

Innovating for Water's Future

A roundtable discussion hosted by the U.S. Water Alliance and the Water and Wastewater Equipment Manufacturers Association

**March 4, 2013
Washington, D.C.**

PURPOSE AND OVERVIEW

The U.S. Water Alliance (USWA) and the Water and Wastewater Equipment Manufacturers Association (WWEMA) convened this roundtable discussion to bring together key policy makers, regulators, manufacturers, industry leaders and others to discuss ways to promote the development and adoption of innovative approaches and technologies within the water industry. This report offers a summary of the discussion.

NOTE: Event organizers elected to employ a modified version of Chatham House Rules, so remarks are reported without attribution. Contributing panelists included the following:

Deb LaVelle, Chair, Water and Wastewater Equipment Manufacturers Association
Rich Anderson, Senior Advisor, U.S. Conference of Mayors
Robert Steidel, Director of Public Utilities, City of Richmond
Suzanne van Drunick, Office of Research and Development, Headquarters, U.S. EPA
Sally Gutierrez, Office of Research and Development, Cincinnati, U.S. EPA
Alex Dunn, Executive Director and General Counsel, Association of Clean Water Administrators
Jim Taft, Executive Director, Association of State Drinking Water Administrators
Nancy Stoner, Acting Assistant Administrator, Office of Water, U.S. EPA

Facilitators included:

Benjamin Grumbles, President, U.S. Water Alliance
Dawn Kristof Champney, President, WWEMA
Brent Fewell, Chair, Business Advisory Council, U.S. Water Alliance, Sr. VP, United Water

CHALLENGES AND BARRIERS TO INNOVATION

The manufacturers' perspective. The discussion began with a look at barriers to innovation from the point of view of water and wastewater equipment manufacturers. "Innovation" was defined by this segment as technology that is not yet proven but that has the potential to offer some cost, performance or environmental benefit. A representative of the water and wastewater equipment manufacturers industry indicated that manufacturers are willing to make investments in innovation, but that they encounter several barriers to bringing those technologies to market. According to a recent survey of manufacturers conducted by the Water and Wastewater Equipment Manufacturers Association, the top five barriers are:

1. ***The risk-averse nature of the industry.*** From the federal government through the states, through consulting engineers and municipalities, there is a natural aversion to risk because of the duty to protect their constituencies. Manufacturers themselves can be risk-averse because they need to protect the profitability of their businesses.

2. ***The low cost of water.*** Resistance to charging full cost of service rates is undermining municipalities' ability to invest in technology innovations.
3. ***Procurement methods based on low cost rather than lowest lifecycle cost.*** Short-term gains come at the expense of long-term savings.
4. ***Permitting and new technology validation requirements.*** Without agreement on interstate standards and reciprocity, it can require 50 state decisions to bring a technology to market.
5. ***“Buy American” legislation.*** Such trade-restrictive requirements can cause manufacturers to shy away from development of new technologies as they rely on global supply chains.

The local government perspective. The discussion next turned to the barriers to innovation from the standpoint of municipalities. Municipalities, which represent the largest buyer of water infrastructure and technology, currently spend a great deal on water, and those expenditures increase each year. Between 2001 and 2010, local governments spent \$86.4 billion on public water (including both capital expenditures and operations/maintenance), or \$111.4 billion annually. Increases in public spending on water have significantly outpaced U.S. GDP and inflation. This is not sustainable.

Exacerbating the problems for municipalities are: inflation; population growth and expansion; uncertainty about the economy; and the possibility of a cap being placed on tax-exempt bond financing. For the most part, these factors are out of the control of cities and counties.

One problem municipalities face that is, to some extent, within their control to change is the widespread use of outdated procurement methods. The U.S. Conference of Mayors is currently developing a set of white papers on how and why procurement policies and practices need to be updated to better address the issue of smarter, more sustainable growth.

In general, while municipalities may not be the entities that will resolve many of the impediments to innovation, they are prepared to document the demand for it. Local governments have a strong interest in reducing their spending by using technologies that will help reduce energy costs and, simultaneously, meet more stringent regulatory obligations, e.g., better nutrient management.

In addition to many of the funding issues previously addressed, utility directors face the challenge of upgrading their facilities without disrupting the community and their own operations. The community wants public works to be “invisible,” objecting to construction issues such as road closings and noise. Another challenge for some is the size limitation of their plant. Dismantling, construction and installation of new technologies without interruption of critical services within a restricted area can be extremely difficult. The construction costs for these projects can be significant, upwards of 80cents on the dollar – constructability is a major hurdle.

OPPORTUNITIES AND SOLUTIONS

The manufacturers' perspective. From the equipment manufacturers' perspective, referring to the WWEMA survey, the top five ways for promoting the development and adoption of new technologies were:

1. ***Employ full-cost pricing of water.*** Passing the true cost of water onto rate payers is the best way to ensure sustainable services and take the burden off of already strapped municipalities.

2. **Using “value based” (rather than “or equal”) procurement procedures.** Innovation by its very nature suggests no existing equal; thus public procurement rules accommodate status quo over competition.
3. **Address permitting and validation requirements.** Both at the federal and state levels, variances need to be created that will allow for more innovation and make permitting and the technology validation easier for municipalities and technology providers.
4. **Establish a federal guarantee program for technology replacement.** For example, develop some type of insurance program whereby a technology that does not perform as intended can be remedied or replaced. Develop a federal guarantee program for municipalities that move forward with innovation, ensuring that there is some remedy identified if technology does not work – e.g., insurance ... pay a premium to insure.
5. **Prioritize low total cost of ownership in the selection of technologies.** Broaden specifications from low initial price to include life-cycle costs, environmental costs and other factors.

Among the manufacturing community’s least recommended solutions were:

1. **Federal/state financial assistance.** There is money out there, but for private entities to invest capital in developing innovative technology, there needs to be clear, defined rules and regulations to ensure it will be approved and there needs to be reciprocity among states.
2. **Added skill-based education.** Lack of skills was not deemed to be among the key factors preventing innovation.
3. **Added permitting/approvals from regional centers.** Though well intended, the proliferation of regional water technology centers could potentially add another layer of cost of doing business for manufacturers that sell nationally.

The federal regulators’ perspective. Federal regulators also offered their perspective on opportunities and solutions for encouraging new technologies. This is a priority for the U.S. government, they said, not only because of the potential implications for public health and the environment, but also because the development of such new technologies is good for U.S. exports and helps to maintain the nation’s trade surplus.

On the other hand, environmental regulators are constrained in their ability to support and conduct research in that their research has to be purpose-driven; they do not have the academic freedom to conduct research for its own sake.

To that end, the following portfolio of needs and priorities was identified relative to the EPA Office of Water:

- watershed management
- emerging contaminants
- next-generation water/wastewater treatment, especially for small systems
- wet weather management using green technologies
- domestic energy production
- hydraulic fracturing
- energy reduction/recovery from wastewater
- infrastructure needs
- water reuse

- improved, less costly monitoring
- nutrients management
- sustainability/resiliency
- technical assessment and verification
- public education

The regulators indicated that while all of these needs are important, they need help determining which five or six areas they can focus on to make real progress.

The regulators offered some examples of innovation the federal government has developed and/or recognized through awards programs, including a smart phone application with a sensor that provides real-time water quality data; the SWIM, a storm water data calculator; and a pipe leak-detection product currently in use as a pilot program by the Department of Defense.

One way the federal government supports innovation is through the EPA Office of Research & Development's recently formed water technology and innovation clusters. There are 10-11 such clusters currently operating throughout the United States, each with different priorities related to water, such as jobs, agriculture, economy, etc. (http://www.epa.gov/nrmrl/watercluster/strat_collaborations.html)

The clusters call for networks to be established among universities; private companies; government at all levels; and support groups such as investors and economic development agencies. The intent is to seek common goals, to leverage research and development efforts, and to encourage innovation and the development of improved technologies and systems. The purpose of the clusters is not to serve as another regulatory layer nor serve as a technology validator, but rather to facilitate and foster water technology and innovation.

The United States is not the only country taking this approach; the governments of Israel, Singapore, and Canada also have formed these types of water R&D incubators.

The state regulators' perspective. State regulators are fundamentally supportive of innovative technologies, as they are interested in improving water quality and growing the economy. At the same time, they are admittedly risk-averse as their positions are not structured in such a way that risk-taking is rewarded.

State regulators can be persuaded to champion the development and adoption of innovative solutions if the proposed new technologies:

- offer improved environmental outcomes
- offer incidental benefits, such as improved air quality or solid waste management
- can lower costs
- provide a non-discharge or reduced-discharge alternative
- offer environmental justice benefits (i.e., benefits to low-income communities)
- are a proven fit (e.g., within the climate, soil conditions, etc.)
- are presented with compelling results (e.g., upstream/downstream water quality data)
- are appropriate for the application – must be a “good fit” – not just in terms of effectiveness but also in terms of operation, maintenance, etc.
- include terms in which the risk of adoption will be offset by a reliable and realistic fallback option if they don't work (i.e., a Plan B that the company will stand behind thereby reducing the risk of failure)

Conversely, regulators will be less likely to consider new technologies that:

- have crashed before
- require highly trained staff (in which case there is a concern as to whether the state has the resources necessary to provide adequate oversight)
- put a strain on an already burdened system (e.g., in terms of staff workload and capabilities)
- do not include a fallback plan
- result in states getting “stuck” with the problem due to failure
- are not permitted by state regulations
- are clearly not allowed by regulation
- require site-specific data where such data has not been developed or provided (need to show transferability of technology through pilots and different complexity and size and differences in regional factors, e.g., soils, weather, pipes, etc.)
- meet community resistance

Technology providers and innovators must do their homework before asking state regulators to approve innovative approaches. Regulators also believe that it is not the regulations themselves that impede innovation but the policies, i.e., the way the regulations are applied, that is the problem. They recognize that there needs to be an improved communication network among states and with the water community to address these issues. Reciprocity is important, and states need to continue to work to get all state issues and questions on the table.

Finally, regulators are interested in exploring third-party certification, e.g., environmental technical verification, to help eliminate the lack of coordination in permitting.

FACILITATED DISCUSSION

The final session of the event was a facilitated discussion among all roundtable participants in which they voiced their thoughts on what had been discussed and provided additional perspectives. Among the opinions expressed:

Several manufacturers echoed the earlier sentiments regarding the difficulty in bringing technologies to market due to the inconsistent permitting requirements from state to state, thus creating barriers to entry and forcing many of the technologies to be developed and implemented overseas. They advocated for more reciprocity and went a step further, calling for international standards as many of them have successfully proven technologies in the overseas market.

A number of manufacturers in attendance also reinforced the difficulty of overcoming the hurdles presented by “low bid” and “or equal” procurement practices. They advocated for governments to adopt value-based procurement policies and to place the onus of making such purchase decisions on the owner/engineer rather than on the contractor.

Several manufacturers expressed the opinion that innovation will never come from the government but will come from the technology providers and from market demand, but that the government needs to help reduce the risk to communities so that these products can be launched. Examples of risk-reduction options include insurance programs and federal funding programs in which technologies can be replaced if they do not work. In addition, there would need to be some assurance that the regulators would not penalize/fine the community while it is correcting the problem.

An increase in certainty with regard to regulations, permitting, etc., also would help companies in securing up-front private funding for R&D and technology development as investors are reluctant to provide capital when there is too much uncertainty.

Small manufacturers are particularly vulnerable and in particular need of an easier path to market because they cannot afford to wait five years for product approvals to start seeing profits.

A utility representative offered his recommendation that public works departments include staff training in their budgets (e.g., 3 percent of total budget) as a best practice to ensure that staff can handle new technologies as they are introduced.

A state regulatory representative advised that those who are interested in providing new technologies to the states are more likely to have success in doing so if they target projects that do not fall under federally regulated programs. States are less willing to take risks and face the potential penalties that come with those programs.

A representative of the conservation community suggested that water industry professionals need to coordinate with other sectors. For example, agriculture is working to develop highly cost-effective ways to reduce nutrients. More cross communication is needed.

A municipal representative expressed the desire for states to do a better job of collecting performance statistics and comparison data and disseminating that information to the localities. A program being sponsored by the Water Environment Research Foundation is bringing municipal and industrial facility owners together to identify priority needs and technology options to be vetted through a peer-review process.

Finally, the federal regulators indicated they are open to the ideas expressed and believe they could have a role to play regarding: exploring a potential risk insurance program (though they would need to partner with other agencies to secure the needed funding); providing more certainty with regard to regulatory schedules and enforcement; working with states and localities to offer greater flexibility regarding enforcement in cases where innovation has the potential to result in improved performance; supporting small businesses; and establishing more cooperation among interested parties (i.e., via the regional cluster program).