

## Computational Fluid Dynamic-Based Model

### HIGHLIGHTS

Development of advanced tools for optimizing UV system operation at water and wastewater treatment plants.

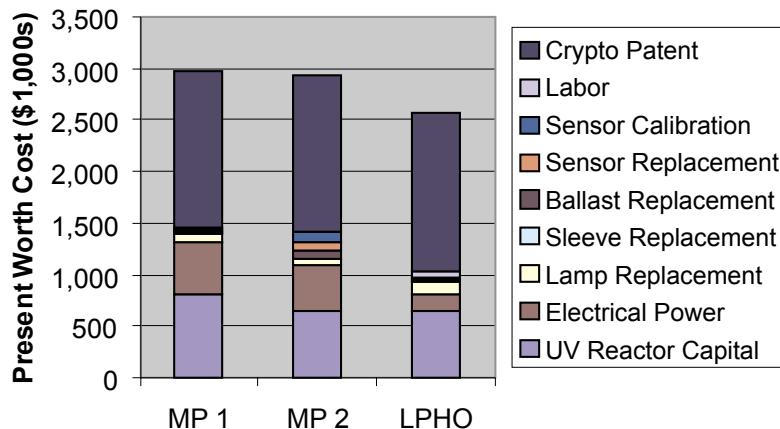
Basis for selecting lamp aging factors used to size UV systems and dose pacing strategies for system operation.

Basis for effective design strategies for UV system redundancy and backup power.

Significant energy, environmental, and economic benefits.

Carollo is the principal investigator for the New York State Energy Research and Development Authority (NYSERDA) project, Optimization of UV Disinfection. The goal of this project is to develop energy efficient strategies for designing and operating UV disinfection systems for both drinking water and wastewater applications. Carollo is working with the Lighting Research Center at Rensselaer Polytechnic Institute to evaluate the performance of commercial UV lamp and ballast assemblies. The evaluation involves pilot testing of UV systems equipped with low-pressure, high-output and medium-pressure UV lamps over a one-year period at the John P. Buckley Water Treatment Plant in Troy, New York. The evaluation will quantify the impact of operational factors such as on/off cycling and operating power level on the efficiency and performance of the UV lamps.

Combined with a survey of UV vendors and lamp manufacturers, the results will provide a basis for developing rational approaches for selecting lamp aging factors used to size UV systems and dose pacing strategies for operating UV systems. The results will also help to develop strategies for designing UV system redundancy and backup power in response to system failure and downtime. Overall, drinking water and wastewater utilities will use the results of this project to promote the cost-effective application of UV disinfection, thereby providing energy, environmental, and economic benefits.



*The life-cycle cost analysis tool developed through the NYSERDA project will be useful in comparing different UV technologies.*