



How Real-Time Data Analytics Can Reduce Energy Costs, Improving Sustainability

A look at data-driven decision-making, including 3 ways your business can use data to improve energy management.

Every day, humans generate some 2.5 quintillion bytes of data (that's got 18 zeros).¹ The data explosion of the 21st century isn't just a massive sea of information; it's a tool — for business leaders who know how to use it.

The accessibility of data (and technological advances that allow businesses to leverage it) has drastically changed the way business is done today. Consider the shift from periodic shareholder reports to real-time dashboards visible to every employee who wants to look. Data and data analytics are now deeply embedded in most facets of the way successful companies and facilities operate. And successful they are: Studies show data-driven organizations are more likely to report improvements in decision-making and performance.²

Interestingly, increased data-driven analytics and strategies can do more than improve KPIs. The strategic use of real-time data analytics and AI can also improve energy use and facility management, increasing efficiency and saving money.

With PECO Ways to Save, businesses that leverage real-time energy management (RTEM) tools, AI-led advanced controls and data-based energy assessments have found improved energy efficiency, lowered energy costs and increased sustainability efforts as a result. The opportunity is a massive one, since more than 75% of all commercial buildings in the U.S. have not yet adopted data-driven energy management technologies like building sensors and control systems.³

Commercial facilities that aren't yet "online" are missing out on the opportunity to collect data that drives better decisions on cost savings, avoided downtime and more.



Data-Driven Decision Making

Studies show more than half of Americans rely on their “gut” to make decisions, even when presented with evidence to the contrary.⁴ But data-driven decision-making, or “DDDM”, uses data to inform and validate a course of action before committing to it.⁵ Whether DDDM applies to user testing and survey responses or real-time data dashboards, firms have realized the approach’s clear advantages. In fact, a recent survey showed a high percentage of leaders (69%) said “nearly all” or “most” of their decisions were driven by data. Looking ahead, 90% of responders thought that data would become “more important” to their businesses in the next 12 months. When asked what benefits DDDM provided, top answers included improved business agility, more automated business processes, improved products and services, and increased sales.⁶

How Data and Energy Consumption Intersect at Commercial Facilities

The same principles of DDDM can be applied to energy use, helping businesses make informed decisions about when, where and how to optimize their facilities to lower operational costs and boost sustainability efforts.

Energy is a significant operating expense for large businesses, with common inefficiencies that lead to waste and higher overhead costs. The U.S. Department of Energy estimates that 30% of the energy used in commercial buildings is wasted.⁷ Without access to real-time data, businesses often take this level of loss for granted, relying on outdated assumptions and reactive maintenance techniques (a.k.a. “run it until it breaks”) that keeps system downtime and lost revenue high.⁸ Even standard preventative maintenance techniques (akin to changing a car’s oil every 3,000 miles) fall far short of new data-based, predictive maintenance alternatives.

Leveraging the power of DDDM through sensors, real-time data dashboards and AI tools, these new energy management techniques proactively track data to identify an organization’s unique cost-saving and operations-improving opportunities.

Studies show how businesses that use both predictive and preventive maintenance are associated with 15% less downtime, 87% fewer equipment defects and 66% less inventory increases. Finally — and importantly — the use of modern maintenance methods decreased injuries and deaths per million employees.⁹

The Benefits of an Energy-Driven Strategy

Advanced data-driven decision-making technologies and AI make a big difference on an annual basis, reducing equipment downtime by up to 50% and lowering maintenance costs by 10 to 40%.¹⁰ But how exactly are these savings and reduced equipment downtime earned? Predictive maintenance with data-based technology involves a “digital-to-physical-to-digital” feedback loop. In this loop, sensors and tools within equipment capture data based on physical performance; then the machines talk to each other, sharing information to allow for advanced analytics in real time; finally, the tools apply algorithms and automation to make decisions about how the equipment operates — increasing efficiency and protecting against wear and tear.¹¹ In this way, advanced controls automatically adjust HVAC, lighting and other equipment systems in real time, lowering energy bills while doing an advanced job of, say, keeping a building comfortable for employees.

These data-driven technologies enable simpler and more accurate benchmarking and reporting, helping companies meet compliance requirements and ESG reporting goals (a worthy aim, since companies with strong ESG performance have 14% lower capital costs and outperform competitors financially¹²). Armed with invaluable data, leaders who adopt data-driven energy and sustainability strategies will be better equipped to navigate long-term economic and regulatory trends.

Opportunities loom large. A real-time flow of data and the ability to analyze it naturally allows for higher operational efficiencies and nimble performance. Other benefits include an “always-on” agility that minimizes harm during unexpected issues and a “connected community” of systems and assets whose efforts can be intelligently optimized with greater transparency and insight into performance than ever before.¹³

Key Opportunities to Collect Data on Energy Usage

There are three main opportunities for businesses to collect and leverage real-time data on energy usage.

1. Energy Assessments. A complimentary energy assessment identifies cost-saving opportunities, including how real-time data and analytics systems can improve efficiency, lower operating costs and upgrade equipment. Incentives are often available, and these opportunities can be identified during an assessment. If you're interested in a complimentary energy assessment, contact PECO Ways to Save.

2. Real-Time Energy Management Systems (RTEM). These management platforms are the "brain" of your smart facility, leveraging advanced sensors and cloud-based analytics to provide live insight into energy consumption patterns. With RTEM, businesses can use AI to detect inefficiencies, predict maintenance needs and automate energy savings.

3. Advanced Controls. Controls have come a long way from the invention of the modern thermostat at the turn of the 20th century. Today, advanced network communications and cloud-based computing allow managers to adjust a building's energy settings from their mobile devices halfway around the world. Smart automation means relieving facility managers of much of their

current responsibilities — advanced controls can adjust energy systems automatically to reach peak efficiency on their own. Thanks to state-of-the-art sensors and controls that optimize efficiency and diagnose wasteful equipment operation issues, advanced control upgrades save commercial businesses 29% in annual energy costs, on average.¹⁴

Data and Energy Management: A Powerful Duo

When companies embrace data-driven decision-making and advanced analytics to power their energy strategies, they can expect boosted operational efficiency, reduced costs and stronger ESG performance. It's not just about sustainability — DDDM and energy management provide a strategic advantage that drives shareholder value and improves long-term success.

▶ Visit peco.com/business/contact-us to connect with PECO Ways to Save and learn how you can start using data to drive your energy decisions.

¹ Domo. "Data Never Sleeps 5.0." Domo.com, 2017, www.domo.com/learn/infographic/data-never-sleeps-5. Accessed 27 March 2025.

² Stobierski, Tim. "The Advantages of Data-Driven Decisionmaking." Harvard Business School Online, 26 August 2019, online.hbs.edu/blog/post/data-driven-decision-making. Accessed 27 March 2025.

³ National Renewable Energy Laboratory. "Commercial Building Sensors and Controls Systems: Barriers, Drivers, and Costs." NREL, May 2022, www.nrel.gov/docs/fy22osti/82750.pdf. Accessed 3 April 2025.

⁴ Garrett, R. Kelly. "Should We Worry That Half of Americans Trust Their Gut to Tell Them What's True?" The Conversation, 27 September 2017, theconversation.com/should-we-worry-that-half-of-americans-trust-their-gut-to-tell-them-whats-true-84259. Accessed 27 March 2025.

⁵ Stobierski, Tim. "The Advantages of Data-Driven Decisionmaking." Harvard Business School Online, 26 August 2019, online.hbs.edu/blog/post/data-driven-decision-making. Accessed 27 March 2025.

⁶ Patience, Nick. "Firms Realize the Value of Data-Driven Decision Making." S&P Global, 10 June 2022, www.spglobal.com/market-intelligence/en/news-insights/research/firms-realize-the-value-of-data-driven-decision-making. Accessed 27 March 2025.

⁷ U.S. Department of Energy. "About the Commercial Buildings Integration Program." energy.gov, 2020, www.energy.gov/eere/buildings/about-commercial-buildings-integration-program. Accessed 27 March 2025.

⁸ Thomas, Douglas. "Research Suggests Significant Benefits to Investing In Advanced Machinery Maintenance." nist.gov, 15 June 2020, www.nist.gov/news-events/news/2020/06/research-suggests-significant-benefits-investing-advanced-machinery. Accessed 27 March 2025.

⁹ Thomas, Douglas. "Research Suggests Significant Benefits to Investing In Advanced Machinery Maintenance." nist.gov, 15 June 2020, www.nist.gov/news-events/news/2020/06/research-suggests-significant-benefits-investing-advanced-machinery. Accessed 27 March 2025.

¹⁰ Coleman, Chris. "Making Maintenance Smarter." deloitte.com, 9 May 2017, www2.deloitte.com/us/en/insights/focus/industry-4-0/using-predictive-technologies-for-asset-maintenance.html. Accessed 27 March 2025.

¹¹ Center for Integrated Research. The physical-to-digital-to-physical loop. 2021, www2.deloitte.com/content/dam/insights/us/articles/3828_Making-maintenance-smarter/figures/3828_fig2.png.

¹² Henisz, Witold. "5 Ways that ESG Creates Value." McKinsey.com, MCKinsey Quarterly, November 2019, www.mckinsey.com/~media/McKinsey/Business%20Functions/Strategy%20and%20Corporate%20Finance/Our%20Insights/Five%20ways%20that%20ESG%20creates%20value/Five-ways-that-ESG-creates-value.ashx. Accessed 27 March 2025.

¹³ Coleman, Chris. "Making Maintenance Smarter." deloitte.com, 9 May 2017, www2.deloitte.com/us/en/insights/focus/industry-4-0/using-predictive-technologies-for-asset-maintenance.html. Accessed 27 March 2025.

¹⁴ Fernandez, N., S. Katipamula, W. Wang, Y. Xie, M. Zhao, and C. Corbin. 2017. "Impacts of Commercial Building Controls on Energy Savings and Peak Load Reduction." Pacific Northwest National Laboratory, PNNL-25985.