



WHITE PAPER

Turning Title 24 Regulations Into Smart Savings

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Forward-thinking organizations are viewing energy efficiency as an investment in business transformation, not just a way to cut operating costs for facilities management. Energy efficiency is about controlling costs and saving money, and helping to preserve the environment. That has to be central to any business' strategy.

In California, energy efficiency standards are set in the state's Code of Regulations Title 24. The California Energy Commission updated its Title 24 Energy Efficiency standards, requiring businesses to implement technologies that enable highly efficient and zero-net-energy buildings with systems that are integrated with advanced communications capabilities. CFOs, Operations Managers, Energy Managers, and Facilities Managers can no longer reject energy efficiency investments if they want their construction or renovation project to win a building permit.

With increasing scrutiny as environmental concerns intensify, it is imperative that building owners and corporations carefully consider their energy management and monitoring software solution to ensure their solution fully complies with all mandates and regulations which include automated demand response, plug load circuit control, daylighting, and multi-level lighting controls.

Of increasing importance to many organizations across industries is that the solution provides feature-rich software that is easy for facility managers to use and for heads of operations to gain real-time insights for continuous, long-term energy and operational savings. Facility managers, for example, need an integrated system for powerful controls and reports to illustrate energy usage and savings. Top-level executives at all businesses need to view their company's entire building portfolio, identify under performing facilities and use actionable information to optimize energy and operational efficiencies while reducing environmental impacts.

A well-designed, tightly integrated energy management system is a valuable ally to an organization's efforts to comply with energy efficiency standards now and well into the future, providing executives control and insight for continuous operational optimization. Yet an isolated solution, one that cannot be leveraged for an adjacent energy cost saving opportunity, can produce the opposite result, adding more complexity and cost to the process.

Since energy efficiency is critical to business operations, it is vital that an energy management and monitoring solution, while saving money and increasing productivity, also helps to ensure compliance with all the regulations that govern your industry and business. When selecting an energy management solution, invest in building-wide solutions that provide a common platform for reducing overall energy spend on lighting, HVAC, and plug loads.

California Title 24 – A Catalyst For Change

The California Energy Commission is the state's primary energy policy and planning agency, responsible for promoting energy efficiency and conservation by setting California's building efficiency standards. The standards ensure that better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption are installed in businesses. The new standards, which took effect July 1, 2014, introduced advanced lighting controls and plug load management, and applied demand response capability much more broadly, making real-time energy management and insights the new standard in California.

The new standards are also more stringent, lowering the threshold for when alterations must comply with standards and allowing fewer exceptions. For example, the current version of Title 24 requires lighting alterations to comply with when 10% of the luminaires are replaced by the previous Title 24 version.

Real-time energy management and insight – having the ability to respond dynamically to changes in occupancy, daylighting, personal and institutional tuning, and the network—is the largest opportunity for energy savings in commercial buildings.

Since 1977, the California Energy Commission has helped save Californians \$74 billion in electricity and natural gas savings. Historically, California has been at the forefront of building efficiency policy, leading the nation in establishing energy efficiency standards, as well as increasing those standards.

Title 24 helps the state meet its ambitious energy and climate goals as directed by several state energy policies. These include the Loading Order policy, which specifies that California's growing demand must first be met with cost-effective energy efficiency, followed by demand response, and then electricity generation from renewable energy resources. . Other policies include the Zero Net Energy goal for commercial buildings by 2030; Governor Brown's Executive Order on Green Buildings; the Green Building Standards Code, and AB32 Global Warming Act, which mandates that California reduces its greenhouse gas emissions to 1990 levels by 2020 (33% reduction).

The Zero Net Energy goal directs new buildings to use a combination of improved efficiency and distributed renewable energy generation to meet 100 percent of their annual energy need. Since commercial and industrial buildings account for over 40 percent of California's energy usage, the building-wide use of controls is vital to meeting the Zero Net goal.

An important takeaway with Title 24 is that energy efficiency is more than just putting LED lighting or other energy efficient equipment into buildings. Energy efficiency is about controlling all energy loads cost-effectively – this requires networked controls. The most viable strategy for compliance with Title 24 now and in the future is an integrated networked control solution that brings all lighting, HVAC, and plug loads under a single, unified platform, with connectivity to the Internet of Things.

Ensuring Compliance – Demand Responsive Controls

The evolution of demand response (DR) mirrors the evolution of the larger building automation industry. Historically, demand response has been implemented manually, where a person physically adjusts or shuts down energy load after receiving notifications of an upcoming demand response event by phone, fax, and e-mail messages. This method is typically not cost-effective and highly inefficient, producing inconsistent results.

DR is an important part of an overall building energy efficiency plan as it allows businesses to temporarily reduce their electric load on the grid when extreme weather or supply constraints can cause grid instability, which usually results in blackouts. Power outages aren't just inconvenient; they translate into millions in lost revenue.

With this requirement, DR is moving toward full automation, where a networked building control system can receive notification of forthcoming demand response events through a secure Internet connection with a central demand response server and dynamically execute specific load-reducing actions without human intervention, delivering efficient and consistent results.

Demand Responsive Lighting and HVAC Controls

One of the biggest changes to the lighting standards for commercial buildings relates to the demand-response capability. The new code requires all commercial buildings over 10,000 square feet to have automated demand response capabilities in their lighting systems regardless of space type. This lighting control system must be capable of receiving and automatically responding to standards-based messaging, such as Open ADR, to reduce lighting power by at least 15% below the building's maximum lighting power during peak demand times.

New to the 2014 version of Title 24 is the requirement for all thermostats to have the capability to respond to demand response signals over the Internet through automatic set point adjustment. These thermostats must have network access for connectivity with the Smart Grid.

As continued response toward highly efficient, fully connected buildings is increasingly important, organizations must ensure demand response capability is embedded in their energy management and monitoring system, and this capability includes both lighting and HVAC controls. Demand Responsive Lighting and HVAC Controls

Ensuring Compliance – Plug Load Control

Office plug loads and task lighting are now the largest power density loads in most office buildings with office equipment being the third highest contributor to electricity usage in California buildings. This electricity use will continue to increase as more personal computers and other electronics are introduced into office spaces.

The Title 24 code requires that 50 percent of outlets in certain space types are controlled. These controlled receptacles must automatically shut off the devices that are plugged into them when the area is not occupied.

Increasingly, energy management and monitoring solutions are incorporating plug load control. It's important that facilities professionals who use smart energy management technology for lighting and HVAC controls leverage the solution's capability to reduce plug loads and better manage energy usage.

As smart energy management becomes prevalent, we will see the emergence of more uses of more comprehensive energy management solution – one that does lighting, HVAC, plug load, and more as organizations streamline energy and operational efficiencies.

Ensuring Compliance-Lighting Controls

The requirements for controls have increased in granularity, now requiring either continuous dimming or three intermediate levels between on and off settings while maintaining a uniform level of illumination. Multi-level controls allow energy cost savings and occupant safety to be achieved in situations where a complete shut-off would be unacceptable – for instance, in aisle ways and open areas in warehouses.

The Title 24 introduced the requirements for occupant sensors and photo sensors, making more use of occupant sensing and natural lights to lower daylight harvesting consumption. Occupant sensing control is the most common and effective strategy, and when used alone reduces energy waste and costs by 35%-45%. Combined with photo sensor control and multi-level lighting controls, an organization can realize significant energy savings. As building standards become more stringent, it's crucial that the energy management technology in use is flexible – having the ability to adapt to dynamic changes in any building application.

While standalone legacy lighting systems try to add on capabilities, these systems will no longer be sufficient to meet building codes. More advanced building networking technology built from day one that incorporates occupant sensing control, photosensor control, multi-level lighting control, and now demand response in the design of the energy management system is capable of tackling new energy cost saving opportunities.

Planning A Successful Energy Efficiency Strategy

As new technologies such smart wireless energy management gain market momentum, building codes are recognizing the importance of a network that can bring all aspects of building energy efficiency under a single, unified system. Many of the new regulatory requirements are interconnected, forcing CFOs to invest in technology that provides a common platform for demonstrating compliance across lighting, plug load, and HVAC systems. With a tightly integrated networked solution, complex regulatory requirements are turned into actionable and simple-to-implement building control best practices.

Invest In Standards-Based Interoperable Solutions

Organizations have the choice of standards-based or proprietary energy management solutions. Proprietary systems lock corporations into exclusive partnerships and expensive upgrades to get the optimum value. Standards-based solutions give facilities professionals the choice to use a variety of products, and there are more third-party products available. Standards-based solutions are typically less costly to implement and support. Look for ZigBee standard wireless technology to help ensure the viability and longevity of your technology investments into the future.

Avoid Technology Silos For The Future

As regulatory standards become more stringent and complex, it's important to develop an energy efficiency strategy that simplifies the compliance and operations. Energy efficiency needs to be viewed as a facilities management and IT investment that helps optimize building operations. What to avoid is disparate systems that cannot interoperate and therefore cannot be leveraged for adjacent energy cost saving opportunities. Smart Energy Management: Bottom-line Benefits

Smart energy management can be a strategic investment for business transformation, enabling organizations to significantly reduce energy costs and save money, increase productivity and comfort for employees, preserve our natural resources, and achieve compliance with regulatory standards. Standards-based energy management solutions designed with connectivity are easily customized to address additional business and regulatory needs across various energy sources.

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