



Building a
Sustainable Future with
Smart Buildings

Smart Buildings help empower owners and operators to meet their environmental and sustainability goals by reimagining how facilities are designed, operated, and maintained. By integrating advanced technologies such as Building Management Systems (BMS) and Energy Management Systems (EMS), organizations can monitor real-time energy consumption, improve waste management, and optimize water and lighting use—contributing to both efficiency and long-term environmental impact. New constructions and renovations can incorporate materials like low-carbon bricks, environmentally sustainable concrete, and smart glass windows that adjust heating based on the conditions inside.

Advanced tech like IoT and AI, as well as sustainable materials, can help improve energy management, resource and waste management, and emissions.

ENVIRONMENTAL IMPACTS OF SMART BUILDINGS

Smart Buildings drive positive environmental impacts through the following:

ENERGY MANAGEMENT

Sensor-enabled heating, cooling systems, and optimized lighting may reduce energy consumption, improving energy efficiency and carbon neutrality.

RESOURCE & WASTE MANAGEMENT

Systems can be incorporated to improve operational efficiency, manage and reduce waste, and improve water management practices.

EMISSIONS

Optimize energy use through energy management and incorporation of renewable energy sources.

Energy management

Smart Buildings are about smart energy use. Implementing EMS can help organizations manage energy use through continuous monitoring and improving efficiency. Here's how they can make a difference:



ENERGY MONITORING

In 2023, buildings consumed over 120 exajoules (EJ)¹ of energy—accounting for 28% of global energy use—with demand growing at an average rate of 0.9% per year since 2010.² As data center needs surge alongside the expansion of cloud computing and AI, global building energy consumption is projected to more than double by 2026.³ Energy Management Systems (EMS) play an important role in addressing this challenge by enabling real-time monitoring, analysis, and reduced energy use—helping to pave the way for smarter, more sustainable buildings.



ENERGY SAVINGS

An International Energy Agency (IEA) study of over 200 EMS case studies from 2016 to 2023 showed average savings of 13.5% across industries. Less energy-intensive sectors saved 10-18%, while heavy industries saved 5-11%.⁴ Savings improved each year with ongoing EMS monitoring.

More than half of 1,280 businesses surveyed have already adopted Smart Building management systems to boost operational efficiency.⁵

A 2021 Deloitte analysis of 20 Smart Buildings revealed that these facilities consumed 34% less electricity compared to traditional buildings—primarily by optimizing heating and cooling systems.

In contrast, data from 440 conventional buildings showed that two-thirds of their electricity use was tied to heating and cooling, highlighting the significant energy-saving potential of smart technologies.⁶

Resource and waste management

With a growing population, finite resources like water are being impacted. A United Nations study found that by 2050, three out of four people could face impacts from droughts, with current costs already exceeding \$307 billion annually.⁷

Smart Buildings can help conserve resources and reduce waste, saving costs and boosting sustainability. Here's how:



RESOURCE MANAGEMENT

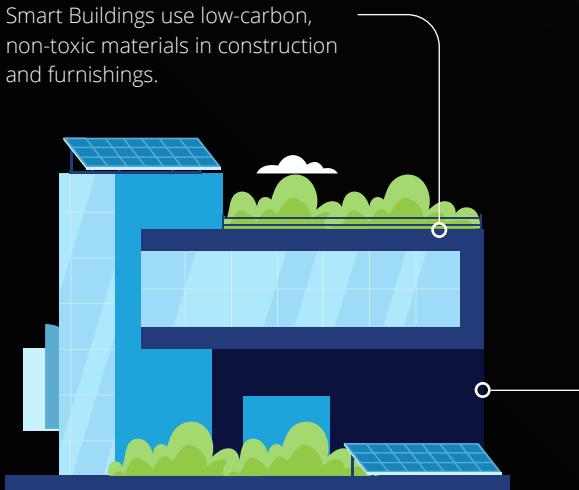
Smart Buildings can help manage and optimize resource usage by using IoT sensors. These sensors can track water consumption in real time and detect leaks to prevent waste and damage. Smart irrigation systems also help, using weather and soil data to water plants only when needed.



WASTE MANAGEMENT

Technologies like smart bins and recycling systems help manage waste efficiently. Smart bins signal when they are full, making trash collection more efficient. Automated recycling systems sort materials using sensors, helping improve recycling processes.

Smart Buildings use low-carbon, non-toxic materials in construction and furnishings.



Emission reduction

In 2022, buildings accounted for 37% of global carbon emissions, including daily usage emissions and the carbon from producing, transporting, and disposing materials. Smart Buildings help reduce these emissions by using sustainable design and materials.⁸

Operational emissions can be impacted with technologies like Building Management Systems (BMS), sensor-enabled heating and cooling, and optimized lighting.

Investing in the future

As organizations face pressure to improve sustainability, adopting Smart Building technology can help meet expectations and reduce operational costs. Digital twins can help organizations become more proactive—working to prevent issues instead of just reacting when they arise. Organizations can plan for major weather events, which in turn can help keep employees safe and systems running smoothly.

With technology evolving at a rapid pace, falling behind can have consequences—and can impact profitability, property values, and the ability to attract top talent. As environmental regulations tighten and market expectations shift, CEOs should stay ahead of the curve. Proactively adapting to these changes can help with compliance and also position organizations to lead in a more sustainable, competitive future.



Reach out to Deloitte to learn how we can help support your Smart Building goals.



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Appendix

¹ Exajoule

² IEA 2024 Energy Efficiency

³ "2025 commercial real estate outlook" Deloitte Insights, 2024.

⁴ IEA 2024 Energy Efficiency

⁵ IEA 2024 Energy Efficiency; markets include Europe includes Germany, Italy, Spain, Sweden and the United Kingdom; North America includes the United States; Latin America includes Argentina, Brazil and Mexico; and Asia includes China, India, Indonesia and Malaysia.

⁶ [Smart-Building-Study-Focus-on-the-facts.pdf](#)

⁷ [UNU-INWEH, 2024](#)

⁸ [Global Status Report for Buildings and Construction | UNEP - UN Environment Programme](#)

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