

WATER WAYS

Idaho Power's
Water Supply Cohort
Success Story



An IDACORP Company

co-hort • noun • ´kō hōrt

A group of people banded together or treated as a group.

Fact is, public water and wastewater utilities consume 3–4% of all U.S. energy. Energy is a significant cost, accounting up to 40% of a water utility's operating budget, or even more for small systems. This proportion is expected to increase as our population increases and water quality standards — per the United States Environmental Protection Agency — become more strict. According to the Water Research Foundation and New York State Energy Research and Development Authority, approximately 80% of energy use goes to pumping and distribution costs with the remainder for treatment. Idaho Power can help.

Idaho Power created the Water Supply Cohort to reduce energy use — and the resulting costs — through a series of hands-on workshops, implementation of efficiency measures and evaluation. Participants learn from their peers and energy experts to better understand their water system and reduce their energy use.

**ENERGY IS A SIGNIFICANT
COST, ACCOUNTING FOR UP TO**

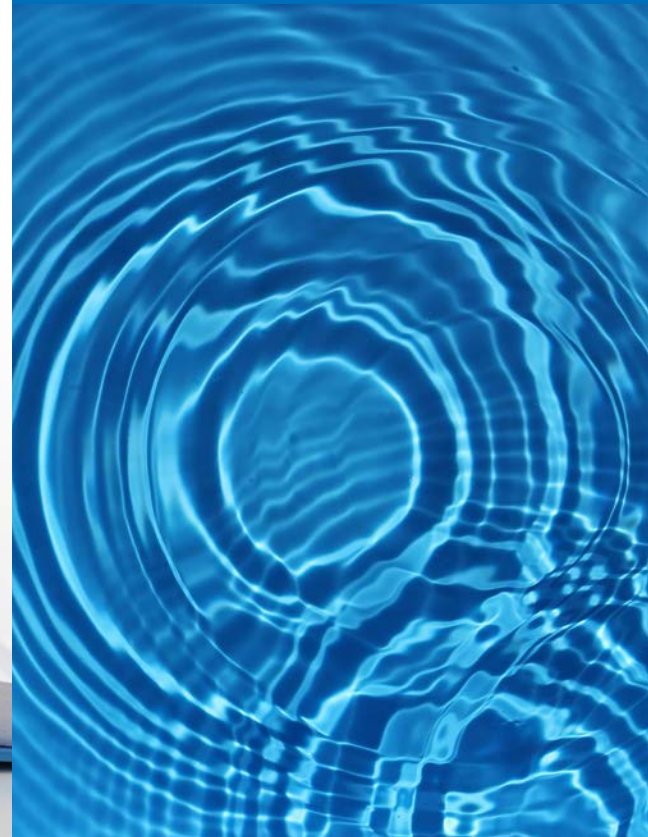
40%

**OF A WATER UTILITY'S
OPERATING BUDGET.**



**“The cohort process works!
Participants should be very
proud – for not only delivering
high-quality water reliably
to their customers, but also
identifying inefficiencies
and developing sustainable
solutions that save energy
and money. Their enthusiasm
for their product — water —
and saving their city money is
contagious, which is why the
cohort works so well.”**

**~ Chellie Jensen,
Idaho Power Senior Engineer**



WHAT WE DO

Idaho Power's Water Supply Cohort identifies ways to reduce energy use, share best practices, and develop technical expertise. Our program helps water utilities:

- Understand how to use storage efficiently
- Prioritize water sources
- Manage pressures
- Avoid unnecessary pumping
- Identify and implement low- or no-cost efficiency opportunities

THE GOAL

The cohort will help you identify and implement energy saving opportunities and ensure these savings are maintained over time. The goal is to identify operational improvements and potential capital projects to enhance energy use in water systems. You'll gain a greater understanding of your system and learn from others who have overcome similar challenges.

WHO'S INVOLVED

The cohort brings together water operators, engineers and managers from around the state, as well as outside engineers and Idaho Power's energy experts. Working together, our team identifies specific, measurable efficiency goals over a 24-month period. A recent cohort included representatives from:

- **American Falls**
- **Chubbuck**
- **Dietrich**
- **Eagle**
- **Fruitland**
- **Hailey**
- **Hazelton**
- **Jerome**
- **Ketchum**
- **Kimberly**
- **Kuna**
- **Meridian**
- **Mountain Home**
- **Suez**
- **Twin Falls**



MEASUREABLE RESULTS

By combining system-wide energy- and water-use data with your system's hydraulic model, the cohort provides an opportunity to minimize your system's energy footprint, while maintaining the highest standards for water quality and pressure.

Almost every water utility can save energy — some by as much as 30% in the first year. Typical savings range from 5–25% through energy saving upgrades and operational measures.

The 15 members of a recent cohort optimized their systems and saved over 2.4 million kilowatt-hours (kWh) — enough energy to power 212 average homes for a year!

2.4

MILLION KWH:

**THE CUMULATIVE ENERGY
SAVINGS ACHIEVED THROUGH
A RECENT COHORT**



COURSE SCHEDULE

After the kickoff workshop, three half-day workshops are held over the next few months at locations throughout Idaho Power's service area. Between workshops, support is provided by a team of engineers with specific experience in optimizing water systems. At the end of the cohort, a half-day "report out" session ends the course.

WHAT WE COVER

Through the cohort, participants gain:

- Technical training, including practical changes resulting in sustainable energy savings
- Onsite assistance and remote support from engineers with experience optimizing water systems
- A Savings-verification Report to confirm energy and cost savings
- Potential for Idaho Power energy efficiency incentives
- Continuing Education Credits
- Deferred or eliminated capital improvement projects
- Improved chlorine residual/reduced disinfection byproducts
- Increased life of pumps and motors
- Improved system reliability
- Greater operator confidence (and the resulting peace of mind)
- A tactical course for long-term sustained savings by creating and implementing an energy management system
- Information and training on reducing energy use and costs, water use and costs and reduced pressure swings

WHO SHOULD ATTEND?

Ideal candidates should have a dedicated, onsite team of representatives that include the system manager and lead operator. Throughout the cohort, participants will be encouraged to:

- Learn about energy-efficient optimization practices.
- Think creatively about their own system.
- Share experiences and ideas with peers at other facilities.
- Implement low- and no-cost energy-saving measures.
- Share energy use data with Idaho Power, as well as other data that influences energy use. All data will be treated as confidential.

Participants should have support from management around energy-efficient practices and professional development. The cohort requires participation from the water superintendent, manager (or other supervisor), and an appointed "energy champion" and "data master."

CASE STUDY

“L” is for Leaping and Looping

The City of Boise has seen tremendous growth throughout the past decade. According to Forbes, population grew by over 3% in 2017, making it the highest percentage growth for any major metropolitan area. One part of town that’s booming is Columbia Village, a neighborhood tucked into Boise’s southeast end. The area is served by three main lines, and Suez’s Bill Carr saw Idaho Power’s cohort as a great way to investigate the area’s PRVs.

Carr calls Columbia Village a prime example of leaping and looping. It’s a complex system that requires a lot of energy to push water up and down a hill, and provides an excellent opportunity for energy savings. Through the cohort, Carr and Suez found some of the PRV settings were not as efficient as they could be, so they installed PRVs partially up the hill to feed laterally into areas where the water will be used. With this framework, water is no longer pumped all the way up the hill.

“Working with Idaho Power and its consultants, it’s the first time we’ve developed an ‘easy-to-use’ model,” Carr said. “We’ve taken that model and figured out how to turn on different wells to keep water back into the higher zones.”

Carr said before the cohort, Suez always had people who thought about energy, but it was limited to their own silos. The cohort helped break down the silos between departments and has brought the entire team together. Now, energy is everybody’s job. They’ve also worked with a companywide energy czar to develop an energy dashboard. Now, 90% of Suez’s energy intensity is tracked with kWh monitors. This gives the company an online analysis of their energy use at their fingertips.

“The cohort helped us put together an energy team,” Carr said, “and it’s stood the test of time. Now, every time we design a new project, energy is discussed.”

One of the most valuable things Carr took away from the cohort process is data analysis. The cohort helped Carr and Suez identify inexpensive fixes, such as closing a valve or making changes to PRVs, that can add up to real, measurable savings. For Carr, the process gave him and his team an opportunity to reexamine the way they work.



Leap-ing • verb • lēpiNG:

Boosting water to a higher zone than necessary, and using pressure-reducing valves (PRV) to supply a lower zone.

Loop-ing • verb • lōōpiNG:

Redundant pumping of the same water. This can occur when water descends through a PRV into a lower zone and then is boosted back into the original zone.



“The cohort will make your system better because you’ll understand your system better. It forces you to ask, ‘is this system as efficient as it could be?’ And the answer is, ‘probably not.’”

~ Bill Carr,
former Suez Water
Production Manager

CASE STUDY

“L” is for Leaking

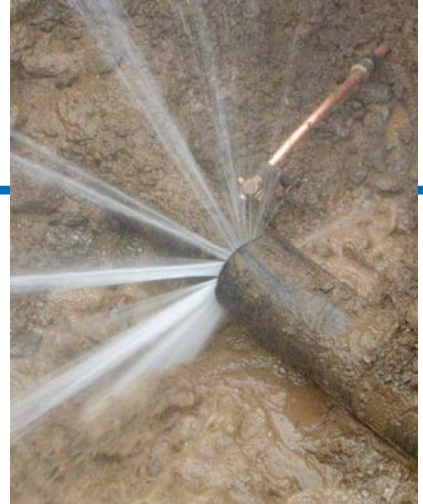
Nestled in the shadow of the famous Sun Valley Lodge, the City of Ketchum hosted snow-seekers from around the world since the 1930s. Some of its water supply lines are nearly as old as the city itself. The all-steel Ketchum Springs Water (KSW) lines were installed in the 1950s to replace older, wooden units. Now the lines are getting another fix, and all but 4.5 miles have been replaced by PVC lines which can be pressurized to 150 to 200 pounds per square inch (psi). The old lines run at around 55 psi and, according to operator Gio Tognoni, while pressure is maintained, they’re losing water.

“The old lines are rusting, corroding and coming apart,” Tognoni said. “We discussed an energy-saving project with Idaho Power and found if we can cut 150 million gallons annually, then our pumps simply won’t need to run as much. Factoring kWh into it, it’s killing us in some aspects.”

Shortly after the cohort ended, the city found five major leaks on the old KSW line. Some areas had been leaking for an extended period but, because they’re resting on river bottom, it took a long time to notice. Some leaks were estimated to run at around 25 gallons per minute. While increasing the efficiency of pumps is always good, it doesn’t amount to much if you’re still pumping straight into the riverbed.

“Through the cohort, there were definitely some light-bulb moments,” Tognoni said. “We made some gains by changing pumping practices, but it’s hard to do it when you know that you have that much old line in the ground that’s costing you money.”

Tognoni also found, while no two systems are the same, changing out lights and ballasts in the pumps houses and scaling back heating from 70 to 80 degrees can help any system. And by getting people from different municipalities together in the same room sharing stories, he found they were all facing similar issues.



Leak-ing • verb • lēkīNG:

Water loss through aged pipes, loose equipment and unmetered use. Water loss amounts to energy and revenue loss.



“The cohort is worth the time and investment, because there’s a lot to learn. There’s a lot that came out of it, but then it takes going home and getting people on board with it and coming up with solutions. With the pipe conversion, we knew our chance for a big increase in our efficiency was coming.”

~ Gio Tognoni,
City of Ketchum
Senior Utilities Operator

CASE STUDY

“L” is for Loading

The City of Kimberly, just east of Twin Falls, serves over 4,000 residents with water from six deep wells. According to foreman Jed Kloer, the system generally works well and keeps the community satisfied. That said, there’s always room for improvement, especially in efficiency.

“They weren’t bad wells,” said Kloer, “it’s just that we discovered through the cohort that several were terribly inefficient compared to the others.”

Four of the six wells run only during emergencies, and then every other month to cycle fresh water through the pipes. The two most efficient wells now seldom shut off; they’re kept running during peak flows, and the city turns to its tank wells to satisfy demand during off-peak hours. The city loads the tanks before peak demand and, once that passes, there’s typically enough storage in the tank, and the batteries begin to fill again in anticipation of the next peak.

Through Kloer’s work with the cohort and the engineers, the city achieved the efficiency levels it was hoping for. In fact, they saved 15–18% of their overall power bill for producing water.

“It was relatively easy, and we really didn’t struggle,” said Kloer. “The savings were huge, and much more than what was projected had we not participated in the cohort.”

More than anything, Kloer said, the cohort taught the city to be open to new ideas, to look beyond business as usual. For Kloer, and for the entire city, participation in the cohort was worth the time.



Load-ing • verb • lōdīNG:

Intermittent pump operation — spikes for short durations.

This can occur when a facility is oversized for the current demand or when equalization storage is not used efficiently.



“You have to put the effort into it. But once you get going, we found it’s just as easy to operate efficiently as it is to not.”

~ Jed Kloer,
City of Kimberly
Public Works Foreman

CASE STUDY

“L” is for Losing

The City of Jerome is the second largest city in Idaho’s Magic Valley region, home to over 11,600 residents. The city continues to grow at a rapid pace, with the dairy industry as one of the main driving forces of the economy.

The city is planning to split the water system into a minimum of three pressure zones through the main part of town. Jerome plans to install new PRVs and repair existing PRVs. This will allow pressure to be reduced on the western zone, allowing the Marshall well to operate more efficiently by serving a lower head zone as much as possible.

The upgrades will reduce pressures in parts of town, and in turn, reduce the City’s pumping costs. The upgrades will also prevent further wear and tear of infrastructure, minimize leaks, and create more user-friendly pressures and flows for the City’s growing customer base.

The examples, data and support provided by the Water Cohort helped Jerome’s City Council get on board with the new project. They were able to see the projected savings and incentives offered by Idaho Power before the project even got started.

“We have known we needed to make some changes to our system for some time, and the water cohort has given us the ability to move forward,” said Water Operations Supervisor Brian Ahrens.

Ahrens said the success and savings of upgrades made through Idaho Power’s wastewater cohort proved how valuable cohorts can be.

“The City of Jerome is not alone in that some of our infrastructure is becoming outdated. Idaho Power offers scoping audits which can show us savings and incentives on future replacement projects. Installing new, more efficient equipment is a long-term investment that will save on energy costs for a long time to come.”



**Los-ing • verb •
lōōziNG:**

**Breaking pressure or losing
beneficial head prematurely.**



**“We have known we needed
to make some changes to
our system for some time,
and the water cohort has
given us the ability to move
forward.”**

~ Brian Ahrens,
City of Jerome Water
Operations Supervisor

CASE STUDY

Chubbuck Parks Get Water Wise

The City of Chubbuck is another of Idaho's fast-growing urban areas. Just north of Pocatello, the area offers plenty of opportunities for outdoor recreation. For water sports enthusiasts, the Snake River is just a short drive away, and a nearby ocean of lava flows draws visitors from around the country to Craters of the Moon, one of Idaho's national monuments.

And then there are the city's parks, which offer baseball, basketball, tennis, volleyball, horseshoe pits, and miles of beautifully maintained walking paths. Like any city park, these facilities require a lot of water to keep their grassy areas looking good.

City parks are often unmetered, and the Parks Department may not be charged for water use. Many city parks also use groundwater for watering, which typically uses much more energy than surface water. Here, Chubbuck officials saw an opportunity to save both water and energy.

"A lot of our parks have been running on city well water," said city electrician Mike Wise, "and we saw an opportunity for savings by switching over and using our canal water rights."

Turns out, Wise and the city were right. The Parks department cut its water use by about a third, with no negative effects. "By not using city water, we've taken a lot of load off our city wells and, overall, we're pumping much more efficiently," Wise said.

The city has always looked for areas where it could save energy, such as taking advantage of Idaho Power incentives for lighting upgrades. However, since participating in the cohort, the topic comes up more often, and energy is a part of the discussion in any new project — especially around pumping water.

"In the past," Wise said, "as long as we had water, we were good to go. Since we've been a part of the cohort, we think about energy a whole lot more."

Specifically, the number of classes offered, the engineering support and the group discussions were extremely valuable for the City of Chubbuck. This is especially true for other smaller cities that may not have the resources to devote to water and energy savings — and solutions.



"You listen to some of the issues that other cities have, and you learn from them. It was good to hear their stories, and it's definitely worth the time. Since we've been a part of the cohort, we think about energy a whole lot more. Don't hesitate to get involved."

~ Mike Wise,
City of Chubbuck
Maintenance Electrician



WHY THE COHORT WORKS

The water industry is conservative and risk averse, as operators seek to avoid violating their permits — or losing their jobs. Our cohort works by leveraging collaboration between your team and your peers and identifying commonalities. These include:

- **Common Needs:** Water supply plants share similarities, and one person's knowledge and experience can benefit all participants.
- **Large Energy Users:** Since the water supply system is often one of a city's largest energy users, it is a good candidate for finding energy-saving opportunities.
- **A Noncompetitive Industry:** Your operation is typically not competing with other cities. This creates an atmosphere where participants feel empowered to share their thoughts, experiences and successes.
- **An Expert Helping Hand:** Given small and/or strict budgets, city water facilities often lack access to outside, expert engineers. The cohort provides this resource.

HOW IT WORKS

Water experts use an extended-period hydraulic model to find optimization opportunities. It simulates how each water system performs under various conditions while ensuring water quality and desired pressures are maintained. A mass balance and an energy map is also created to determine the most efficient well and booster facilities.

An energy model organizes and illustrates a system's operational data—including energy use. Participants provide historical operational data that affect their system's energy use, and Idaho Power provides historical energy use data before the first workshop to create a baseline energy model.

Idaho Power then gathers current system operational data — including energy use — and creates monthly energy models and reports for each participant.

EXPERT GUIDANCE

Persuading operators to make changes — even those resulting in positive results — requires credibility and trust. Idaho Power is a trusted advisor for water systems and, through the cohort, has partnered with industrial energy efficiency and water engineering experts.

MEASURABLE SAVINGS

The energy model calculates the energy that would have been used if no energy efficient changes were implemented in the system, based on current operating conditions. Energy-saving tactics and strategies are implemented during the cohort. By comparing current energy use and modeled energy use, we can provide an accurate picture of a system's energy savings.



THE HIGH-WATER MARK

Idaho Power's water cohort delivers proven results. Our goal is to show cities that energy is a manageable cost. The methods learned at our cohorts can be applied to other city services, such as wastewater, parks and fire stations.

Participants in our Wastewater Energy Efficiency Cohort saved 8% from implementing low- and no-cost improvements. And at a recent water cohort, participants averaged savings of 5–10%, and one reached 16%! Our method provides tangible, proven savings.

EARN CASH INCENTIVES FROM IDAHO POWER

Beyond the lessons learned from your peers in the cohort, you'll have the opportunity to earn cash incentives through Idaho Power's energy efficiency programs.

Incentives are calculated over the course of the cohort. After the cohort, Idaho Power analyzes the total system savings and pays you an incentive of 2.5 cents per kWh, up to 100% of eligible costs! Capital measures and incentives are netted out of the cohort savings.



DON'T TAKE IT FROM US...

Our results speak for themselves — and so do our cohort participants! Here are a few quotes from recent participants:

“Before starting with the cohort, our energy management plan didn’t exist. Now we include energy in discussions with the mayor, engineers and hydrology consultants. The number-one thing we’ve taken away from this program is to always look for energy savings.”

~ Ken Acuff, City of Eagle Water Superintendent

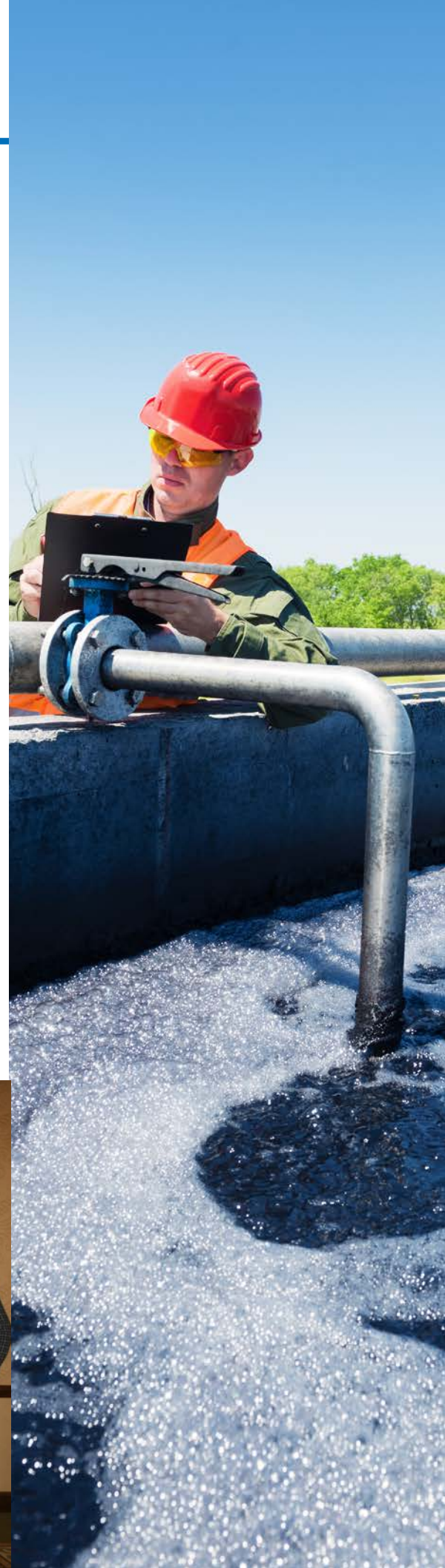
“Taking time to plan and devoting resources to energy efficiency is key to success. Some of the efficiencies were relatively inexpensive to implement.”

~ Bill Carr, former Suez Water Production Manager

“The City of Kimberly would like to thank everyone at Idaho Power for their support, and giving us the incentive to reduce our power consumption!”

~ Jed Kloer, City of Kimberly Public Works Foreman

Overall, our recent cohort participants rated the level of group interaction and cohort content as “just right,” and said “small changes add up.”



READY TO TAKE THE PLUNGE?


Idaho Power is interested in helping you with your capital upgrades and also gauging interest for future Cohorts. If your community would like to reduce energy use and save money on the operation of treatment plants or other facilities, contact your energy advisor or Custom Projects team at **208-388-5099** or email **customprojects@idahopower.com**.







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