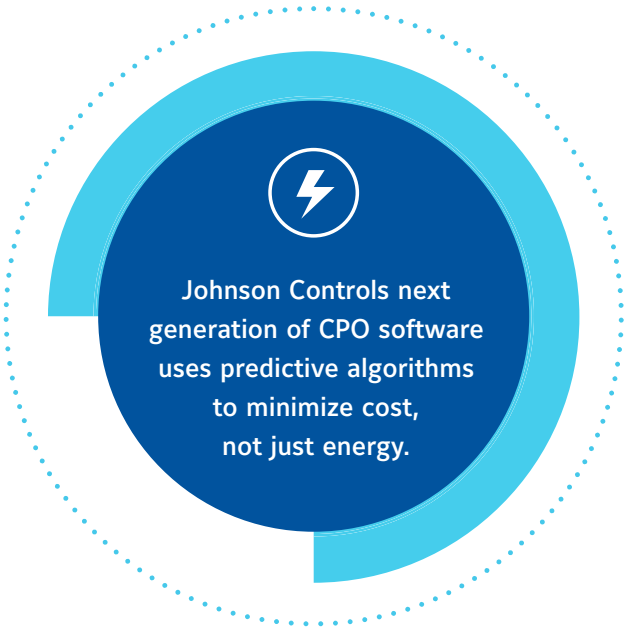
See the future and be prepared to adapt.

Central Plant Optimization



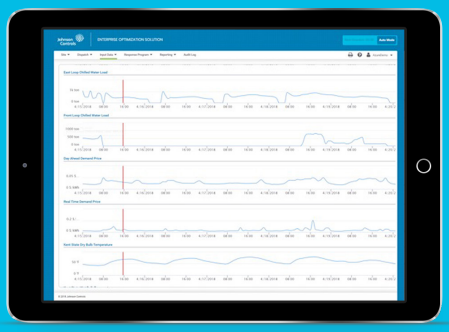
What if you could predict the future?

And better yet, what if your central plant automatically made adjustments to prepare for that future? Johnson Control's next generation of Central Plant Optimization (CPO) software uses predictive algorithms to minimize cost, not just energy. This proven, patented technology uses up-to-the-minute data and looks out over a time horizon to help operators optimize cooling, heating and power generation in a holistic way. The approach helps make both plant design and operating decisions to minimize lifecycle costs and greenhouse gas emissions while delivering reliable utility services.

Johnson Controls

IT'S TIME TO CHANGE THE RULES and truly optimize your costs.

It's challenging to minimize energy costs in central plants without compromising your number one priority – reliable service. Every hour of every day plant engineers could consider hundreds of possible equipment combinations and set points to maximize energy efficiency. Ever-changing loads, weather and utility prices add to the complications. The number of decisions an operator could make is staggering.



A holistic way to optimize. Every 15 minutes.

The CPO software optimizes dispatch decisions every 15 minutes to minimize utility costs and maximize potential utility program revenues based on a myriad of ever-changing inputs:

Equipment Performance Models

Every major piece of equipment, including chillers, boilers, pumps and cooling towers has a model that predicts the equipment's energy performance and cost under all operating conditions. These models are adaptive, so as equipment conditions change, the system tunes the models to optimize performance.

Weather Forecasts

Seven day forecasts for temperature, humidity and cloudiness are pulled from a web-based source for your specific location. The algorithms recognize that forecast accuracy improves as events draw closer in time. These inputs are used to predict loads, equipment performance and ambient conditions.

Load Predictions

CPO predicts hourly cooling, heating and power loads for the next seven days. These predictions are based on historical loads, weather, day of week, time of day, building schedules, and special events. The tool then adjusts operations and makes decisions based on those predictions to ensure the reliable delivery of utility services.

Utility Pricing

CPO can model everything from the simplest flat rates to more complex time-of-use and demand-based rates, and to the most complex – real time pricing and market-based incentive programs. The cost-based approach to optimization is necessary to properly handle electric demand charges, or other more complex tariffs. In fact, traditional approaches to optimization have little to no way of addressing demand charges, which can represent a major portion of the utility budget.

Calendars and Maintenance Schedules

The software accounts for building schedules to predict loads by incorporating weekends, holidays and special events. Equipment maintenance schedules are also used to optimize the systems before, during and after equipment is taken out of service. And anytime equipment goes out of service unexpectedly, CPO re-optimizes based on the remaining available equipment.

Johnson Controls

Transformational technology driving the future of optimization

Scalable software.

Central Plant Optimization from Johnson Controls is a unique, scalable software that uses real-time information to make adjustments that reduce energy use and operation cost, without sacrificing reliability. It provides new ways to design, build and operate central plants. CPO is the future.

Johnson Controls

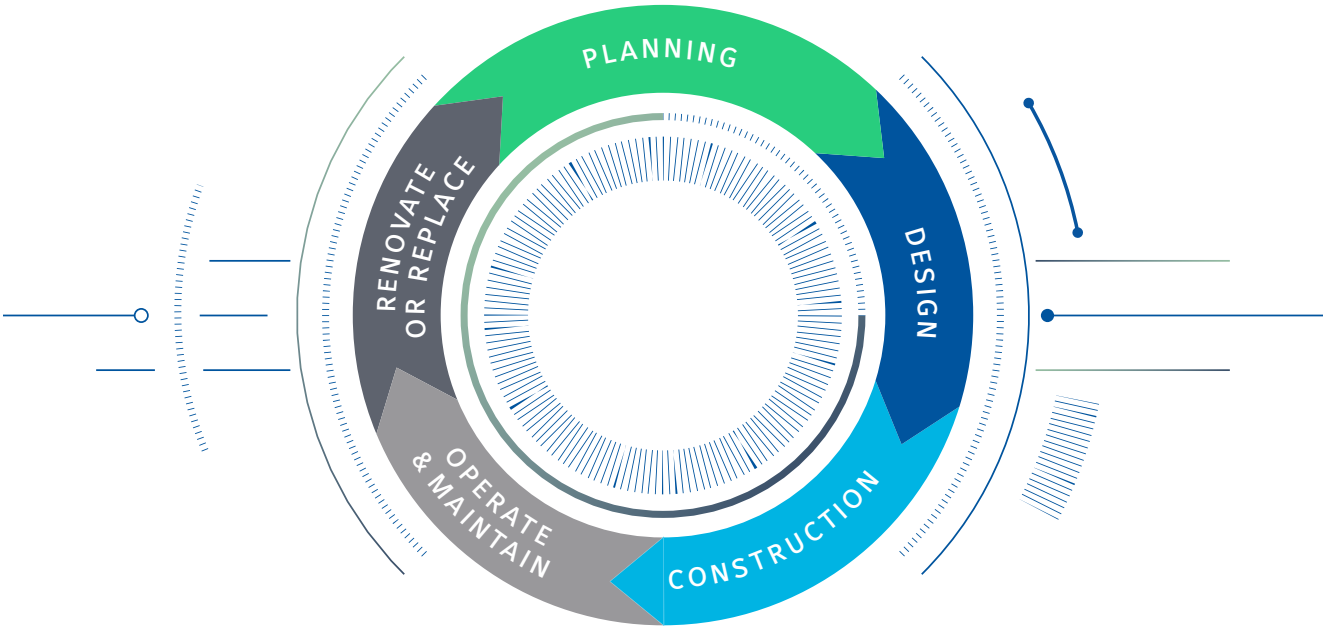
CPO features two tools with one goal: lifecycle cost savings.

The CPO Planning Tool optimizes design.

Much of a plant's future operating costs are locked in when making initial plant design decisions. The cloud-based CPO Planning Tool creates a virtual representation of your central plant and simulates plant utility costs for each hour of the year. It allows you to perform "what-if" scenarios, evaluate plant designs and upgrades, and compare actual performance with the original predictions. Plus, it interfaces seamlessly with the CPO Operational Tool to ease the process of installing and maintaining the CPO system over time.

The results?

- Identifies optimal central plant configurations
- Helps to right-size plant equipment to reduce first cost
- Informs design decisions to reduce lifecycle operational costs



The CPO Operational Tool minimizes costs. Immediately, automatically, and continuously.

Approximately 80 percent of a central plant's lifecycle costs are tied up in operation and maintenance. The CPO Operational Tool helps plant engineers and operators to minimize these costs.

The results?

- Achieve persistent 15-30% central plant energy and water cost savings
- Shorten the learning curve for a new staff
- Adapt to time-of-use utility pricing, peak demand charges, or demand response signals
- Allows more time for proactive maintenance

Johnson Controls

A breakthrough solution.

Past approaches to central plant optimization use sequence of operations based on rules of thumb and a limited number of inputs. Johnson Controls is redefining the industry by delivering true cost optimization. CPO not only saves millions of dollars in utility costs over the life of your central plant, it doesn't compromise reliability. And it helps operators quickly make the right decisions and frees up time for more valuable activities.

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CPO software is based on Johnson Controls extensive experience in operating and maintaining central plants, along with over a century of HVAC equipment development. The multi-patented CPO software leverages an advanced technique, called Model Predictive Control (MPC), long used in the process control industry. MPC technology is flexible and can be applied to central plants with any type of automation system, any brand of equipment and any configuration. This means you can apply CPO technology at a low start-up cost. With each year's new budget, you'll drive more savings.

Choose the way you operate your central plant.

CPO offers two modes of operation. In advisory mode, CPO can act as a "GPS" for your central plant, providing continuous operating recommendations to plant operators. In auto mode, the software serves as an "autopilot," sending dispatch commands directly to the plant automation system, while informing operators of each change well in advance.

Johnson Controls

CPO will manage your central utility plant anywhere, any size.

Save Money | Save Energy | Save Water | Earn Rebates | Validate Savings

Johnson Controls is the world's leading supplier of HVAC equipment, building management, fire protection and security systems. With more than 130 years of experience in controlling temperatures and managing comfort and safety, we can bring unmatched expertise and operational knowledge to your central plant. No matter where you are, what type of facility you own or how large or small a central plant you manage, CPO will save you money by reducing energy usage, utility costs and operating expenditures. With CPO, you have the technology to make the right decisions.

Learn more about Central Plant Optimization at www.johnsoncontrols.com/digital or call 1.877.976.9593

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