

Could water utilities transform the way the electric sector did?

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A mix of government incentives and regulations revamped the electricity sector. Could a similar approach work for water? Credit: Stocksy/Paul Edmondson

Water utilities nationwide are grappling with aging infrastructure, environmental degradation and climate change.

Existing [water systems](#) are also highly centralized and supported by old-fashioned financing models. But what if instead of simply replacing the physical infrastructure and financing mechanisms, the sector reinvented them?

That was the approach California took to its electricity sector in recent decades, a success story that could be adapted to the [water](#) industry, according to a paper in *Environmental Management*. In the paper, Newsha Ajami, director of urban water policy at Stanford's Water in the West program, and her Stanford colleagues outlined four key elements to a potential plan.

Step one: Water sector leaders must recognize that regulations and market drivers are essential to catalyzing change. For example, electricity utilities in California incorporated renewable energy sources into their systems mainly because regulations required them to do so, and while they were meeting these mandates, technology costs gradually decreased. The researchers see similar potential in the water sector, for example, if policies are enacted that require [water utilities](#) to diversify water supply systems or achieve certain water efficiency levels.

Second, they say, water utilities must expand beyond traditional funding sources and rely on a diverse set of public and private funds to implement non-conventional water solutions. As part of this, policymakers and regulators must emulate the electricity sector's path, enacting policies that enable utilities to fund and finance projects in new ways. This approach could be adapted to the water sector through measures such as stormwater fee programs, tax credits or so-called green bonds, which are specifically earmarked for environmental and climate-related projects.

Third, policymakers, regulators and decision makers must create pathways that enable cost-sharing or eliminate upfront costs in order to help see projects through. Study co-author Kim Quesnel, a graduate student in civil and environmental engineering, says this kind of thinking might encourage, for instance, the spread of graywater recycling systems. In such systems, a house, apartment building or office complex might channel all non-toilet wastewater—from sinks, showers and

washing machines—back into some second on-site use, such as flushing water for toilets or irrigation for landscaping. Quesnel suggested that water providers could install such retrofits or upgrades in advance and recoup the cost by amortizing it over time on the monthly bill. This approach—called on-bill financing—is a decentralized way to encourage water reuse and has been used successfully in the electric utility world for residential solar panel installations.

The fourth element of the framework concerns improving the governance of [water projects](#). Developing and implementing distributed water systems doesn't just require money. New management strategies and a more diverse set of public and private actors are needed. One example is to bundle projects and pool funding sources, to decrease risk, improve management and give smaller projects better access to affordable financing while engaging a broader set of funders—a strategy successfully pursued in the electricity sector.

Public benefit funds

A related study, published in the *Journal of the American Water Works Association*, focuses on public benefit funds, a financing mechanism used in the electricity sector that Quesnel and Ajami see as particularly well suited for the water sector.

Under this model, utilities added a use-based surcharge that usually worked out to \$1 to \$2 a month to ratepayers' electricity bills. The additional revenue went into a public benefit fund used for grants, loans, rebates and tax credits that encouraged energy efficiency and renewable energy production, such as by helping people buy and install solar panels. Some resources also went toward research, development and the funding of pilot-scale demonstration projects. In the water sector, Quesnel says, public benefit funds could be set aside for conservation and efficiency, green infrastructure, wastewater reuse projects and other efforts that

modernize infrastructure, improve performance and increase innovation.

Lessons for the water sector

Ajami and Quesnel are part of a National Science Foundation engineering research center called ReNUWIt, short for Reinventing the Nation's Urban Water Infrastructure. To highlight the ideas and tools from their framework, they use an [interactive map](#) to present real-world examples of such innovations in the [water sector](#). They see the map as a tool to expose leaders in different parts of the country to new ways to finance, govern and implement water projects.

"Over time this tool can help to change conventional ways of doing things and spur a transformation of America's aging water systems," Ajami said.

More information: Kimberly J. Quesnel et al. Accelerating the Integration of Distributed Water Solutions: A Conceptual Financing Model from the Electricity Sector, *Environmental Management* (2017). [DOI: 10.1007/s00267-017-0914-4](https://doi.org/10.1007/s00267-017-0914-4)

Kimberly J. Quesnel et al. Advancing Water Innovation Through Public Benefit Funds: Examining California's Approach for Electricity, *Journal - American Water Works Association* (2017). [DOI: 10.5942/jawwa.2018.110.0009](https://doi.org/10.5942/jawwa.2018.110.0009)

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