Johnson Controls

OpenBlue
Net Zero Buildings

Achieving Zero Emissions By 2050

How to Comply with New Building Performance Standards Legislation Affordably

Building owners in the United States face an expanding set of priorities that now includes carbon emissions.

States and cities across the country are passing Building Performance Standards (BPS) laws that require building owners and managers to comply with specific sustainability metrics that reduces their carbon footprint, and laws in six jurisdictions are set to take effect by 2025: Denver, Boston, New York City, Washington DC, Chula Vista (CA), and St Louis. Experts expect other states and jurisdictions will also pass legislation in the near future. And most of them have set a deadline of 2050.

Given that new legislation varies by region and specific buildings, there is not a one-size-fits-all answer to BPS compliance. However, building owners everywhere will benefit from designing a plan that's both timely and cost-effective. To get there, they will need to partner with sustainability experts who know a lot about BPS.

"Building owners need tools to know where they stand and then start making improvements in their emissions today or in the near future," says Mark Lessans, Senior Director of Sustainability and Regulatory Affairs at Johnson Controls.

Net zero emissions required by milestone dates

Getting to net zero emissions within 30 years poses a significant challenge for many. Achieving net zero is not a project that takes a few weeks or even months. Instead, it requires incremental changes and systemic updates that touch multiple aspects of each building's structure and operation. This takes years to accomplish.

Most legislation also requires building owners to hit multiple milestones of dates requiring proof of emission reductions to show they are on the right trajectory in the years leading up to 2050. These policies allow building owners to begin the process at their current emission level, since energy efficiency tends to vary with the age of the building.

For example, an older building emits 10 tons per square foot, whereas its newer neighbor only emits 8 tons per square foot. In this case, the newer building would need to hit 6 tons per square foot while the older building is allowed to come in at 7.

Success depends on what happens today

Reaching each milestone for emissions reductions will be very time consuming. Additionally, experts predict that creating the initial design for a compliance plan can take one to three years per building. And some changes – such as those to the chiller and boiler – must be made within a 30-year cycle to reduce unnecessary expenses and waste. Building owners who do not start planning now could fail to catch up.

This is especially true for owners of commercial real estate since they cannot shut down a building full of tenants to finish each project. Owners must instead schedule work to minimize business disruptions while keeping an eye on costs and the milestone deadlines.

Building owners in states that currently do not have BPS legislation should also begin planning for meeting similar standards. By starting now owners can more easily and affordably meet the standards. Instead of making costly mistakes with routine maintenance and upgrades, owners can make decisions based on the goal of meeting the standards.

Some building owners are planning to wait until the multiple lawsuits surrounding BPS legislation are resolved in court. This is not advisable. No one knows how long the BPS litigation will drag on. If current BPS legislation is upheld, these owners may be too far behind to meet net zero emissions by 2050.

Paying the penalties instead of upgrading is likely a mistake

At first glance, paying penalties may appear cheaper than the cost of upgrading. However, the BPS will **require** lower emissions as time goes on. That means owners who pay the fines instead of upgrading will get stuck paying for the upgrades anyway, only at higher rates.

"The BPS is not something where you get a bill in the mail and pay it and then it goes away," says Lessans. "You have to figure out how to retrofit your space and then how to get the retrofit completed in time to start tracking your next set of emissions, which will have likely already started by the time you get the bill."

One exception is when building owners consciously decide to exceed emissions limit in the short term for the better overall results. For example, paying fines for 5 years and then replacing the chiller instead of replacing equipment that is in working order right now.

"What you do in 2023 sets you up to be successful in 2024 and then for 2025. If I am just writing checks to pay fines until 2029, it's going to be enormously difficult to make up for all that time in only a few years. Most building owners won't be able to make it," says John Steele, Senior Director of Government Relations at Johnson Controls.

Meeting BPS standards reduces energy costs

Adapting to BPS changes also significantly reduces energy costs. Building owners should factor in those savings when calculating their costs.

"Many building owners overlook that because you reduce energy consumption by complying, you are also spending less on energy costs," says Lessans. "While you might be avoiding a million dollars in fines, you are probably also saving $300,000 in energy costs. It's more than just protecting your reputation and avoiding fines – there is the sheer logic of saving money through energy efficiency."

Complying with BPS can enhance a buildings reputation

Over the last few years, businesses have touted new ESG and sustainability goals. BPS provides them an opportunity to prove to customers that these statements are more than empty promises.

That commitment to BPS will pay off as more customers factor environmental considerations into their investment decisions. For instance, business will be drawn to buildings with lower emissions rates. By contrast, they may refuse to work in a space that is not compliant with BPS.

4 actions building owners can take to address BPS today

1. **Think about multiple building systems as a whole.** While property owners often address the needs of one building system at a time, achieving BPS compliance requires understanding how all systems work together. Six or seven key components contribute to a building's carbon footprint, including heating, cooling, building controls, air flow, and water flow. Owners must also consider components that control how much energy stays in the building, such as roofs, insulation, windows, and building pressurization.

2. **Conduct an energy audit.** An energy audit can help buildings assess precisely what's needed for BPS compliance. A thorough audit would include reviewing the entire building, its mechanical systems, a entire and going over past utility bills. "If you don't know how much carbon you need to shed, then it's possible to spend a million dollars on upgrades but still not be where you need to be. You need to know where you are and where you need to be," says Paul Budlong, who oversees business development for HVAC at Johnsons Control.

3. **Design an overall plan to get to net zero emissions by 2050.** Without a long-term plan to reach compliance, building owners will make costly mistakes. For example, an owner may replace their building's older gas boiler with a newer, more efficient one. Then they discover that, in order to hit a 15-year target, that new boiler needs to be replaced with a heat pump.

4. **Look for funding.** States and municipalities will incentivize emissions reduction. For instance, some regions offer "property assessed clean energy loans" to pay for energy-efficient upgrades. Those upgrades increase the property's value. So rather requiring buildings to pay back loans annually or monthly, the state collects more in tax revenues. Additionally, there are energy-savings performance contracts in which, if the energy savings is not met, the company pays the difference to the customer.

How Johnson Controls can help

Johnson Controls works closely with building owners to develop an effective and cost-effective sustainability and resiliency program to comply with Building Performance Standards laws. We'll build your business case to meet your needs, and we'll help balance the traditional conflict between cost savings and investment. We offer a wide assortment of building systems that can help you reduce your facility's emissions.

As leaders in sustainability and net zero emissions, our approach brings together expertise with leading capability to deliver energy efficient outcomes through our building and infrastructure management services. We blend technical and operational expertise with our reputation for quality. After reviewing your goals and your facility, our team will advise on all aspects of ESG and sustainability to provide a comprehensive road map of actions and solutions to meet the milestones BPS legislation. Here's how we do it:

Step 1: Assess your facility.

We look at current and anticipated use to understand present energy usage, plan for energy needs, and review indoor air quality. We also make sure all your systems are right-sized for your facility, which is essential for efficient operation.

Step 2: Help build your business case.

Our team develops models specific to your equipment and facility, giving you a clear picture of potential efficiency gains and lifecycle cost improvements. We draw on our industry know-how to incorporate additional opportunities to optimize performance.

Step 3: Recommend next steps.

We lay out a step-by-step plan for you to modernize according to your goals and budget. We provide you with a menu of options and recommendations that make sense for your facility, and we include a range of smart technologies, such as tools to support predictive maintenance.

JCI uses the following products to help building owners meet BPS legislation requirements:

HVAC Equipment and Hydronic Systems

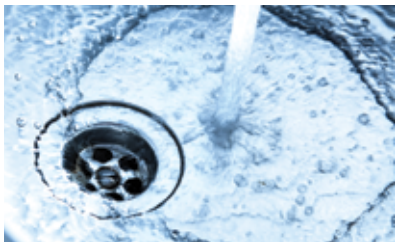
We offer the largest portfolio of HVAC equipment and controls in the world. With expertise in mechanical retrofitting existing systems, our team performs audits of the current equipment and identifies deficiencies that prevent you from meeting regulations and best practices in indoor air quality. From there, our experts will design and recommend solutions to meet today's energy, decarbonization, and healthy buildings initiatives.

Building Automation Systems and Controls

Our next-generation building automation systems make it possible to extend automated control to every building system from a single platform. We make an entire line that ranges from simple, configurable controls to highly programmable automation systems for entire facilities.

Accessible Digital Tools

Our suite of tailored, AI-powered digital solutions optimizes building performance through predictive maintenance, remote diagnostics, emission management, goal and targets, and more. Our OpenBlue Enterprise Manager, for example, hosts a series of applications that enable energy management, carbon accounting, asset optimization, and advanced reporting. It can integrate through Metasys and third-party BMSs to deliver optimal building outcomes, ensuring compliance with building performance standards while also balancing comfort, air quality, costs and emissions.



Water Usage Reduction

We supply the expertise and funding mechanisms to provide businesses with water and energy conservation solutions. By helping decrease water leakage and operational costs, businesses may be able to reduce water consumption by up to 50%. Water heaters can be upgraded from fossil fuel fired to electric, or we can provide high efficiency or indirect options. Our experts are able calculate the most effective ways to reduce water usage in sinks and toilets.

Lighting

We partner with the world's premier lighting innovators to revolutionize interior and exterior lighting. Our experienced lighting engineers have designed and executed hundreds of millions of dollars in lighting projects around the world. By integrating lighting systems to work in conjunction with existing building systems, the result is a holistic system better suited for energy efficiency, convenience, and security. From clinics to classrooms, these intelligent lighting systems provide advantages well beyond energy savings to help buildings run more efficiently.

To learn more about how JCI can help you comply with BPS legislation, visit: https://www.johnsoncontrols.com/BPS