

SOLUTION AT A GLANCE: BOSTON'S ENERGY DATA OPTIMIZATION PROCESS - DASHBOARDS, UTILITY BILL VERIFICATION, AND OPEN DATA

SECTOR

Local Government

BARRIER

Using data (or technologies) to track progress, Getting access to data and information, Metering/measuring energy use

TOOL TYPE

Energy Management Program

BUILDING TYPE

K-12 schools, Government office, Other, Public gathering space, Public order and safety

TECHNOLOGY

Energy Management Systems, Combined Heat and Power System

OVERVIEW

The City of Boston pays bills for nearly 4,000 utility accounts across more than a dozen different municipal departments. With so many accounts across a wide range of stakeholders, it was difficult to verify the accuracy of charges and accountability was largely dispersed to the individual city departments. Boston had also been experimenting with various ways to leverage more granular or real-time data through a number of pilot initiatives, but no consistent process emerged. To improve the city's energy management process, Boston implemented a programmatic overhaul to how energy data was collected, analyzed, and reported. Boston incorporated a blend of in-house and outsourced strategies to optimize resources and staff availability. The program results have been immensely successful thus far, providing customized real-time energy meter dashboards to public building engineers, enhancing transparency and accountability through Boston's open data portal, and recovering over \$1.2M in identified utility billing errors in the first year of the outsourced bill verification contract.

Details

During the procurement process of an “enterprise energy management system” (EEMS), the City of Boston identified a savings opportunity by using existing assets and staff to complete a portion of the scope of work, while outsourcing specialized tasks to third-party contractors. The original bid solicitation requested proposals for monthly bill verification services, as well as real-time meter dashboard services. Procurement rules required Boston to first evaluate and rank vendor’s technical proposals. After this ranking, Boston opened the price proposals for all vendors. Since Boston asked for a detailed breakdown of pricing for each part of the scope of work, these bids provided insight regarding the value of various components to the requested services. Monthly bill verification services were generally consistent in pricing and within the range Boston had budgeted for, but real-time dashboard services had a wide range of proposed methods and pricing structures. Some vendors were willing to work with third party metering, while others proposed installing new, proprietary hardware that came with monthly hosting fees. Nearly all proposed methods resulted in pricing that would either exceed budget or reduce funds available for other components of the requested scope of work.

While Boston’s Department of Environment was the issuing agency of the RFP, members of both the city’s Department of Innovation and Technology (DoIT) and Auditing departments provided input for the scope of work and were part of the evaluation committee charged with selecting the vendor. This diverse committee was able to inform the procurement by taking into account a more holistic assessment of Boston’s energy data needs. Due to the inherent complexity of utility tariffs, and lack of specialization and bandwidth in Boston’s Auditing Department to review monthly charges for over 4,000 accounts, the committee placed higher weight on the needs of bill verification services. Boston elected to outsource utility billing verification to a vendor and energy specialist. This vendor would also send that same data to ENERGY STAR® Portfolio Manager® monthly to help the city comply with its Building Energy Reporting and Disclosure Ordinance, and participate in voluntary reporting programs, such as the Department of Energy’s Better Buildings Challenge. Recognizing that Boston already had existing licenses to a dashboard and data visualization software, the Department of Environment and DoIT collaborated to build out the cost structure for delivering customized dashboards in-house using existing resources. Boston’s Chief of Environment, Energy and Open Spaces and Chief Technology Officer both approved the hybrid in-house/outsourced solution for energy data management.

Results

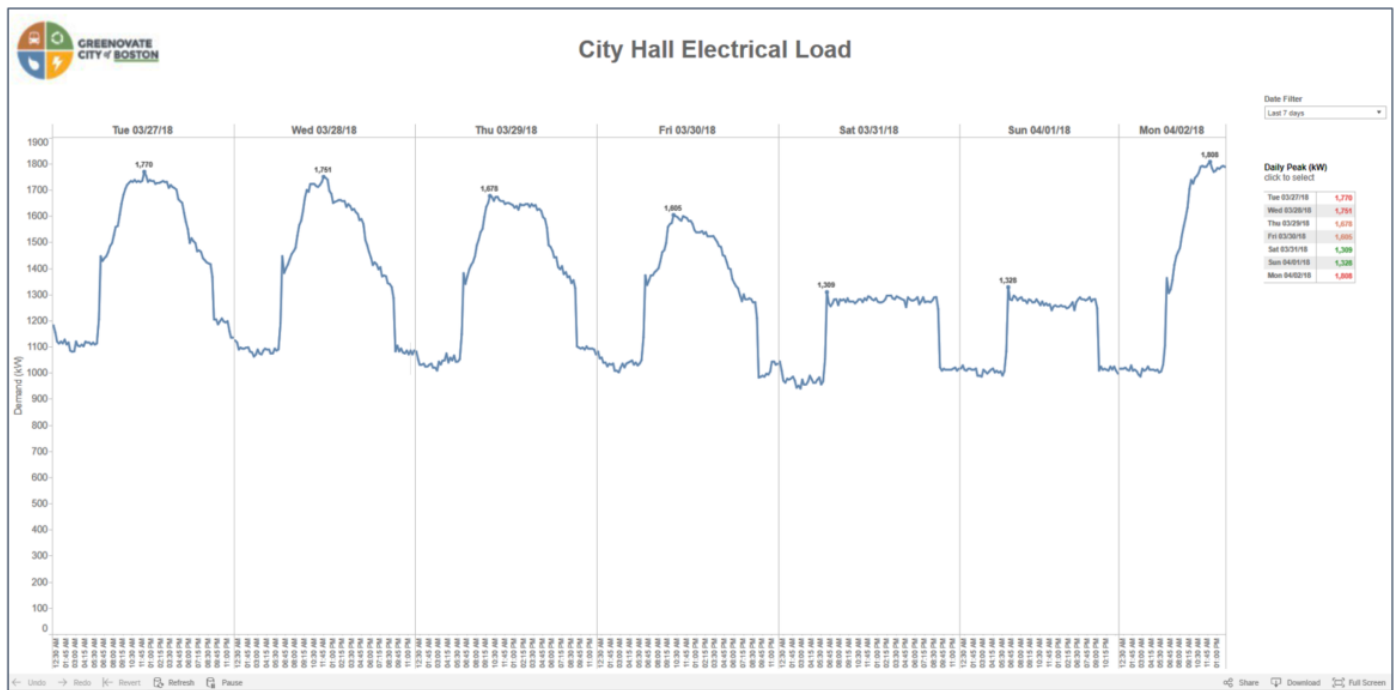
Outsourcing the monthly bill verification process has been a resounding success. The contractor has identified multiple billing errors in Boston’s utility distribution and supply charges, which in total exceed \$1.2 million. These errors were documented, disputed, and ultimately refunded to the city, providing a 400 percent return on investment in these services in just the first of a three-year contract.

In addition to financial gains of outsourcing bill verification, this freed up Boston’s energy manager and facilities staff to focus more on managing buildings. Although Boston previously had access to real-time interval data for some of the city’s largest facilities and an entire fleet of combined heat and power (CHP) generators, the data was yet to be fully leveraged. It was cached within multiple third-party software tools that required login credentials and navigating through a series of menus and off-the-shelf reports to retrieve information. To improve data accessibility, the city’s energy

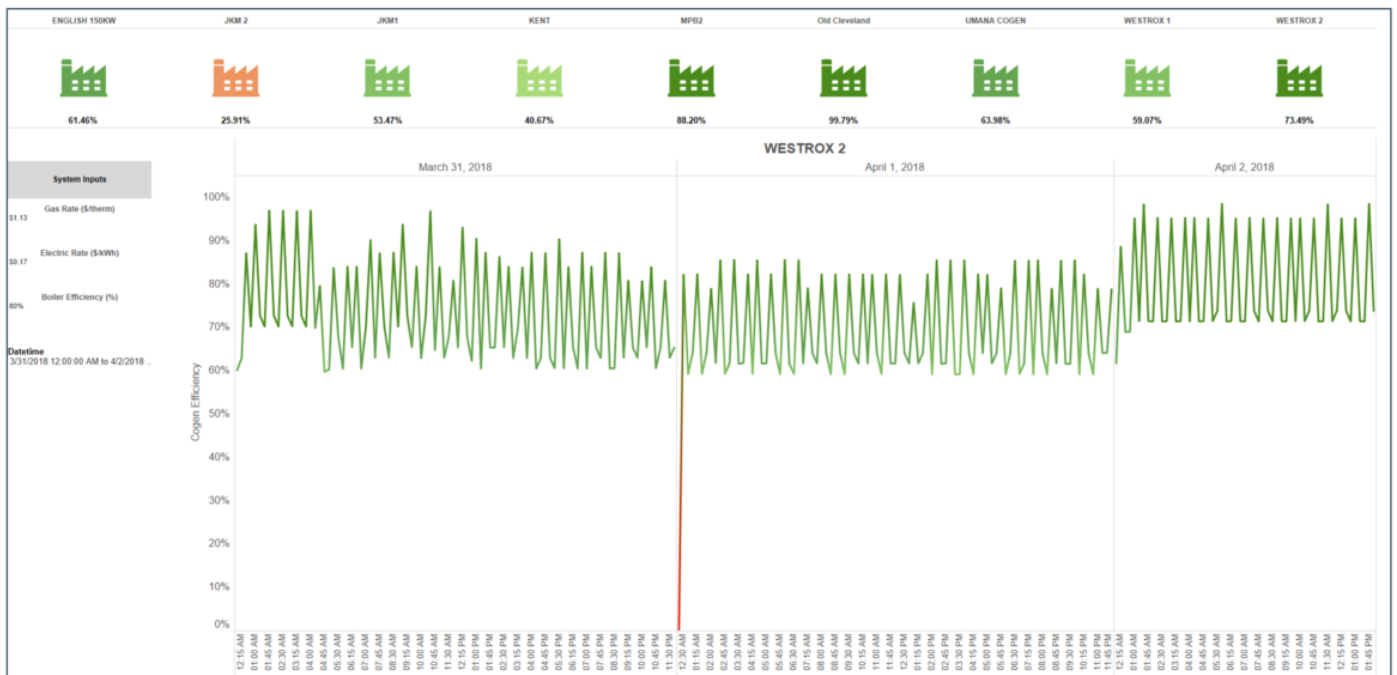
manager worked with the DoIT to bring these dispersed data sets into an internal server environment, where it could be viewed through custom-built dashboards optimized for desktop or mobile device. Rather than using pre-built reports, the energy manager worked with the facilities teams to build a tool that met their needs, while cutting out noise and unnecessary barriers. They singled out only what information was critical to operations and assembled dashboards with pre-embedded credentials. Rather than memorizing passwords and navigating a complicated user interface, the building engineers simply follow a link to a dashboard they helped design. By giving them some ownership of the process, the building engineers are more likely to use the tool.

Now, when the Chief Building Engineer at City Hall wants to know the exact timing of City Hall's monthly demand peak, he can check his desktop dashboard. If the Superintendent of Libraries has a day off when he gets notified of a demand response dispatch, he can make sure his staff is following their energy reduction protocol using his mobile dashboard. And when Boston begins to thaw from a long, cold winter, the School Department's facilities teams use real-time modeling to decide if and when it is more economical for them to shut down their CHP units for the season. By making all of this data available to the public via Boston's open data portal (Analyze Boston), city staff can leverage the knowledge and expertise of Boston's civically engaged academic and business communities.

Desktop Dashboard



Real-time Modeling



ANALYZE BOSTON DATASETS NEWS TIPS LOG IN SIGN UP

Welcome to
ANALYZE BOSTON

Analyze Boston is the City of Boston's open data hub. We invite you to explore our datasets, read about us, or see our tips for users.

Search from 134 Datasets

ANALYZE BOSTON DATASETS NEWS TIPS LOG IN SIGN UP

Home > Organizations > Environment Department

ENVIRONMENT DEPARTMENT
We prompt citywide climate action and work with communities to best prepare all Bostonians for the effects of climate change. We also work to protect our built and natural... [read more](#)

Followers: 0 Datasets: 5

ORGANIZATIONS (5)

- Environment Department (5)

TOPICS (3)

- Environment (3)
- Public Property (2)

Datasets Activity Stream About

Search datasets...

5 DATASETS FOUND

ORDER BY: Relevance

- Central Library Electricity Usage**
Electric power load at Boston Public Library's Central Branch (700 Boylston Street, in Copley Square) measured every five minutes.
Modified on April 2, 2018
684 total views
[CSV](#)
- City Hall Electricity Usage**
Electric power load at City Hall (1 City Hall Square) measured every 15 minutes.
Modified on April 2, 2018
387 total views
[CSV](#)
- City of Boston Utility Data**
Monthly utility data for all City of Boston accounts. This data comes from Boston's Enterprise Energy Management System. This software tool serves as the system of record for...
Modified on April 1, 2018
269 total views
[CSV](#) [PDF](#)