

## OPPORTUNITY

How much water do cooling towers use?

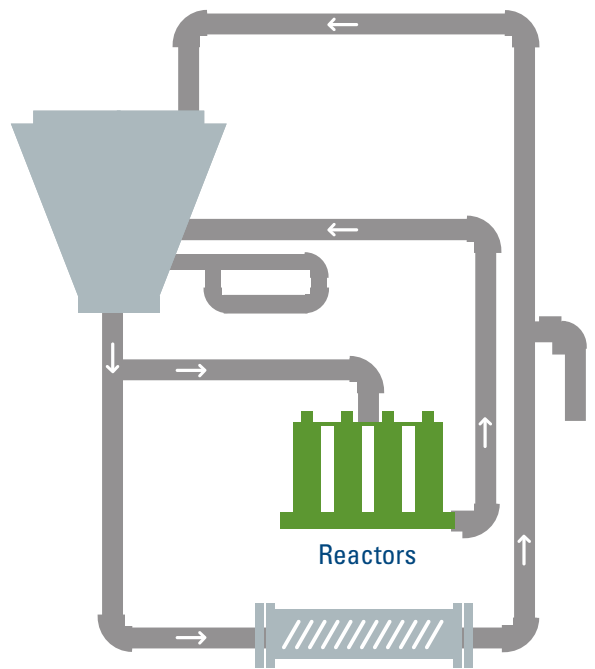
**28%** OF WATER IN COMMERCIAL BUILDINGS IS USED BY COOLING TOWERS OR OTHER HEATING AND COOLING SYSTEMS<sup>1</sup>

## TECHNOLOGY

How does electrochemical water treatment work?

### ELECTROLYSIS SEQUESTERS SCALE IN REACTOR TUBES

AND CREATES CHLORINE, A NATURAL BIOCIDES



## M&V

Where did Measurement and Verification occur?

**NATIONAL RENEWABLE ENERGY LABORATORY (NREL)** assessed an alternative water treatment (AWT) system provided by Dynamic Water Technology for two 150-ton cooling towers in Savannah, Georgia.

## RESULTS

How did electrochemical water treatment perform in M&V?

**32%**  
**WATER SAVINGS**

99.8% reduction in blowdown<sup>2</sup>

**50%**  
**MAINTENANCE REDUCTION**

Small cost increase in annual O&M contract<sup>3</sup>

**100%**  
**CHEMICAL SAVINGS**

Technology generates chlorine; reduced slime<sup>4</sup>

**2.5**  
**YEAR PAYBACK**

@ GSA avg. water/sewer \$16.76/kgal<sup>5</sup>

### Electrochemical Water Treatment Return-On-Investment

Rebates for AWT systems are available through some local water utilities

	Testbed (Before)	Testbed (After)*	GSA Normalized (After)*
Equipment (\$)	N/A	\$30,340	\$30,340
Installation (\$)	N/A	\$29,029	\$15,000
Maintenance (yr)	\$5,280	\$6,000	\$6,000
Maintenance Savings (yr)	N/A	-\$720	-\$720
Water Consumption (Gallons/yr)	3,588,156	2,454,299	2,454,299
Water Savings (Gallons/yr)	N/A	1,133,857	1,133,857
Water Savings (\$/yr)	N/A	\$7,529	\$19,003
Simple Payback (yrs)		<b>8.7</b>	<b>2.5</b>
Savings to Investment Ratio		<b>1.7</b>	<b>6.0</b>

\* Savannah testbed water/sewer \$6.64/kgal \* GSA average water/sewer \$16.76/kgal, normalized installation cost

## DEPLOYMENT

Where does the study recommend deploying electrochemical water treatment?

### CONSIDER FOR ALL COOLING TOWERS

Most cost-effective in areas with high water costs or where water is excessively hard, has high pH values and/or large amounts of total dissolved solids

<sup>1</sup>Electrolysis Water Treatment for Cooling Towers, Gregg Tomberlin, Jesse Dean, Jimmy Salasovich (NREL), December 2018, p.9

<sup>2</sup>Ibid, p.21 <sup>3</sup>Ibid, p.23 <sup>4</sup>Ibid, p.24 <sup>5</sup>Ibid, p.26