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The U.S. Environmental Protection Agency identifies two general categories for practices designed to increase water efficiency: engineering and behavioral. Engineering practices involve technologies designed to passively reduce water irrespective of the user's behavior (e.g., low-flow showerheads). Behavioral practices refer to changing users' habits irrespective of the technology being used (e.g. fewer showers). This binary focus overlooks the conceptual area where technology and behavior influence each other (e.g. showerheads that encourage shorter showers through user feedback)—an area that has seen less attention, and is ripe for development. We present findings and lessons learned from a workshop on "Saving Water Through Behavior Changing Technologies" sponsored by the Building Technologies Office of the U.S. Department of Energy and hosted by Argonne National Laboratory. The workshop convened experts in water efficiency, behavioral sciences, design, engineering and other fields, along with commercial developers and others who might significantly contribute to the design, development and dissemination of behavior-impacting technologies that reduce water consumption for buildings. This paper will provide key findings from the workshop: technological and institutional barriers to achieving greater water efficiency, characteristics of technologies that are desirable for affecting behavioral change, lessons learned from existing technologies, and current challenges and opportunities facing water utility efficiency programs (compared and contrasted with the experiences of the electric sector). We will propose several research pathways that may support the development of promising new technologies with potential to influence consumer behavior and reduce water consumption in the residential and commercial sectors.