

The 2016 MIT Water Summit convened a group of water experts from diverse fields to discuss how MIT can become a global leader in the treatment, re-use, and management of wastewater. The recommendations made to MIT during this discussion are presented in this executive summary.

### Why should MIT be a leader in wastewater management?

Management and treatment of wastewater is critically important around the world. A volume of over 330 km<sup>3</sup> (~ 2/3 of the Mississippi river's annual flow) is produced by municipalities, agriculture, and industry every year, much of which is discharged into waterways with inadequate or no treatment at all<sup>1</sup>. This should change: not only must effluent water be dealt with in a socially equitable and environmentally sustainable manner, in many cases wastewater also contains lost resources and energy, presenting untapped economic value which could be generated using new technologies and strategies.

### Wastewater: part of “One Water”

Wastewater must be considered not as an isolated waste stream, but instead as an integral part of the larger cycle of water collection, use, treatment, and re-use. Water is the single largest volume good transported within cities today, and water is the component of the food-water-energy nexus directly impacted by pollution and climate change. As a primary link in this “One Water” cycle, wastewater should be an area of focus at MIT, because the solutions to tomorrow's water problems will require a holistic view of the entire water cycle.

### How can MIT take a leading role?

MIT should strive to offer global leadership in the field of One Water by defining research priorities, developing required technologies, and training the next generation of water professionals. It is recommended that this is done via the following actions:

- *Work with both local and international partners to encourage knowledge exchange and collaboration:* Collaboration with utilities, government, universities, and industry benefits all parties involved. Locally, good candidates for this type of collaboration are the Massachusetts Water Resources Authority, Boston Water and Sewer Commission, and Massachusetts Clean Energy Center, among others. However, water challenges facing the rest of the world are different from those facing New England. MIT should continue to engage on water issues with institutes around the world, seeking to focus research questions and open a pipeline for student internships.
- *Foster the next generation of water professionals:* Research and internship programs with water companies and utilities will prepare undergraduate and graduate students to enter the field and help bring new ideas to the industry, as well as transfer knowledge from today's water professionals, who have an average age of over 50.
- *Utilize the MIT campus to test, develop and showcase new water technologies.* Water reclamation and energy harvesting can eventually be implemented in MIT's day-to-day operation to improve campus resilience. A physical test-bed would help researchers develop and commercialize new technologies.

### Thrust & Coordination

We imagine a multidisciplinary water center similar to the MIT Energy Initiative in mandate. In this, the MIT Abdul Latif Jameel World Water and Food Security Lab is well poised to take a leading role. Such a center would not only bring together stakeholders in academia and industry and offer research funding, it would convene faculty and researchers with the common goal of performing impactful water research. This would encourage multi-disciplinary collaboration and result in much needed efficient progress on water-related research.

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<sup>1</sup> J. Mateo-Sagasta, L. Raschid-Sally, and A. Thebo, “Global Wastewater and Sludge Production, Treatment and Use,” in *Wastewater: Economic Asset in an Urbanizing World*, P. Drechsel, M. Qadir, and D. Wichelns, Eds. Dordrecht: Springer, 2015, pp. 15–39.