

SUMMARY OF CONCLUSIONS:

ADDRESSING ENERGY TRACKING AT WATER & WASTEWATER UTILITIES

On May 14th, 2019, the Alliance to Save Energy convened water utility, industry, business association, academic, legal, and public sector stakeholders to discuss opportunities to enhance energy management at water utilities. This document summarizes the main themes of the discussion and does not represent consensus or attribution of specific ideas to any individual participant.

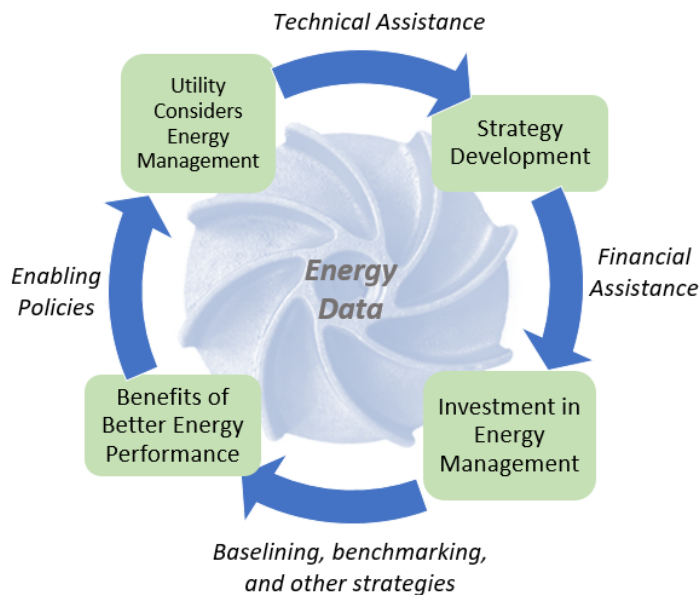
Drinking water and wastewater utilities (“water utilities”) do not use consistent practices or collect consistent data to manage and analyze their energy consumption (“energy management”¹). As a result, energy efficiency opportunities that would directly benefit the utilities’ operations and costs are underutilized.

- Water utilities are often significant energy consumers. Ensuring their operations maximize energy efficiency could provide a variety of benefits, including cost savings, enhanced operational control, and other benefits such as reduced emissions.
- However, for a variety of well-characterized reasons including regulatory pressures to maintain high water quality, low risk tolerance, tight budgets, institutional priorities, and historical precedents, water utilities generally do not prioritize energy management.
- The range of energy management performed is enormous: some utilities perform extensive energy management, while others do not pursue energy management strategies at all.
- While the American Water Works Association developed a widely accepted method for identifying degrees of water loss, there is no equivalent method established for identifying degrees of energy waste.
- There is a lack of public data on energy use at water utilities. Several surveys explore energy use in targeted groups of utilities, but there is no public source of sector-wide, consistent, and updated data.
- This results in a diverse sector with a wide – and poorly-understood – range of energy intensities, and a lack of clarity in best practices to enhance energy management.

The process for a utility to enhance energy management is complex. We should identify ways to facilitate the process for implementers.

- At water utilities, there are no uniform solutions to improving energy management.
- All new investments carry risk and require fine-tuning to fit the system and ensure resilience. The process for evaluating and customizing investments can be costly in terms of time and resources.
- However, many water utilities lack access to best practices that could facilitate their strategies.
- Neither extreme – one-size-fits-all inflexible solutions or solutions crafted in isolation – is optimal. The key is to identify best practices that can inform and facilitate a utility’s customized solution.
- However, the lack of consistent energy management data has “chicken and egg” elements. Greater transparency in the data can help facilitate decisions and ensure valuation of energy; but without a clearer valuation of energy, the value proposition is not clear.
- The figure below presents a cyclic decision-making schematic for utilities strengthening energy management. Greater data availability, along with specific policy tools and resources can all facilitate this cycle.

¹ Key energy management tools include submetering, implementing supervisory control and data acquisition (SCADA) systems, selecting and regularly tracking key performance indicators, developing a baseline of energy use, establishing a commitment to reduce energy use and building staff capacity and accountability for energy management.



The self-reinforcing cycle for energy performance management at water utilities. As utilities consider energy management opportunities, technical assistance (such as peer-to-peer collaborations or programs such as the U.S. Department of Energy's Better Plants or SWIFt Accelerator) can assist in leveraging best practices to design an appropriate strategy for the utility's needs. Financial assistance, such as State Revolving Funds, can support key investments. Once the capacity to monitor energy is increased, greater benchmarking and baselining can help quantify the benefits accrued. With an understanding of the quantitative benefits, decision-makers (in the utility management or other entity) can design enabling policies to support utilities' next steps. Throughout, greater access to high-quality energy data supports every stage.

- Multiple stakeholders can support greater energy management, from policymakers, local governments, regulators, utility leadership, utility personnel, society, and customers.
- Communication must flow well to all stakeholders – for example, if an energy management plan is in place, all relevant staff should be made aware of it and provided access to it.

Technical assistance is a clear win, and while many tools, technical assistance programs, and peer-to-peer collaborations are available, they are not enough.

- Powerful tools and programs do exist – U.S. Department of Energy (DOE) programs (Better Plants² and the SWIFt Accelerator³) can provide access to experts, tools, and guidance documents.
- However, robust technical assistance is not universally accessible to water utilities, partly due to a lack of comprehensive energy data across the water sector.
- Greater energy data availability could strengthen technical assistance tools to support water utilities' energy management. For instance, ENERGY STAR's Portfolio Manager, a foundational tool in the buildings and industry sectors, currently does not offer accurate benchmarking support due to a lack of consistent data.
- Technical assistance is particularly useful when:
 - It provides utilities with criteria to make informed decisions;
 - The engagement is formalized, either through policy statements, acknowledgement of energy management at the top levels of the institution, or even by providing permission to staff to participate in a regular conference call on the topic;
 - It applies to smaller utilities, which have less resources to establish fully-customized solutions.
- While these tools are valuable, it is still difficult for a utility embarking on a new strategy to find others with specific expertise. Scaling-up existing tools and networks may help.

² [Better Plants](#) partners with leading manufacturers and water utilities to improve energy efficiency and competitiveness in the industrial sector, saving money in the process. Partners typically set a goal to reduce energy intensity by 25% over 10 years. Three of the 25 current participants from the water/wastewater treatment sector already achieved 25% reduction in energy intensity.

³ The Sustainable Wastewater Infrastructure of the Future (SWIFt) [Accelerator](#) aims to catalyze the adoption of innovative and best-practice approaches in data management, technologies, and financing for infrastructure improvement. Partners seek to improve the energy efficiency of their participating water resource recovery facilities by at least 30 percent and integrate at least one resource recovery measure.

A solution for greater energy management must consider the following parameters.

- While there are component-level considerations to enhance efficiency and data collection at water utilities, the main opportunities for energy management result from commitment at the system level. This is challenging for many reasons.
- Such commitment must be realized on all levels from operators to management, and across a diversity of stakeholders, often including policymakers who set local energy or climate goals.
- This requires higher levels of communication among stakeholders and agreement on the value of energy management, and we have a long way to go.
- Certain governance structures can present barriers; for example, in some cases policymakers or implementers are directly disincentivized from pursuing efficiency (e.g. when capital and operations budgets are separate, or where energy efficiency results in direct budget cuts).
- Local government priorities should be aligned with action. This may require a better alignment of budgets and processes to ensure system-level and energy-saving opportunities are accessible.
- The data landscape is rapidly evolving (ranging from changes in data collection, transfer, storage, analytics, system control, to diagnostic features). This provides more opportunities for system-level management, but it is uncharted territory for many utilities.
- Utilities should monitor progress against their own historical performance, not against other utilities, as the differences between them can create inaccurate distortions in energy performance (e.g., flow and load are not the best ways to normalize energy performance for wastewater systems).

Concrete ideas to move towards a more energy efficient water sector.

- Improve baselining and benchmarking - these are natural first steps for utilities to consider.
- Create a national alliance of water utilities – scaling-up and/or connecting existing programs - to identify energy performance leaders and to connect partners to share best practices.
- Develop partnerships between academia, DOE, and regional organizations or government agencies that are concerned with the cost saving opportunities, resilience, emissions, or other energy-related impacts of water utilities.
- Create guidance for ways that water utilities can demonstrate their energy performance priorities to policymakers within the context of their local government’s energy or climate goals.
- Create policy guidelines for ensuring energy performance improvements and cost savings are rewarded at water utilities.
- Recommend that the Energy Information Administration develop a survey to comprehensively assess the energy performance of water utilities in the U.S. in a way that would be informative to federally funded technical assistance programs, including Better Plants, SWIFt, and ENERGY STAR’s Portfolio Manager.
- Compile best practices for incorporating energy performance into procurement procedures.

The Alliance thanks the Roundtable participants: *Esber Andiroglu (University of Miami), Adam Carpenter (American Water Works Association), Carla Cherchi (Stantec), Alice Dasek (U.S. Department of Energy), Ashwin Dhanasekar (The Water Research Foundation), James Eklund (Squire Patton Boggs), Patricia Gomez-Acevedo (Miami-Dade County), Jason Grant (Miami-Dade Water & Sewer Department), Matthew Grewe (Innovyze), Caterina (Katy) Hatcher (U.S. Environmental Protection Agency), Raja Kadiyala (Jacobs), Barry Liner (Water Environment Federation), Robert (Bruce) Lung (U.S. Department of Energy), Chris Macintosh (Jacobs), Marta Marello (Miami-Dade County), Loana Martin (Squire Patton Boggs), Cynthia (Cindy) Mason (Siemens), Manuel Parra (AVEVA), Sanjay Patel (IBI Group), Jim Siriano (American Water Works Association), Wayne Spittal (SUEZ Smart Solutions | Derceto Limited), Gang Wang (University of Miami)*