



Charles River Watershed Association releases new proposal

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The Charles River Watershed Association recently proposed a new way to manage water that would provide some relief for local budgets and enhance the local environment.

In a publication titled “Transformation: Water Infrastructure for A Sustainable Future,” the environmental organization calls for the adoption of small local water treatment and energy generating centers that would work to lead to the phasing out of large-scale treatment plants like the Deer Island Wastewater Treatment Facility.

CRWA’s new paradigm treats waste as a resource and takes its cues from nature on the best ways to manage water. CRWA proposes Community Water and Energy Resource Centers, locally-based energy generation and water recycling facilities that combine existing technologies to capture the resources available in wastewater and other organic waste and use them to produce energy, nutrients and clean water. CRWA, a team of technical professionals and local advisors developed conceptual designs for CWERCs in two Boston neighborhoods. The team’s financial analysis concluded that under certain scenarios CWERCs can be self-sustaining by selling the water, electricity, heat and fertilizer generated at the facility without charging fees for sewage treatment.

“The antiquated water systems on which we depend are incompatible with nature and represent significant costs and risks to society as they age and as the climate changes,” said CRWA Executive Director Robert Zimmerman. “We can engineer our way out of this box because the economics of CWERCs are so compelling, but we must start now.”

The American Society of Civil Engineers 2017 Infrastructure Report Card grades the nation's water systems and inland water resources at a D. Repairing all of the country's crumbling infrastructure is estimated to cost roughly \$3.6 trillion.

"Even if we had the money, repairing our existing systems is an investment in the past," Zimmerman said. "It is time to invest in solutions that are financially, socially and environmentally sustainable. To prepare us for the coming century, we need infrastructure that is adaptable, resilient and does not drain dwindling government budgets."

CWERCs reject the traditional treatment plant philosophy of "waste" water. At present, approximately 300 million gallons of water are discarded daily into the Massachusetts Bay by the Deer Island plant alone. CWERCs combine a membrane bioreactor, thermal energy heat pump, anaerobic digester, composter and other technologies to treat water locally, generate energy and reuse the clean fresh water produced including returning a portion back to the environment to replicate natural water, carbon and nutrient cycles.

Treated water would be sold for appropriate uses, reducing demand on local drinking water sources. In the conceptual designs, the two CWERCs could each sell up to 2 million gallons of water per day, approximately four Olympic swimming pools worth, reducing demand on freshwater sources. Other products produced by CWERCs include electricity, thermal heating and cooling, and fertilizer from food waste.

Beyond economic and practical considerations, one of the proposed benefits of adopting CWERCs would be to benefit wildlife, the environment and river ecosystems like the Charles. A key element of CRWA's proposal includes using a portion of the recycled water to "green" the neighborhood surrounding a CWERC with reclaimed streams, reconstructed wetlands, rain gardens and other environmental improvements to restore the natural water cycle. As part of the project, CRWA designed green infrastructure plans for the neighborhood surrounding each CWERC.

CRWA began researching alternative water infrastructure to address chronic low flows impacting the Charles River and aquatic wildlife nearly two decades ago. High demand for drinking water, developed and paved surfaces, along with water loss into wastewater pipes all deplete critical groundwater supplies which

ultimately results in diminished flows in rivers including the Charles. Climate change not only exacerbates these problems, but also threatens to stress existing water management systems with extreme storms and rising sea levels. CWERCs and associated green infrastructure provide a solution to many of these challenges.

CRWA is actively pursuing CWERC pilot projects in Massachusetts and cities across the country. The town of Littleton is currently in the early planning stages for the first CWERC in the country. CRWA seeks partnerships with community organizations, municipalities, investors, developers and others interested in building a CWERC.

CRWA's report reflects three years of research with technical assistance provided by Natural Systems Utilities based in Hillsborough Township, New Jersey. Economic analysis was performed by Industrial Economics of Cambridge. This work was funded by the Rosin Fund of The Scherman Foundation and the Eaglemere Foundation.

A summary of the research and the full report is available at

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