

Maximizing the Value of Utility Options



Avista Utilities is the operating division of Avista Corp., with a history of innovations rooted in the renewable energy they've generated since their founding in 1889.

Avista has been recognized by Ethisphere, a global leader in defining and advancing the standards of ethical business practices, as one of the 2021 World's Most Ethical Companies.

Industry: Power & Utilities

Location: North America

Use Cases: Automation, Portfolio Optimization, Cost Reduction, Operations, Production, Resources,

Website: www.myavista.com

Results

- 1000x faster problem-solving
- 10% financial savings on trading floor

Avista had tried other solutions but found them to be slow and lacking precision. With their Avista Decision Support System, powered by Gurobi, they can solve complex utility problems in seconds.

Founded in 1889, Avista Utilities is a publicly owned energy company that provides electricity to over 400,000 customers and natural gas to over 350,000 customers across four northwestern states.

As new technologies have emerged over time, Avista has worked to help its operators and traders produce more electricity with a given amount of fuel and installed capacity—but this still requires a lot of complex, time-consuming analysis.

After finding that available solutions did not meet their requirements, Avista developed and launched the Avista Decision Support System (ADSS), a commercial-scale capacity model powered by Avista-patented algorithms and the Gurobi Optimizer. ADSS reduces the amount of manual decision-making by solving complex utility problems within seconds.

Solving Extremely Complex Utility System Challenges

ADSS is a commercial-scale capacity model with algorithms that represent the significant physical and operational

characteristics of utility system portfolios. It can analyze and evaluate reserve products, such as ancillary services and intermittent generation.

The system provides granular insights into potential utility problems decades into the future, but its solutions are also engineered to consider capacity challenges with timeframes as short as 60 seconds. This helps Avista to better utilize its resources, keep maintenance costs low, and maintain a balance of supply and demand. It also gives their operators more time to concentrate on higher-value tasks, with less time spent crunching numbers on a calculator.

Avista had previously tried using a number of different products, but they found that other systems lacked precision or were simply too slow, which is why they decided to build their own. Still, with time, managing their own system proved to be a heavy challenge.

To support the high-performance goals for ADSS, Avista turned to the provider of the world's fastest mathematical optimization solver, Gurobi. Together, they are tackling problems that have historically taken a thousand times longer to solve.



“With Gurobi, our mixed integer program began performing about 50 times faster.”

Clint Kalich

*Senior Manager of Resources Analysis,
Avista Utilities*

“Having looked at other competing products, I think the most efficient solution for businesses is to just let Gurobi try out their problems. It’s affordable, and I think it saves everyone a lot of headaches.”

Clint Kalich

*Senior Manager of Resources Analysis,
Avista Utilities*



By Running ADSS with Gurobi, Avista Experienced Significant Time and Cost Savings

After trying several solvers, Avista found that Gurobi offered the best value and performance for their needs.

With support from Gurobi, ADSS can:

- Better inform commodity trading
- Ensure more reliable service and higher asset availability at a lower cost
- Use analytics to evaluate new resources and enhancements to existing assets

With the improved performance of ADSS with Gurobi, Avista has identified financial savings on the trading floor of up to 10% per week, with most weeks averaging around 2%. Avista expects equal if not greater value from using ADSS across the enterprise for

applications such as long-term planning and asset management.

“With Gurobi, our mixed integer program began performing about 50 times faster,” explained Clint Kalich, Senior Manager of Resources Analysis at Avista Utilities. “And when we did notice that Gurobi was slowing down in the spring, which is when we have high flows on our hydro systems, we brought it to their attention and there was a clear desire to identify and fix the problem. So, a few changes were made and our performance was back up again. That’s when we saw that the customer service was really impressive.”

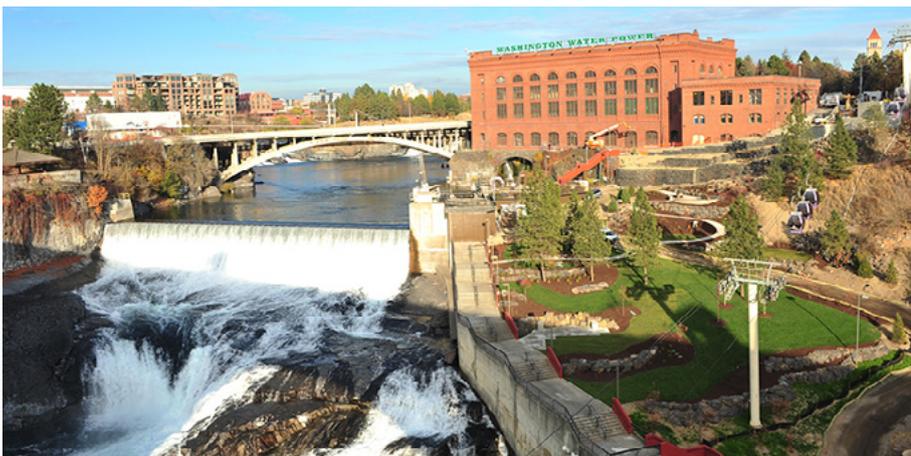
Making a Fast Solution Even Faster

Avista already had a powerful model in the form of their ADSS— but once they started running it with Gurobi, they saw even more significant time and cost

savings. With less time spent calculating, their operators and traders improved their efficiency and were able to get more work done.

“Gurobi is certainly cost-competitive, and it gives you the best chance of solving your hardest problems,” said Kalich. “Once you’ve gotten beyond some type of conceptual model, I think your best bet is taking a shot at Gurobi.”

In the future, Avista plans to explore how they could apply Gurobi to distributed generation and to the scheduling of their crews.



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