



From the journal:  
**Energy & Environmental Science**

## Desalination for a circular water economy†



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### Abstract

Today's water systems are enabled by ample fresh water sources, low-cost centralized treatment, and facile wastewater disposal. Climatic change, aging infrastructure, and source water contamination have exposed the vulnerabilities of this linear water paradigm. While seawater desalination enables coastal communities to augment their supply, more broadly securing water systems for municipal, industrial, and agricultural water users will require distributed desalination and fit-for-purpose reuse of nontraditional water sources. Our linear water economy must evolve into a resilient circular water economy, where water is continuously reused and “contaminants” become the feedstocks for other economically valuable processes. Technology innovation is needed to deliver autonomous, precise, resilient, intensified, modular, and electrified desalination systems that reduce the cost, improve the performance, and enhance the resilience of nontraditional water reuse systems. Meanwhile, strong federal leadership and coordination is needed to accelerate desalination research, promote information gathering efforts to direct technology development, and create an expanded role for non-profit organizations in knowledge dissemination.

