded wireless signal is sent to a receiver to close the main water valve.

H_2Oscore / *McGee Young*

In an effort encourage informed water choices, H_2Oscore uses real-time electronic dashboards to connect consumers to their water usage and educate about the correlation between water usage and water supply. Beginning as a collaborative learning effort from environmental policy courses at Marquette University and the University of Wisconsin – Whitewater, H_2Oscore's services and software are in use at several local municipalities.

Microbe Detectives / *Trevor Ghylin*

Using cutting-edge technology and comprehensive genetic databases, Microbe Detectives are able to identify and quantify nearly all bacteria in microbial communities – including water. Unlike other microbial investigative services that rely on microscopic observation, culturing or chemical analysis, Microbe Detectives utilizes DNA sequencing technology to identify bacteria and solve water problems. Currently focused toward municipal agencies, the company will work to expand to other markets.

Vegetal Innovation & Development / *Gaelle Berges*

The American subsidiary of French company, Le Prieuré, Vegetal i.D. is focused on the art and science of green roofs. They have created an innovative system to control runoff from green roofs with a constant and minimal flow rate. The company is focused on creating alternative solutions for stormwater management, as well as increasing their presence in North America.

Hanging Gardens / *Tony Mayer*

Hanging Gardens provides all the components to a complete green roof system under one roof, including monitoring systems, irrigation systems, drainage/retention board and substrate configurations, growth media, and planting materials. This allows clients to get all their supplies in one place, rather than having to contact multiple providers.

Envolus / *Jeanne Berlin*

Envolus is a start-up company newly created in Milwaukee to manufacture and distribute analytical kits for monitoring of bioprocesses.

The Innovation Showcase Pavilion
Tuesday, October 8

Session 434
Water Research Center at Georgia Power's Plant Bowen

Tuesday, October 8 2:45 pm – 3:00 pm
Moderator: J. Wos, Southern Research

Water management restrictions for electric generating units (EGUs) - nuclear, natural gas, coal and renewables - are expected to increase through stakeholder pressures and new regulations. In order to successfully transition EGUs into a future that limits traditional water-intake volumes and imposes new discharge limitations, Southern Research Institute and the Electric Power Research Institute (EPRI) have collaborated with Georgia Power Company (GPC) and 13 other utilities to develop a Water Research Center (WRC) focused on addressing these issues. This overview will provide a description of this exciting new center and the work they are doing.

Session 402
BlueTech® Research – Bringing Innovative Technology to Market

Tuesday, October 8 3:00 pm – 5:00 pm
Exhibit Hall Booth #367
Moderators: Paul O'Callaghan and Conor Dennehy, BlueTech Research

Key Steps in Technology Commercialization
Paul O'Callaghan and Conor Dennehy of BlueTech Research will facilitate this session on bringing new technologies into the marketplace where they can be applied full-scale. Many ideas that appear effective spring out of bench-scale research but often never make it through the commercialization process, which involves integrating many diverse resources, stakeholders and disciplines. This session will highlight the integral steps to commercializing innovative technologies.

Innovative Utilities and Early Adopters
Denny Parker from Brown and Caldwell will moderate this discussion that revolves around how these utilities developed a successful technology adoption program and will address the process of technology validation with a focus on piloting and testing. Panelists will include Sudhir Murthy, DC Water; Aik Num Puah, Singapore PUB; and Booky Oren, Booky Oren Global Water Technologies.

Common Success Factors and Innovation Hotspots
Paul O'Callaghan and Conor Dennehy will focus on key success factors common in companies that led to the validation and successful implementation of their technologies. Additionally, this presentation will cover the investment patterns for the water sector, identify the key areas of innovation, and examine how BlueTech Research tracks these innovation hotspots.

Keys to Successful Piloting and Demonstration
Jeff Moeller from WERF will discuss how the LIFT initiative brings together new technology companies with utility and industrial end users to share the risk and cost of conducting demonstrations. LIFT also focuses on accelerating the adoption of new technologies. Andy Salveson will present case studies of Carollo's involvement with two start-ups in bringing their technology to the North American market.

Bringing Innovative Technology to Market: An Overview
This third presentation by Paul O'Callaghan and Conor Dennehy will provide an overview of the BlueTech Research sessions focused around "Bringing Innovative Technology to Market."

See the article "Key Factors in Successfully Bringing Innovative Technologies to Market" highlighting this session on page 4.

Session 435
Smart Water Management: Practical Lessons From Alliance for Water Efficiency

Tuesday, October 8 3:15 pm – 5:00 pm
Moderator: Mary Ann Dickinson, Alliance for Water Efficiency

This session will explore the practical possibilities of water efficiency, from statewide policy options to onsite management strategies. Topics such as industrial and outdoor water use efficiency and leak reduction in municipal systems will be explored in this dynamic session with water efficiency experts. The speakers will give short presentations followed by an open discussion.

Myths and Trends in Water: The Latest Scoop
Mary Ann Dickinson, Alliance for Water Efficiency

Metropolitan Chicago Planning Council: Spurring Marketplace Solutions Through Water Policy Reform
Josh Ellis and Abby Crisostomo, Metropolitan Chicago Planning Council

The Benefits of Water Conservation in the World's Most Water-Rich Region
Mary Ann Dickinson and Thomas Pape, Alliance for Water Efficiency

Reception

The Johnson Foundation at Wingspread Charting New Waters Reception
Tuesday, October 8 5:00 pm – 6:00 pm

Join our innovation partners, Imagine H2O and BlueTech Research, and our sponsor, The Johnson Foundation at Wingspread, in a networking reception. Turn your curiosity about innovation into knowledge and your contacts into connections.

The Johnson Foundation at Wingspread is building upon the rich collaboration and partnership that has characterized their Charting New Waters initiative since its inception. The current phase of work is focused on catalyzing the widespread adoption of more sustainable and resilient water infrastructure systems in the United States including nutrient and energy recovery. By aiming to help local, state, and national leaders set a course for and navigate decisions regarding the conception, construction, financing, and management of water infrastructure, Charting New Waters' ultimate goal is to identify elements of a new paradigm for water infrastructure and the steps needed to transition to it.

The Johnson Foundation AT WINGSPREAD

Charting New Waters

The Innovation Showcase Pavilion
Wednesday, October 9

Innovation Showcase Program at a Glance

Wednesday, October 9 9:30 am – 3:00 pm

10:30 am 526 Operator Ingenuity Contest Winners
12:30 pm 622 Paving the Way for the Nutrient Roadmap
1:30 pm 623 Utility Energy Efficiency Case Studies Roundtable

Session 526
Operator Ingenuity Contest Winners

Wednesday, October 9 10:30 am – 12:00 pm

Innovation is a way of thinking and doing that can help you to do more with less while being more efficient. It is not limited to new companies. Innovation is found every day in utilities around the world through their operators. These plucky professionals have found solutions to challenging problems and made a difference in many ways. WEF is pleased to recognize them in this session. WEF's second annual Operator Ingenuity Contest garnered 70 entries. We are delighted to welcome some of the winners to show their great ideas. Winners include:

*Special "CSI" Award for Extraordinary Detective Work – The PARSA Potty and the PARSA Flow Bench
Bob Snyder, Steve Grosso, and Frank Kunz, Plainfield Area Regional Sewerage Authority

*Outstanding Maintenance Headache Relief – Flow Equalization Tank Problem Solver
Justin Myers, Maryland Environmental Service

*Pesky Problem Solver – Secondary Clarifier Nocardia Foam Control Solution
Alfred Waitt, Veolia Water North America

*Waste Not, Want Not – Polymer Tote Rack
Raymond Vermette, City of Dover

*Mess Prevention in Process Control – Aerated Sludge Tank Sampler
Raymond Vermette, City of Dover

*Vital Communication – Reverse 911
Don B. Wasko, City of Carlsbad

All Around Resourcefulness – Fish Finder Pipe Inspection System
Jerry W. Smith, City of Salem

Extraordinary Productivity – Septage PD Blower
Doug Sweeris, Allegan Wastewater Plant

Safety Is Job #1 – Safe Lift
Mike Lindsay , King County South Treatment Plant

**Denotes winners who will present during this session.*

Session 622
Paving the Way for the Nutrient Roadmap

Wednesday, October 9 12:30 pm – 1:30 pm
Matt Ries, Water Environment Federation
Lynn Broaddus, The Johnson Foundation

This informal session is an opportunity to provide input on the early development stages of the Nutrient Roadmap – a guide for wastewater utilities to foster sustainable nutrient management. The informal session will begin with a brief overview of why WEF is working with the Johnson Foundation and the Environmental Defense Fund to develop a Nutrient Roadmap, similar to the Energy Roadmap. Representatives from WEF and the Johnson Foundation will also outline the process of development and the overall desired outcome of this endeavor.

Session 623
Utility Energy Efficiency Case Studies Roundtable

Wednesday, October 9 1:30 pm – 3:00 pm
Moderator: Pete Cavagnaro, Johnson Controls

This interactive session will facilitate discussions with utility staff and their supporting organizations about how the utility applied energy efficiency, energy generation and performance contracting in their design, how they financed the project, and project results. Attendees will have an opportunity to ask questions of the presenters in small groups or individually. No matter where you are on your journey along the Energy Roadmap, this session will provide technical and practical case studies in an informal setting.

See the article *"Fort Worth Water Resource Recovery Facility: Turning Industrial Waste Challenges Into Energy Opportunities"* highlighting this session on page 6.

Conferences that Inspire Solutions

The U.S. faces a looming freshwater crisis that could affect the nation's economy, community livability, and ecosystem health.

The Johnson Foundation at Wingspread serves as a catalyst for change by bringing together leading thinkers and inspiring new solutions on major environmental and regional issues. In 2010, we launched Charting New Waters, an expanding network of partners from across business, agriculture, academia, environmental groups, non-profits and government dedicated to addressing U.S. freshwater challenges. Our collaborative work includes:

- Issuing Charting New Waters: A Call to Action to Address U.S. Freshwater Challenges
- Catalyzing the Adoption of More Sustainable and Resilient Water Infrastructure Systems in the United States
- Exploring New Approaches to Financing Sustainable Water Infrastructure
- Confronting Nutrient Management Issues
- Holding Regional Freshwater Forums to Identify Needs and Opportunities
- Highlighting Great Lakes Leadership on Freshwater Issues

For further information visit us at www.johnsonfdn.org

The Johnson Foundation AT WINGSPREAD

Charting New Waters

Come see us at the reception on Tuesday from 5 to 6 pm in Booth #775

We make water technology companies better.

THE WATER COUNCIL

The Water Council is a global water hub for water technology companies. We focus on synergy of those companies and the talent needed.

Our mission is to align the regional fresh water research community and water-related industries, establishing the Milwaukee region as the World Water Hub for water research as well as economic and talent development.

The Global Freshwater Seed Accelerator (www.thewateraccelerator.com) is one of world's first mentor-driven accelerators focused on startups that address global challenges in freshwater. Some of the world's best early stage water technology startups have been invited to participate in our 6-month accelerator, which is designed to accelerate commercialization of products or services by providing a network of mentors, investors, and an entrepreneurial training program. Each startup will receive a grant of $50,000 and placement in the state-of-the-art Global Water Center.

For further information visit us at www.thewatercouncil.com

Come check out Session 433: Global Freshwater Seed Accelerator Winners on Tuesday, October 8 from 1:45 pm to 2:45 pm in the Innovation Pavilion Theater.

Innovation Pavilion Exhibitors

Imagine H2O
A WEF Innovation Partner, Imagine H2O is a nonprofit organization with a mission to inspire and empower people to solve water problems. The company's vision is to turn water challenges into opportunities. It's staff host business plan competitions and an accelerator program to help competing entrepreneurs turn their plans into transformational solutions.

BlueTech® Research
A WEF Innovation Partner, BlueTech Research is an independent market intelligence firm, focusing on the water technology industry. BlueTech Research analyzes what is changing and how new approaches, technologies, and needs are reshaping the water technology market. BlueTech Research Advisory Service supports its client's competitive and market strategies through its suite of intelligence products and services.

Bill & Melinda Gates Foundation
Guided by the belief that every life has equal value, the Bill & Melinda Gates Foundation works to help all people lead healthy, productive lives. The Foundation's Water, Sanitation and Hygiene goal is to enable universal access to sustainable sanitation services by supporting the development of radically new sanitation technologies as well as markets for new sanitation products and services.
Visit Booth #1080

Bilexys
An Imagine H2O winner, Bilexys' technology converts wastewater to industrial chemicals through bioelectrochemical treatment.

Crystal IS
Winner of the 2013 BlueTech Forum Disrupt-o-Meter™ Award, Crystal IS offers UVC LED disinfection technology for monitoring, purification and sterilization applications in the water, food, air and healthcare sectors.

Design Outreach
Design Outreach (DO) is a nonprofit charity organization seeking to alleviate poverty by designing, manufacturing, and delivering scalable and sustainable technology. DO's current project is the LIFEPUMPTM total water solution, which began in the Central African Republic. Visit Booth #1277.

Hydration Technology Innovations (HTI)
Winner of the 2011 BlueTech Forum Disrupt-o-Meter™ Award, HTI's HydroPack uses a high performance, forward osmosis membrane that filters contaminated water into clean drinking water.

NGen Corporation
An Imagine H2O winner, NGen's process removes and recovers energy from nitrogen in wastewater by converting ammonia to nitrous oxide gas, then burning biogas with the nitrous oxide to increase power output.

NLine Energy
An Imagine H2O winner, NLine's products convert wasted energy found in fluid and gas transmission and distribution systems into renewable energy that creates a new power and revenue source for multiple industries.

Optimatics
Optimatics provides the water industry's most powerful water planning decision support tools and processes to enable optimal water services. Optimatics enables decision makers to optimize the planning, operations and management of their water and wastewater networks with distributed computing solutions. Visit Booth #1278

Pasteurization Technology Group (PTG)
Winner of the 2011 BlueTech Forum BlueTruffle™ Award, PTG channels typically wasted exhaust heat from a turbine or engine to disinfect wastewater and deliver an energy-efficient and low-cost solution.

PaveDrain
An Imagine H2O winner, PaveDrain manufactures a premier permeable paving surface with the highest infiltration rates, highest structural loading, and lowest maintenance.

Voltea
Winner of the 2013 BlueTech Forum BlueTruffle™ Award, Voltea offers a capacitive deionization technology (CapDI) that removes ions from water using electricity at a low economic and environmental cost.

Kore Infrastructure
KORE Infrastructure, LLC uses a thermo-chemical process to convert biosolids into market-ready, drop-in, No. 2 diesel fuel. KORE won the 2012 EPA Green Chemistry award. Visit Booth #1276.

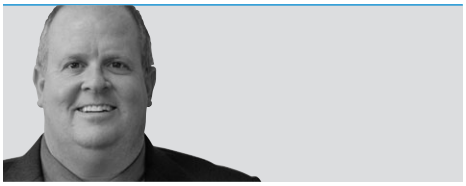
ZAPS Technologies
ZAPS Technologies, Inc. produces online, real-time, water quality monitoring. They apply patented and proprietary solid-state optical techniques requiring no chemicals, reagents, operators or routine maintenance. Visit Booth #1275.

Meet the Innovation Experts

One of the Water Environment Federation's objectives is to drive innovation. WEF aims to inspire and champion innovation in the water sector and to seek holistic approaches to water management that include a focus on recovering and reusing resources rather than simply managing waste.

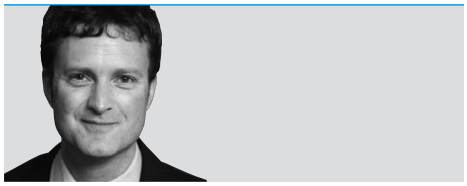
Barry Liner leads the Water Environment Federation's innovation initiatives. The Innovation Showcase Pavilion at WEFTEC® is a large part of this initiative, and WEF's innovation partners, BlueTech® Research and Imagine H2O, are integral to this effort. These companies not only provide related technical programming but also invite their innovation-award winners to exhibit in the innovation pavilion.

Meet the leaders of these efforts...



Barry Liner
Director, Water Environment Federation

Barry Liner, Ph.D., P.E., is Director of The Water Environment Federation's Water Science & Engineering Center and leads WEF's energy and innovation initiatives. With over 20 years of experience in the water, IT, and energy sectors, Barry helps provide performance improvement and sustainable solutions to both private and public entities in the US, Canada, Mexico, and Peru. He has worked for Black & Veatch, The World Bank, and other consulting firms supporting dozens of water and wastewater utilities, U.S. EPA, and the Water Environment Research Foundation. Prior to joining WEF, Barry served as a professor of Sustainable Water Resources and Director of Engineers for International Development at George Mason University. He earned his doctorate in Sustainable Water Resources and also holds degrees in Environmental Systems Engineering, Economics, and Business Administration.



Paul O'Callaghan
CEO, O2 Environmental

Paul O'Callaghan is the founding CEO of O2 Environmental, the leading Clean Tech consultancy providing water technology market expertise to support the commercialization of innovative water technologies.

Paul is also CEO of BlueTech Research, a subsidiary company of O2 Environmental. The BlueTech Research Advisory Service provides clients with expert insight and analysis on industry drivers and trends, helping them to effectively navigate their way through a changing and evolving water technology market and make informed decisions.

Paul holds a Master's Degree in Water Resource Management and has 16 years of experience in the water industry. He is the author of numerous papers on water and wastewater treatment, has lectured at Kwantlen University College and has been an invited lecturer at Harvard Business School. Paul has been chair of a technical committee on decentralized wastewater management in British Columbia, has been a Director with Ionic Water Technologies and is an industry expert reviewer for Sustainable Development Technology Canada.

Scott Bryan
Chief Operating Officer, Imagine H2O

Scott Bryan is the COO of Imagine H2O, a nonprofit that inspires and empowers people to turn water challenges into opportunities. Prior to joining Imagine H2O, Scott was a Financial Consultant at Royal Bank of Canada where he specialized in sustainable investment strategies for foundations and private investors. Prior to RBC, Scott was a Social Investment Analyst at Piper Jaffray where he assessed environmental, social and governance (ESG) factors in the investment process. Scott originally became involved in Imagine H2O as a volunteer via his membership in Full Circle Fund's Energy and Environment Circle. Scott currently serves on the board of Vida Verde Nature Education in Half Moon Bay. He has a BA in Economics from Colorado College.

WEF INNOVATION PARTNER

IMAGINE H$_2$O

Visit the WEFTEC Innovation Showcase

Meet winning companies identified by Imagine H2O's Business Innovations Program

weftec the water quality event

innovation showcase

Join the Leading Ecosystem for Water Entrepreneurship & Innovation

Imagine H2O is a nonprofit organization that inspires and empowers people to turn water challenges into opportunities

www.ImagineH2O.org

@ImagineH2O

INNOVATION SHOWCASE

Innovation shifts our business-as-usual thinking to something different and better. The WEFTEC Innovation Showcase highlights innovation in the water industry and brings together utility leaders, investors, strategic partners, and entrepreneurs who want access to award-winning technology companies, high-level networking, and original programming.

At this year's Showcase, brought to you by WEF and innovation partnersBlueTech Research and Imagine H2O, you can:

- See innovative and disruptive water technologies and companies that have transformed ideas into solutions
- Network at receptions and in the Pavilion with water industry leaders who make innovation happen
- Learn technology commercialization strategies and how to integrate diverse resources, stakeholders and disciplines
- Benefit from dynamic thinking and conversations that can lead to new business and market scale-up