



How developers can build green, stay cost-efficient and elevate safety

The right technology can ensure heightened health and wellness of building construction crews and facility users at every stage of development.

Developers have been working to incorporate healthier, cost-efficient green building solutions into their projects, which includes more stringent requirements to safeguard construction crews, as well as building occupants and visitors. The new landscape also consists of factors related to fewer people working at and visiting buildings and other facilities, new restaurant layouts requiring better ventilation and temperature checks upon entry, and a heightened need for cost-saving modular construction techniques.

The occupancy issue is a major concern. A June 2020 online survey from 451 Research⁽¹⁾ laid out a challenging scenario, according to 575 IT end-user decision-makers. It revealed that 47 percent of the companies queried

expected to reduce office space, with a significant number intending to do so by more than 25 percent. Moreover, 67 percent of these organizations saw the expanded or universal work-from-home policies they launched during the pandemic becoming permanent.

This impacts affects a developer's ability to launch new projects and keep current ones moving forward, especially is they are lacking in support from industry partners. A supplier-partner like Mitsubishi Electric

Business Solutions—which brings with it multiple perspectives and technologies—can ease the pain through collaboration and the practical application of technological solutions, with the outcome of being a reduced total cost of ownership. What is more, Mitsubishi Electric has operations in numerous countries, each having its own standards and practices, so the best solutions that emerge in one market can be picked up and applied elsewhere.

A global supplier-partner brings multiple perspectives and technologies, and best practices from multiple markets

Safety as a prime concern

Michael Owen—a Tokyo-based consultant for international real estate developers who interacts with decision-makers across a broad swath of the construction and development sector⁽²⁾—believes that ensuring safety is a fundamental issue. “Sensors will play a major role in safety,” he said. “With office buildings, the surfaces must be sterilized, so that, for example, when you choose your floor you don’t worry about contaminating yourself.”

A commitment to safety through technology and new best practices communicates “safety first”

In Japan, even simple solutions are being applied, such as in restrooms where sensors automatically dispense soap and water and using QR codes and a smartphone app eliminate the need to touch elevator buttons.

More high-tech solutions are also on the market there, including Mitsubishi Electric’s Hygienic Touch Operable Aerial Display, which allows users to indicate destination floors with no need to touch a button. It uses retroreflective high-resolution aerial image display technology combined with sensors to determine the spatial position of the hand in mid-air, so users can intuitively operate a virtual touch panel.

Safety at worksites is also a key issue. A commitment to safety through technology and new best practices communicates “safety first” to development project workers, which in turn, leads to more efficient operations at worksites. “If you can ensure an environment where workers are treated well and feel safe, then the system can function as efficiently as intended,” Owen said.

Security through technology

From his perspective as someone who tracks industry trends in Japan as well as multiple markets worldwide, Michael Owen sees the

solution to ensuring the health and welfare of building users as a combination of automated systems, better air circulation, and the use of technology during development to increase efficiency.

“Obviously, monitoring temperatures and washing hands and cleaning surfaces is important,” he said. “What that means for a building company, though, is providing structures with sensors that can measure five to ten people simultaneously. These sensors already exist. If a powerful sensor can be installed in office and restaurant entrances that flags people if they have a high temperature, it can provide a high degree of security,” he said.

A digital twin—or virtual clone—of a building can save on operations costs through predictive maintenance. A system that mines the big data generated by a structure’s air conditioning, elevators, human traffic data and others can head problems off at the pass. Mitsubishi Electric can supply both software and hardware for such a scenario. For example, using IoT and the Maisart AI platform, technology called M’s BRIDGE features 24/7 remote monitoring of elevator operations and automatic failure detection. It also remotely analyzes data on failures and pinpoints causes in order to speed repairs⁽³⁾.



Buildings that breathe cleaner and more efficiently

Technological innovations are necessary to make building ventilation more effective. According to Joseph Allen, Associate Professor of Exposure Assessment Science at the Harvard Center for Green Buildings and Cities, most structures still use cheap filtration systems that catch less than 20 percent of virus-sized airborne particles. One U.S. report estimates that elevating ventilation to a new standard could be as effective in stemming airborne diseases as vaccinating half the building's population⁽⁴⁾.

Buildings erected seventy years ago and before have windows that open, allowing for quick and easy ventilation. Modern buildings, however, must rely on HVAC systems that can cope with more robust ventilation and filtration demands, which in turn enhances the sense of security. Moreover, state-of-the-art HVAC upgrades and new installs reduce energy consumption. The primary goal is an optimized balance of technology that works without unscheduled downtime and levels of energy efficiency that keep power usage costs to the absolute minimum.

According to Carl Ian Graham, P.E., of Viridian Energy & Environmental, Inc., HVAC systems use an average of 39 percent of the energy a commercial building consumes, and a high-performance HVAC system can save 10 to 40 percent of energy, emissions and costs, while total building design and systems can combine to potentially boost those savings up to 70 percent⁽⁵⁾.

Improved comfort and thermal control are also essential to indoor environmental quality (IEQ) and a positive tenant experience. A key HVAC technology for ensuring that is variable refrigerant cooling (VRF), which provides energy-efficient comfort control according to the conditioning needs of a building's zones. Each VRF system is equipped with an inverter-driven compressor designed to vary its speed and capacity to match the heating or cooling load of a specific space at any particular time.

While conventional HVAC systems run at full speed and capacity regardless of the actual



load, VRF systems save money by modulating refrigerant flow and using only the precise amount of electricity required to maintain the set point. VRF systems are also ideal for applications that use renewable energy, and essential for initiatives dedicated to lowering CO₂ emissions.

Mitsubishi Electric's Lossnay ventilation system has been developed and refined over the past three decades to recover waste energy.

Lossnay units reduce overall energy costs by extracting stale air and recovering the heating or cooling energy to either warm or cool incoming fresh air. Lossnay can save up to 30 percent on the initial capital costs of a heating and cooling system⁽⁶⁾.

Improved comfort and thermal control are essential to indoor environmental quality (IEQ)

Creating efficiencies through people

How developers in Japan get things done can be highly instructive. Automation, meticulous scheduling, worker redundancy, and a strong group dynamic are characteristic strengths there, according to Michael Owen. "Most Japanese construction jobs are finished on time, but some are purposely delayed by a few months," he said. "They still have the expectation that things are done on time, but for developers, things done in a timely manner require more efficiency."



One-stop solutions bring added efficiencies

Partnering with a one-stop solutions provider like Mitsubishi Electric Building Solutions boosts efficiency and cuts costs just as the total building approach does. Garrison Beall, the commercial director of construction at network solutions provider Edgcore Networks, says he chose Mitsubishi Electric for the first of seven buildings of the company's data center for quality and cost reasons. "We needed a home run, a company that we and our customers knew we could rely on to provide good customer service and good, cost-effective solutions," he said. "Mitsubishi Electric provided the UPS, the elevators and HVAC systems. We went with the Citi Multi VRF system—four units to cool a 40,000-square-foot space."

Edgcore relies on the UPS to ensure critical power for its tenants, and robust elevators that can handle loads weighing up to 3,000 pounds. "It's just amazing technology," Beall said. "We don't have to worry about the day-to-day operation of the building itself. And having a single point of contact really makes my job easier⁽⁷⁾."

Having essential crew members out sick can wreak havoc on production schedules. Owen has observed that better scheduling of the working population, plus a shift system where a backup team is always ready, can pay off. "Most developers in Japan and probably three of the top five do this," he said. "They set up two or three teams with redundancy in each team, so if anybody on the first team goes down the second team can replace them. This is a concept that hasn't been fully embraced overseas."

Automation can ensure that the workforce stays healthy. "That really comes down to controlling circumstances around the workers, such as reducing the number of people at the worksite as much as possible," Owen said.

Partnering with a one-stop solutions provider boosts efficiency and cuts costs

Mitsubishi Electric goes far beyond the supply of proven green building technology and AI software for sustainable structures with long-term value. Partnering with the company brings vast expertise to the pre-development phase as well as quick, tailored after-service in the rare event that anything goes wrong. And since the effects of extreme weather, a major disaster or a pandemic on a supply chain can cause critical shortages, having the connection to the Mitsubishi Electric Building Solutions network is a partnership that creates value on an ongoing basis.

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