

**SESSION TITLE:**

H2O-ptimize: What policies and programs are needed to improve the efficiency of water infrastructure and optimize functionality across sectors?

SPEAKER SUMMARIES:

Betsy Otto, Aqueduct Director, World Resources Institute

- Water scarcity is a very big issue in the developing and the developed world, with threats ranging from the 667 million people in India going without power for two days last year because of drought and extending to the San Joaquin Basin in California where snowpack levels are vital to power production. The World Resources Institute's Aqueduct Project maps the water risks and opportunities for companies, investors, governments and other users.

Dr. Holmes Hummell, Senior Advisor, Office of the Undersecretary for Energy, U.S. Department of Energy

- The Department of Energy has more than 20 programs that address the energy-water nexus, and half of the water withdrawals in the United States are for thermal-electric power plants. With 12% of the energy that the country uses going to the delivery of water, we should guide energy policy to conserve water and the water supply chain to conserve energy.

Kelly Kryc, Water and Power Advisor, Bureau of Energy Resources, U.S. Department of State

- The Bureau of Energy Resources is a fairly new addition to the Department of State, but it reflects the agency's commitment to three goals: 1) reducing water demand, 2) increasing the water supply and 3) producing energy from water. The Department of states is working at the national, regional and international levels to promote integrated water resources management, and to recognize water's role in economic development, basic sanitation and human health.

Dr. Lilia Abron, Founder and President, PEER Consultants

- We must approach our solutions to the energy and water problems facing us in a holistic manner that is also sustainable. In order to solve the problems caused by the water scarcity and energy demand with finality, we must embrace major behavioral changes about how we operate.

SESSION WRAP-UP*Behavior*

One of the themes throughout the session was the role of behavioral changes in addressing problems related to the energy-water nexus. Beginning with Dr. Abron's remarks that our appliances do not require the quality or quantity of water that we are accustomed to for effective operation, the discussion moved to what has worked in other countries. For example, Australia has had great success with a water reclamation program that has greatly reduced water usage. Dr. Abron also spoke of a program in South Africa that is installing low-flow showerheads in Cape Town. Although this program was initially intended to reduce the intensity of water usage, it ended up also reducing energy consumption by 40 MW within a 4-month period.

Domestically, Dr. Hummell pointed out that the US government has responded to the long-term nature of the water scarcity problem with a preparedness directive from the President, which provides a roadmap for federal engagement with stakeholders on water issues. Community resiliency and planning is another area in which the federal government envisions that it can create a platform to work with local groups and decision-makers to alter



people's behavior towards long-term success. Another area where the federal government can subtly change the behavior towards water usage is in building codes. Betsy Otto noted that the current pipe size for our water infrastructure is completely unnecessary and based on antiquated legislation. By simply reducing the size of pipes, local governments could encourage people to use less water, less electricity, and lower costs for electric and water utilities –a win-win-win.

Lastly, there is the issue of design controls by manufacturers for pumps, which could result in better water conservation behavior on the front end. Dr. Abron remarked that the DC Sustainable Energy Utility provides technical assistance on retrofits specifically with this goal in mind. Kelly Kryc also noted that improved pumps are an existing technology that isn't limited to applications in developed countries like the US. In fact, 20% of the water used is wasted in pumps, and they could be implemented globally to improve water and energy efficiency.

Utilities/Government

One issue facing the establishment of more efficacious programs that integrate energy and water efficiency policies are institutional barriers. In order to respond to this, the government must find a way to integrate the planning functions in order to find complementary objectives for both the energy and water sector. Dr. Hummell commented on the City of Gresham in Oregon, which is one example of a wastewater treatment plant that wastes no water at all. This plant is part of an overall climate policy, which recognizes the connection between energy usage and water. Within the US government, the Department of Defense has begun pilot installations of Net Zero facilities. The goal of this program is to have production facilities that produce as much energy on site as they use over the course of a year. It is a good start towards creating more comprehensive policies.

Some water utilities are beginning to change their policies in order to plan for the future. Dr. Abron noted the rising popularity of best management practices to collect wastewater in DC and Maryland. However, Betsy Otto pointed out that the majority of water utilities view themselves as volume businesses and don't manage water use at all.

Financing/Funding

Naturally, part of the discussion about improving policy and behavior entailed a discussion about how to fund the behavioral change measures in communities and electric utilities. In a lot of cities, problem is that they don't have the funding to get from point A to point B in the area of water reclamation. Dr. Abron's pointed out that local water utilities can collect rates to finance projects, but this is only effective if they can convince people that they're trying to get costs under control. However, the key factor is that when the power to collect rates exists, there is a duty to use this power in the way that is most efficient. Raising rates to finance water efficiency projects will make communities less vulnerable to the dangers of water scarcity, and is consistent with this maxim.

Dr. Hummell also spoke briefly of the Rural Utility Service, which as a credit line to offer low rates for water infrastructure projects. There was about \$3 billion available in 2012, but only \$1.5 million was actually used.



Following the recovery from Hurricane Sandy, there have been efforts to leverage financing from the private sector.

Other

Lastly, the discussion touched briefly on innovation within the field of energy efficiency. There have been comparatively few patents filed in the last 40 years, which reflects stagnation in development. Dr. Hummell remarked that the Energy Technology Portal contains a large number of patents for small businesses to utilize, and ARPA-E has a number of programs that continue to develop water innovation projects.

ACTION ITEMS & TAKEAWAYS

- Energy and water are completely independent resources, and plans for increased sustainability of one must contain plans for the other