BLUEiQ
BY IBI GROUP

Real-Time Energy Management for Water Distribution

BlueIQ by IBI Group is an innovative software solution, integrating with SCADA, that assists with the control of water distribution pumps and valves. It has been proven to reduce system-wide energy costs with an associated reduction in greenhouse gas emissions, by more efficiently using existing water distribution assets.

Using predictive analytics and optimization, BlueIQ provides significant benefits to water utilities including:

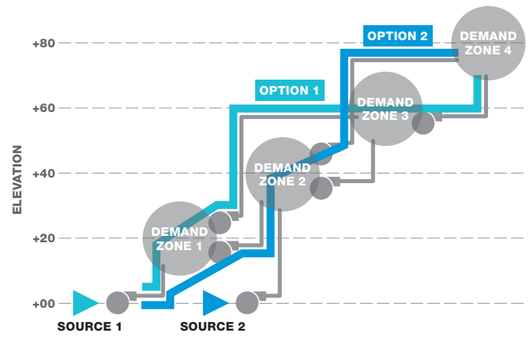
- Reducing operating costs
- Reducing greenhouse gas emissions
- Reducing operator variance through hybrid automation
- Operating within the required level of water quality and service delivery to customers

ibigroup.com/ibi-products/blueiq/

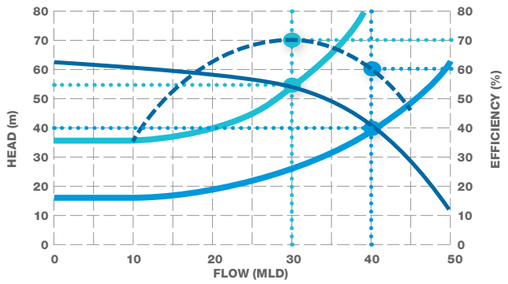
How to operate most efficiently?

A water system's complex network often allows for operational strategy options, posing the question 'what is the most cost effective pumping strategy to provide the required level of service?'

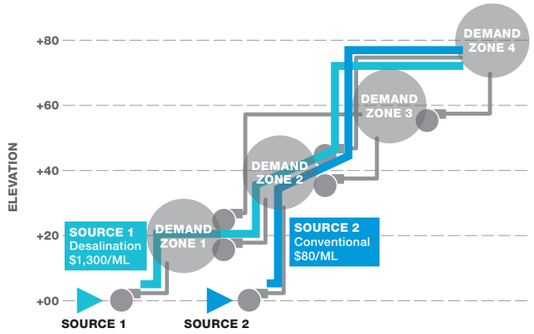
1 MOST EFFICIENT PATH OF WATER



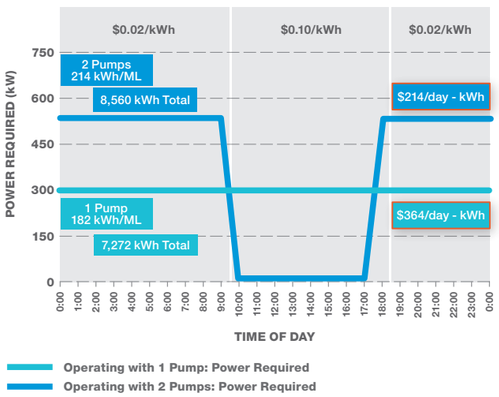
2 INDIVIDUAL PUMP EFFICIENCY



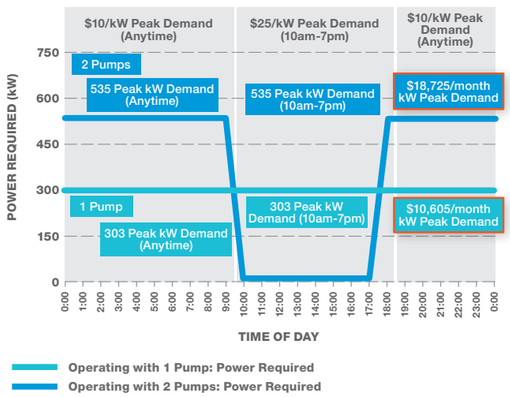
3 SOURCE SELECTION CONSIDERING COSTS OF PRODUCTION



4 LEVERAGING TIME-OF-USE ENERGY COSTS



5 PEAK KW DEMAND REDUCTIONS

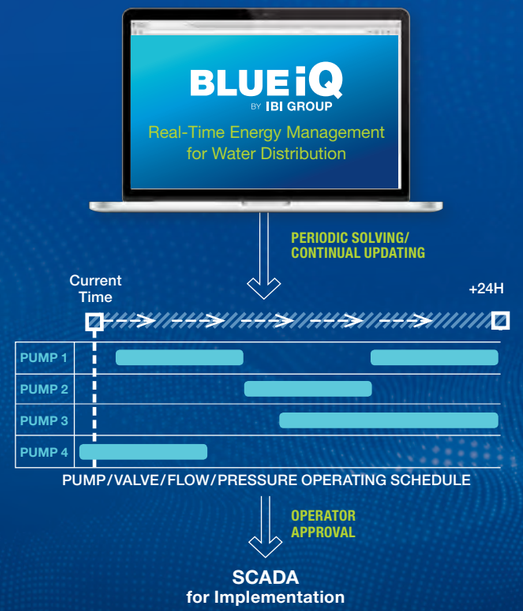


The Solution

BlueIQ by IBI Group uses a variety of real-time input data feeds to determine the optimal operational strategy of existing water distribution assets.

- Real-time weather and historical water demand to predict the future water demand
- Energy tariff structures, real-time and historic spot market energy price to predict the fluctuating energy cost
- EPANET hydraulic model to mathematically formulate the complex pressure and flow relationships with respect to water demand, pipe, pump, valve, reservoir and source characteristics
- SCADA data for the current status of the system
- Hydraulic and water quality constraints representing the required level of service

REAL-TIME FEED



Reduce...

Number of kWh consumed

1 MOST EFFICIENT PATH OF WATER

2 INDIVIDUAL PUMP EFFICIENCY

Cost of production

3 SOURCE SELECTION CONSIDERING COSTS OF PRODUCTION

Cost of kWh consumed

4 LEVERAGING TIME-OF-USE ENERGY COSTS

5 PEAK KW DEMAND REDUCTIONS

A non-linear, mathematical model of the system and pump station energy costs is formulated to allow the pump and valve schedule to be optimized periodically and quickly enough for immediate use. The most cost effective operating strategy to provide customers the required level of service is maintained, despite unexpected variations and changing system conditions.

USE CASE

Toronto Water is the largest water utility in Canada, and one of the largest in North America. BluelQ by IBI Group is currently saving annual energy costs for the utility.

Toronto Hydro, the local energy distribution company, and Toronto Water have verified a reduction of approximately 8 million kWh per year equating to over $1 million in cost savings through reduced kWh consumption alone.

There are additional system-wide cost reductions from managing time-of-use kWh energy prices, peak kW demand charges, and the various source production costs.

"This is a completely new technology package that provided a customized solution for Toronto. Combining all the real-time inputs, with an accurate calibrated hydraulic model, and generating a proven and effective advanced pump schedule has significantly reduced Toronto Water's operating costs."

– TORONTO WATER

IBI

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