

SMART BUILDINGS TECHNOLOGY

EXECUTIVE SUMMARY

Smart Buildings Balance Efficiency and Tenant Experience

Julie Petrone, Director of Marketing & Strategy, ABB Building Solutions, Americas - Electrification, Smart Buildings Division

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KEY TAKEAWAYS

- Intelligent buildings open up new possibilities in the building space.
- The functions available in smart buildings have evolved over time.
- Smart buildings support sustainability goals.
- Smart buildings contribute to better health.
- Return on Investment depends on more than just energy savings.
- Connectivity and converged infrastructure are critical to the future of smart buildings.

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OVERVIEW

New technologies redefine buildings from static environments to more dynamic and interactive spaces that impact the lives of their occupants. Technology advances based on data, intelligence, and learning offer opportunities to building operators to reduce energy costs and offer an improved value to occupants, today and in the years ahead.

ABB offers a unified enterprise platform that adds intelligence to buildings and provides a holistic solution for building management, resulting in lower costs and improved ROI over a building's life span, optimized performance and functionality, automated monitoring and control, greater occupant comfort, and enhanced safety and security.

CONTEXT

Julie Petrone presented advances in technology offerings in the building space. Ms. Petrone discussed the role of smart buildings now and the future, and the impact of continuously evolving smart building technologies on energy use and sustainability.

KEY TAKEAWAYS

Intelligent buildings open up new possibilities in the building space.

The building space is continuously evolving. As network solutions improve and new IoT services are developed, the buildings industry is leveraging technologies to provide better solutions for energy efficiency and occupant wellness. Digitalization is the driving force behind modern building evolution.

Data-driven intelligence and automation have transformed commercial buildings into efficient, sustainable, safe, and comfortable environments that

intelligently adapt and respond to people's needs. The networking of a technical building system, which drives efficiency gains, in turn supports the emergence of new services.

The functions available in smart buildings have evolved over time.

In the past, a facilities manager had to rely on guesswork to assess how a building was performing each day to support decisions around air management and comfort controls, often resulting in more expensive and less efficient operations. However, contemporary smart buildings include lighting, ventilation, and/or heating systems that respond to the presence of occupants, as well as online security software and sensors that enable app-based building management.

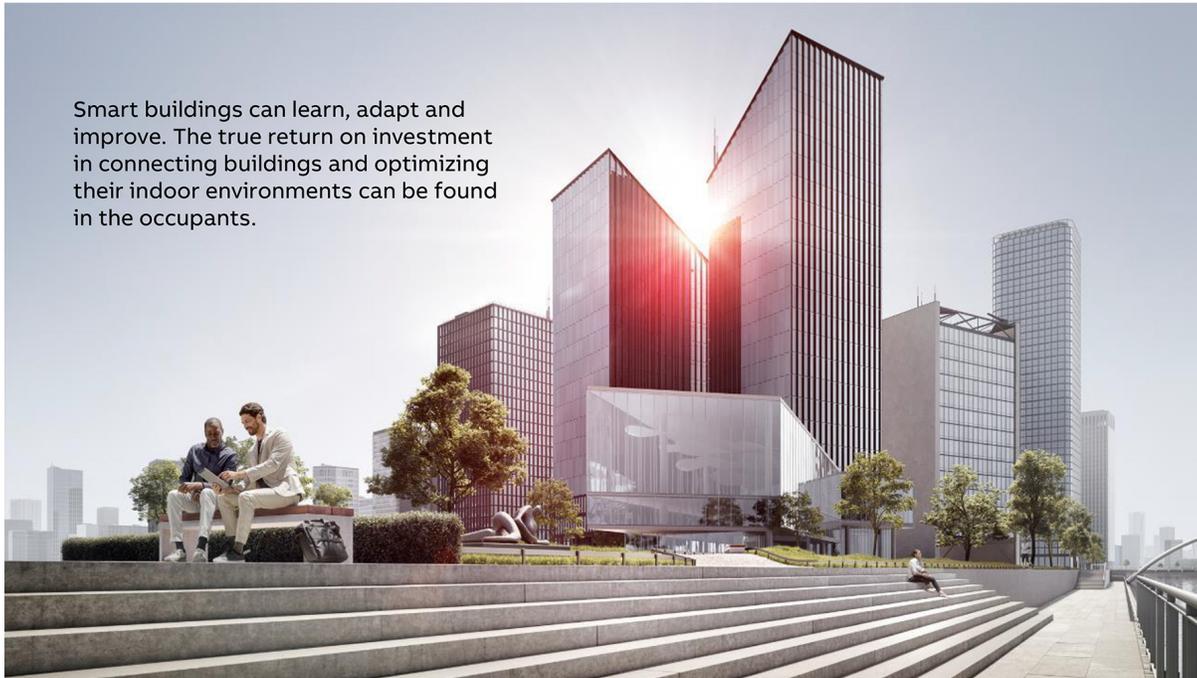
As intelligent buildings evolve, not only will they be able to predict maintenance, but they will have the ability to self-correct. These environments will do more than support our way of living—they will augment and enhance our lives through ambient social infrastructure that connects and interacts with occupants to improve circumstances.

The common thread running through smart buildings use cases is humans. These are spaces in which humans can converge. They can interact with each other and utilize advanced technology to perform necessary functions, and benefit from the digitally enhanced experience.

Julie Petrone, ABB Building Solutions

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Figure 1: Smart buildings add value to occupants' lives



Smart buildings can learn, adapt and improve. The true return on investment in connecting buildings and optimizing their indoor environments can be found in the occupants.

Smart buildings support sustainability goals.

Buildings account for nearly 40% of global CO₂ emissions through construction and operations. However, intelligent networking of technical building systems that boost efficiency—including the incorporation of Power over Ethernet (PoE) into building operations—and the addition of new, intelligent services lead to increased sustainability. Through energy usage analysis and optimization, smart building technology can reduce emissions, and in some cases, achieve zero-carbon certification. A data-centric solution also helps monitor and improve energy usage and reach sustainability goals.

Governmental regulations and societal pressure are driving firms to outline progressive, ambitious sustainability goals. In most new builds and many retrofits, carbon emissions and standards, such as LEED or the WELL Building Standard, are required. Federal and state programs, as well as rebates, offer financial

incentives for companies to reduce their carbon use and/or become carbon neutral or even carbon negative. These incentives, in turn, help companies save money and lower the negative impact on the environment.

These types of building systems can . . . deliver sustainable environments through innovative future-proof technology. And by analyzing—to optimize this energy use throughout—building owners can determine the best course of action to reduce emissions and lower carbon use. That's what [ABB] is striving to do.

Julie Petrone, ABB Building Solutions

Figure 2: The future of sustainability

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| Carbon-neutral buildings employ three key components, which directly align with the need for exponential growth in the connected buildings space | Using less energy (i.e. improving energy efficiency; geothermal, for example) | Buying better energy (such as renewable energy credits, demand saving strategies, and energy storage, which often have attractive utility cost savings) | Self-generating more energy (like solar and wind) |

Smart buildings are the foundation of an energy-efficient future, where buildings can autonomously monitor, regulate, analyze, and optimize their own energy consumption. In conjunction with policy decisions and investments that take into account long-term climate impact, smart buildings have the potential to help achieve significant sustainability goals, such as climate neutrality by the year 2050.

Smart buildings contribute to better health.

The economic and social disruption caused by COVID-19 accelerated and shifted needs and possibilities in the smart building space, especially with regard to new technologies and innovative solutions. As buildings reopen, owners and occupants are both focused on performance, connectivity, and resilience.

Requirements for social distancing, occupancy tracking and monitoring, and improved ventilation and sanitation created a need for improved sensor technologies. Research conducted in response to the pandemic found that air temperature and humidity levels inside a building mitigate risk of airborne transmission of illnesses. Of significant priority, therefore, are innovations that manage and maintain high indoor air quality, including air temperature, humidity, presence of airborne particulates such as gases, agents, carbon monoxide, carbon dioxide, and volatile organic compounds.

Connected buildings help monitor air quality and provide measures to the facility manager to help improve air quality within the building, resulting in improved occupancy comfort and health.

Return on Investment depends on more than just energy savings.

Features, services, and information available to and through a smart building support and enhance occupant engagement with the space. This improvement in occupancy comfort will, in turn, improve owners' return on investment.

Energy is a factor in the overall value proposition of smart building technology, but maintenance and repair must also be considered when calculating value. A combined value from optimizing maintenance activities, identifying equipment faults in real time, and delaying capital expenditures for replacements, as well as the impact on the tenant experience, will help inform the best decision for which technologies to implement.

Depending on the investment, savings achieved through the benefits of the enhancements applied can return positive operating financial benefits in one to a few years. The exact timeframe to see ROI depends on building type, size, and operating behavior applications installed. The biggest ROI in commercial buildings is primarily driven by energy savings achieved through smart lighting and smart HVAC that work in conjunction with sensors, occupancy sensors, and submeters.

Connectivity and converged infrastructure are critical to the future of smart buildings.

A high number of smart devices in a building does not mean the building is smart if those devices are not interoperating. A disconnected building cannot collect the data necessary to creating a better occupancy experience and lowering energy usage. Connectivity is a critical part of the future of smart buildings.

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Figure 3: The future of connectivity



There has been a lot of progress made in the built environment and equipment spaces but know there is still work to be done as an industry.



The industry moves fast, and I look forward to deploying even more inventive, state-of-the-art technologies, with more offerings that leverage building connectivity, data analysis and our in-house expertise.



A “disconnected” building will soon become a relic.

As continued improvements are made in AI solutions that leverage built-in IoT devices, smart buildings will provide correspondingly better service and technology to customers. In addition to connectivity, insightful data enables solutions that improve a building’s performance, including decreasing greenhouse gas emissions, increasing energy savings, and helping building owners make the right decision for both facilities and our planet.

The industry recognizes the need to respond to global megatrends, like climate change and resource constraints. Where these megatrends intersect with technologies and innovation is where smart buildings fit in.

ABB not only places priority on environmental sustainability for their own business; they also continuously develop and improve technology for smart buildings, at rapid speed.

As smarter IoT devices are introduced to the world, businesses benefit from combining disparate building systems into a converged infrastructure—bundled systems that include servers, storage and networking, and management software—integrated with IoT solutions that results in optimized building systems operations and maintenance. Converged systems, such as those offered by ABB, are the core drivers behind smart buildings even today. Unified platforms connect devices and data to deliver a holistic solution for occupants, building managers, and building owners.

ADDITIONAL INFORMATION

ABB is committed to providing the planet with the future of safe, smart, sustainable electrification. For more information, visit [ABB Building Solutions](#).

BIOGRAPHY

Julie Petrone

Director of Marketing & Strategy, ABB Building Solutions, Americas - Electrification, Smart Buildings Division

Julie combines her passion for sustainability and technology with her experience in product and marketing analytics. She is leading initiatives on brand management, partner marketing, product messaging strategy and launches, and public relations.

She is the recipient of numerous awards including the Lions D’Argent contender, Cannes Film Festival for “Meet dotdot.”

She graduated magna cum laude from Cal State University, Bakersfield with a degree in Marketing Communications and with honors from Duke University, The Fuqua School of Business MBA program with an emphasis on strategy.