

Avista Leverages UtilityAI to Boost EV Intelligence, Behind-the-Meter Segmentation and Targeting, and DER Grid Management

A Case Story



Since Avista began its Advanced Metering Infrastructure (AMI) deployment, it has sought to leverage sophisticated load disaggregation to inform grid analytics, improve business profitability, and enhance customer engagement and experience by enabling a better understanding of household energy use.

Avista recognizes that embracing behind-the-meter data is the most powerful way for utilities to remain agile in today's dynamic energy landscape. The utility is leveraging the Bidgely UtilityAI™ Analytics Workbench application across operational areas, with a particular focus on three use cases: EV intelligence, behind-the-meter segmentation and targeting, and DER grid management.

ELECTRIC VEHICLE (EV) INTELLIGENCE

Having made the investment in AMI infrastructure, Avista already had all the necessary inputs at its fingertips to manage EV growth on its grid. The tools that Analytics Workbench provides allows the utility to detect EVs efficiently and accurately, and reveal essential EV insights from within each customer's total raw energy consumption profile.

With the world's most sophisticated EV disaggregation capabilities, Bidgely's UtilityAI is able to identify which customers own EVs and unlock important insights regarding when a customer charges their EV, detailed demand and energy profiles over time, charging frequency, average charging session duration, and more — all available on demand to Avista analysts.

Avista currently models EV charging load profiles based on in-house AMI disaggregation methodologies. While insightful, these methods are limited to known EV customers participating in utility programs, in some cases do not provide detailed load profiling with a known degree of accuracy, and require significant engineering and analytical effort. The advanced capabilities built into Analytics Workbench will allow Avista to build more robust load profiles at scale, with less effort and deeper insights to customer charging behaviors, feasible load-shifting strategies, and intelligent system planning for grid infrastructure to handle future EV loads based on the following capabilities:



Detect EV owners with high accuracy



Document year-over-year EV growth at the feeder level



Discover individual customer charging habits – i.e., which customers charge their vehicles according to a consistent pattern and which do so more sporadically



Understand how typical customer demand curves change with the adoption of an EV – i.e., whether owning an EV translates into greater peak demand, and to what degree on a granular geospatial level



Validate localized EV adoption concentrations, also known as “clustering” effects

This EV intelligence has the potential to improve grid planning. By providing accurate year-over-year, feeder-specific EV growth rates, the Grid Planning Team will be able to understand what infrastructure will require hardening or an upgrade in the coming years. These insights empower the utility to strategically harden their grid in high EV adoption areas while avoiding unnecessary infrastructure upgrades on feeders with low EV growth. Similarly, Avista’s economists will be able to leverage Bidgely-powered EV analytics to forecast organizational-level EV growth and predict systemwide power supply needs.

Active load management is another critical initiative. While time-of-use (TOU) rates may be effective in shifting some charging from peak to off-peak hours, Avista is interested in further shifting EV charging loads by leveraging UtilityAI capabilities. In addition to shifting a greater percentage of load to off-peak, Bidgely’s energy insights may be used to identify charging duration by customer and stagger charging to optimize supply and demand (i.e., Customer A charging from 4:00am to 8:00 am, Customer B charging from 12:00 am to 10:00 am). In addition, the development of detection and load management of medium and heavy-duty EV charging by commercial fleet customers is expected to become increasingly important for optimal grid planning and capacity investments to meet future, beneficial EV demands on the grid.



BEHIND-THE-METER SEGMENTATION AND TARGETING for Heat Pump Adoption

In the same way that behind-the-meter EV intelligence is enabling Avista to better manage EV growth in its territory, appliance-level disaggregation and behind-the-meter segmentation is also informing the efforts of the utility’s System Planning, Product & Services, and Engineering departments to test innovative load management solutions.

As an example, Avista is creating a connected community or “smart neighborhood” in downtown Spokane as a test bed for innovative load management solutions and program designs.

Leveraging Analytics Workbench tools, Avista is able to segment customers served by its test bed substation and the associated 8 feeders, and accurately identify individual household heating and cooling loads and hourly usage during substation peaks, as well as the aggregate loads on feeders.

With this intelligence, Avista has been able to identify:



Those customers with the highest peak heating and cooling

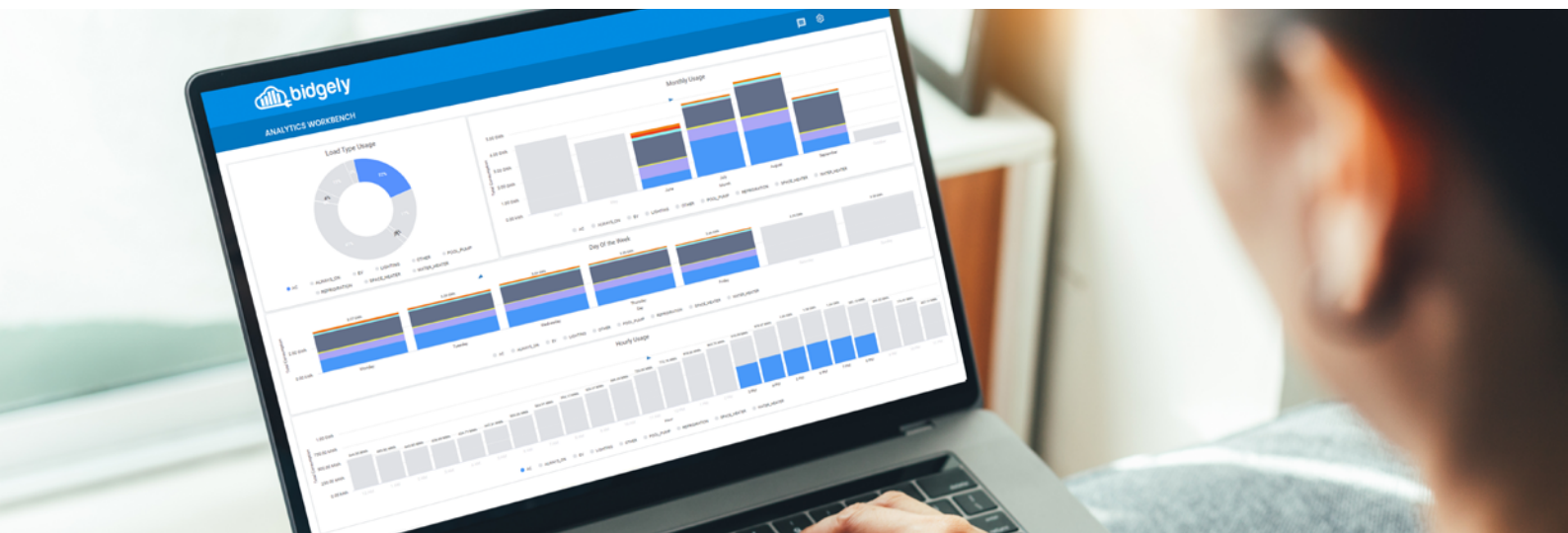


Those who have degraded HVAC equipment



Customers in those segments who are therefore prime candidates for a heat pump adoption program

The project provides Avista the ability to dispatch customer assets to improve grid utilization without compromising customer needs and comfort. The project will combine utility assets and customer devices behind the meter to meet the project goal of achieving at least 1 MW of demand flexibility. The project pilot needs to recruit about 100 customers of varying backgrounds, equipment, and electric usage to meet the project goals.



DISTRIBUTED ENERGY RESOURCES GRID PLANNING

The rapid expansion of distributed energy resources (DERs) presents utilities with new challenges and opportunities.

Bidgely is helping Avista understand:



How an increase in DERs would impact its existing feeder mapping



Whether it could withstand additional DERs



If the utility should consider reconfiguration

This grid visualization is enabling Avista to decide if certain customer sets should be moved to a different feeder to optimize that operation, saving the utility from wasting time and money on potentially unnecessary infrastructure upgrades



ALWAYS LOOKING FORWARD

According to Avista, UtilityAI and its Analytics Workbench have acted as a use case generator for the utility. As departments share information and data-driven discoveries, it inspires new questions and prompts the rethinking of legacy problems with new approaches.

Gone are the days when different operational areas would pull the data they required through discrete channels, resulting in different data sets and assumptions. Today, there is a culture of knowledge sharing, where teams from many departments are working with a uniform data set serving as a single source of truth. As a result, they can more easily tie together research and learnings from one department to another.

The UtilityAI Analytics Workbench provides Avista with a central data repository that is easily accessed through a user-friendly interface. Data is instantaneously available to all users and doesn't require an internal model or dataset to run in order to pull the information of interest. For simple queries that take an average of eight hours to complete, Bidgely empowers teams to complete the same analysis in ~20 minutes. For complex queries that might take 100+ hours to complete, UtilityAI Analytics Workbench typically cuts that time to four hours or less. Plus, the analytics that are produced can be used repeatedly from one program to another, year over year, with consistent output.

Avista and Bidgely continue to hold bi-weekly working sessions to brainstorm new use cases and explore how to capture more value from behind-the-meter data to address the industry's greatest challenges.



Learn more at:

www.bidgely.com/solutions/enterprise-analytics-workbench

See our analytics in action in our Demo Portal:

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