

# Executive Summary



## Tools for an industry looking to pursue a rigorous water strategy

A Framework for the Successful Implementation of On-Site Industrial Water Reuse (Reuse-14-04)

### The Central Issue

Industrial facilities struggle with how to enable the design, construction, and operation of onsite industrial water reuse that also adheres to the strict financial payback requirements of industry.

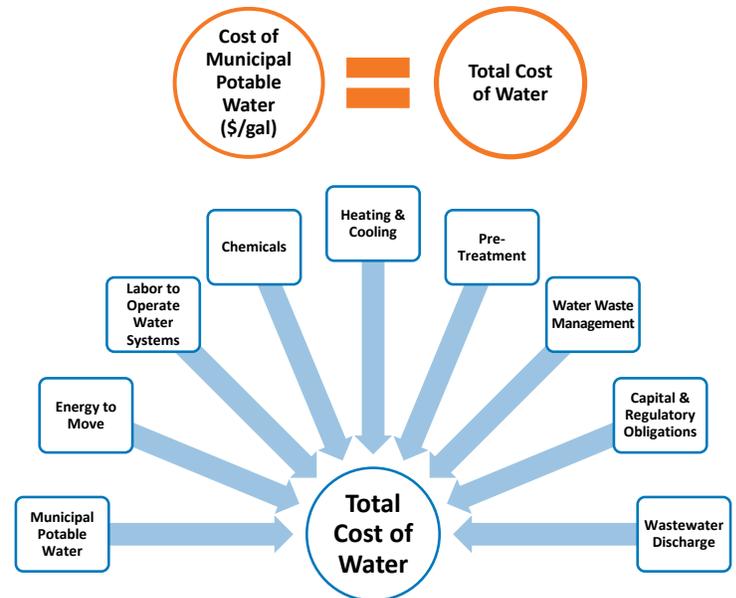
### Context and Background

The motivation and business requirements for successful water reuse and conservation projects differ greatly in the industrial setting compared to the municipal setting. Industrial settings need a framework that comprehensively outlines the implementation of onsite water reuse. The research team first conducted a literature review to evaluate existing guidance on water reuse in the industrial setting, including the influence of economic factors. Through collaboration with various industrial partners, they identified the essential elements necessary for a successful onsite water reuse program and created a collection of case studies to illustrate successful projects under a variety of scenarios.

### Findings and Conclusions

Successful water reduction, reuse, and recycle projects aligned with the objectives of industrial companies bring business value in terms of reduced costs. However, water conservation can also provide additional value such as reduced operational risks, improved community integration, and enhanced employee engagement. Many companies have failed to act because they are uncertain of how to investigate, identify, justify, and implement opportunities to improve their relationship with water.

Historically, industry has only considered the perceived cost of water (cost of acquisition) rather than the total cost of water, which includes acquisition, energy to heat, labor to operate water systems, chemicals for treatment, energy for heating and cooling, pretreatment, wastewater management, capital and regulatory obligations, and wastewater discharge. Failure to account for the total cost of water leads to financially related hurdles when facilities wish to implement any type of water conservation project. Viewing water in a holistic manner and accounting for all costs, allows for the development of a return on investment (ROI) calculation for water reuse projects that can more easily be justified in the business setting.



Perceived cost of water versus actual cost of water in industry.

The research examined common barriers to project success, how to overcome them, assistance with cost estimating for water projects, and, finally, provided an explanation of how to develop a favorable ROI and to present this to business-minded leadership for approval. This report details the Water Kaizen Blitz (WKB) process based on LEAN manufacturing principles, which differs from traditional water auditing and assessment techniques. Key characteristics of a WKB are: 1) team structure, 2) deep-dive into processes, 3) project planning and pre-WKB activities, 4) WKB live event, and 5) report out. It also highlights common opportunities for water reuse and conservation in industrial facilities. Case studies from participating industrial partners illustrate successful execution of water conservation in various industrial settings.

### Management and Policy Implications

This research presents a way to engage executive management to support planning and implementation of onsite water management and reuse.

## Industries included in the Reuse-14-04 research case studies

Automotive	Flat Glass
Food and Beverage	Paint and Coatings
Aerospace	Pharmaceutical and Chemical

## Related WE&RF Research

Project Title and Number	Research Focus
<b>Evaluation of Historical Reuse Applications and Summary of Technical/Regulatory Issues and Related Solutions for Industrial Reuse Projects (Reuse-12-03)</b>	Analyzes a representative group of successful water reuse projects, identifies critical parameters, technical capabilities, and regulatory requirements, as well as effective communication methods, and develops a report and model template that water agencies and their customers can use.
<b>Drivers, Successes, Challenges and Opportunities for Onsite Industrial Water Reuse: A Path Forward for Collaboration and Growth (Reuse-13-04)</b>	Provides a desktop analysis of current onsite industrial water reuse practices by industry sector. Provides a preliminary prioritization of the industry sectors that have the best opportunities to increase onsite water reuse practices.
<b>Scorecard for Evaluating Opportunities in Industrial Reuse (Reuse-15-03)</b>	Develops a user-friendly tool for evaluating potential opportunities and the direct and indirect economic impacts of industrial water reuse projects.

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The Coca-Cola Company  
PPG Industries  
Ford Motor Company  
General Motors Company  
Covestro



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