

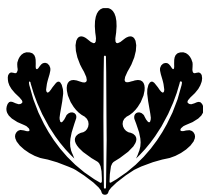


Green Building Trends and Sentiments

U.S. Green Building Council

June 2023





Green building practices are more important than ever. Green buildings save money, improve efficiency, lower carbon emissions and create healthier places for people. They are critical to addressing climate change and meeting ESG goals, enhancing resilience and supporting more equitable communities.

In the spring of 2023, members of the green building community were invited to participate in an industry poll that aimed to capture their views on current issues and priorities. The survey received 512 responses from various green building professionals, including USGBC members and LEED project teams¹. **The survey results showed that sustainability is a top priority for most respondents, as it aligns with their mission and helps them stand out in the market.** Human health, decarbonization, energy efficiency and net zero were among the top priorities, all considered moderately important. According to the survey participants, energy efficiency is a crucial factor in measuring success. Green buildings that effectively reduce energy consumption are considered to be successful.

Lack of funding and lack of knowledge were identified as key barriers to implementing green building practices and projects. Building owners, tenants and policymakers strive to decrease their carbon footprint, improve occupant health and well-being and enhance the resilience of buildings to extreme weather events.

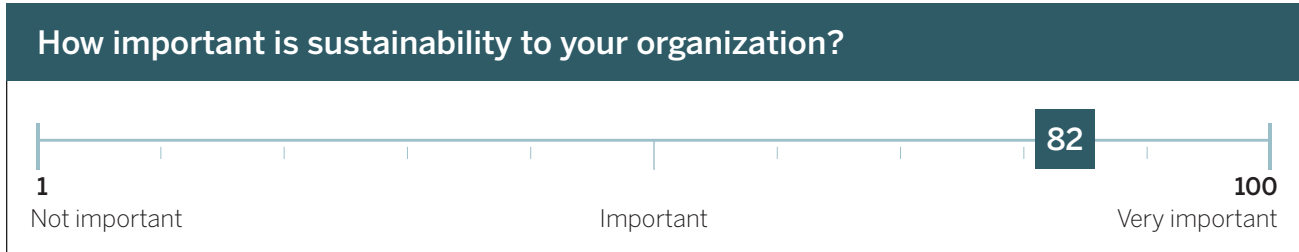
NOTABLE STRATEGIES IDENTIFIED BY RESPONDENTS TO SUPPORT USGBC'S PRIORITIES

- According to responses, passive design principles and energy-efficient equipment were cited as the most effective strategies for building decarbonization. Regarding government programs and policies that can support decarbonization, energy codes, performance standards and building grades were the most highly ranked by respondents.
- Selecting healthy materials, using durable and low-maintenance materials and integrating circular economy principles were identified as critical considerations during the building process. Materials were also highlighted as a key topic connected to retrofitting.
- According to the research, the strategies that ranked the highest for biodiversity were reducing light pollution and incorporating green roofs and walls.
- Green building certifications were identified as a leading strategy for supporting equity in the built environment.

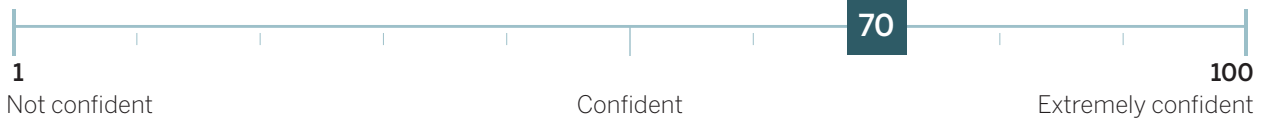
As we look to the rest of 2023 and beyond, here are the trends shaping the future of the green building industry, which includes a summary of the responses to the industry poll.

Sustainability

Most of the organizations that responded, placed a high value on sustainability. The main reasons for this were that it is integral to their organizational mission and a part of their business strategy, serving to stand out in the market or gain a competitive edge.

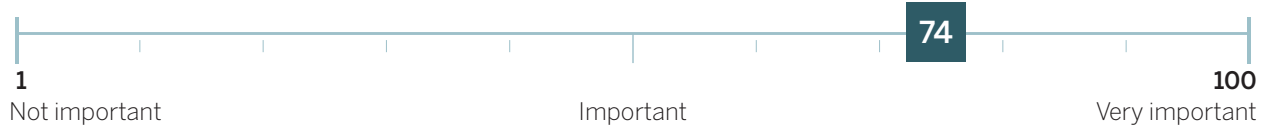


How confident are you in the ability of green building practices to positively impact climate change?



Certified green buildings

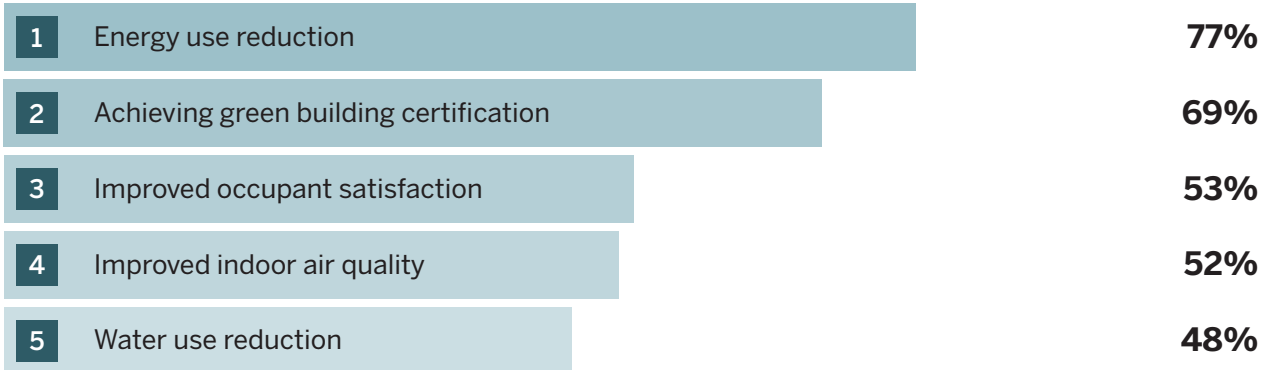
Rate the importance of certified green building as part of your organization's current sustainability efforts



Rank the following issues as drivers for customers' or clients' green building programs



How does your organization measure the success of your green building projects?



Do you think the U.S. buildings stock will reduce emissions by 2030?



Do you think the U.S. buildings stock could reduce emissions by 2030?



Rate your agreement with the following statements

Every building our organization occupies should be LEED-certified **3.85 out of 5**

Every building we work on should be LEED-certified **3.57 out of 5**

What percentage of your projects are pursuing green building or energy certifications?



How do you measure and report on the sustainability of your buildings?

1	Through green building certification such as LEED	65%
2	Manually/spreadsheet tracking at each building	31%
3	Manually/spreadsheet tracking centrally	23%
4	Using Arc for LEED recertifications	15%
5	Other portfolio software	15%
6	With building performance platforms such as Arc	13%



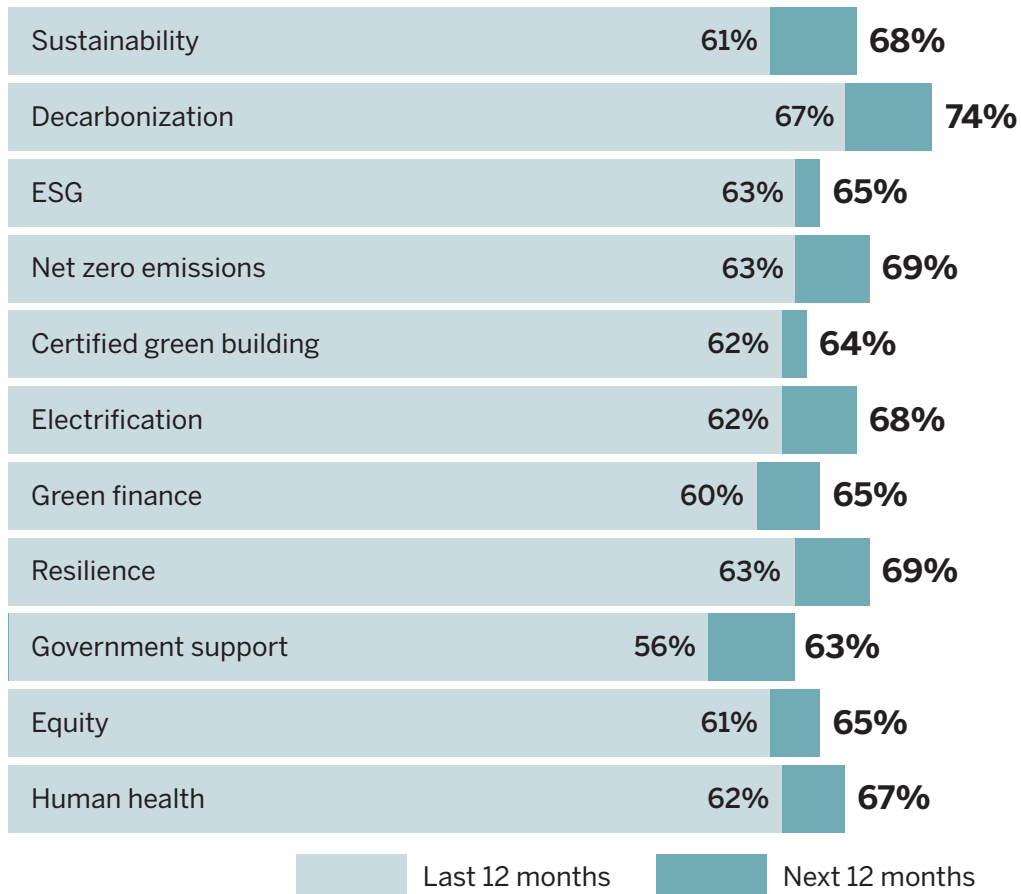
Priorities

Rank the issues based on current importance to your organization

- 1 Energy efficiency
- 2 Human health
- 3 Decarbonization
- 4 Net zero targets or goals
- 5 Clean energy and building policies
- 6 Resilience
- 7 Climate risks
- 8 ESG
- 9 Electrification
- 10 Diversity, equity and inclusion
- 11 Sustainable investing
- 12 Green finance/bonds



Importance of priorities over time



Clif Bar Headquarters | Photo: © Clif Bar & Company

Net zero

According to the survey respondents, the concept of net zero remains significant. Net zero buildings, whether they aim for net zero energy or net zero carbon, represent a concrete achievement where the building's consumption and production are balanced through strategies such as energy-efficient building design and operations, renewable energy sources and energy storage systems. These strategies are also reflected in other priorities such as efficiency and decarbonization.

The [LEED rating system's Energy and Atmosphere \(EA\)](#) credits focus on energy performance and carbon reduction. For new buildings, required strategies include designing reduced for energy needs, refrigerant management, energy metering and commissioning, energy modeling and minimum energy performance as well as commissioning and the integration of best practices. Optional credits offer guidelines for achievement in advanced energy efficiency measures, renewable energy use, grid harmonization and carbon offset projects. Existing building strategies are similar, with the addition of energy efficiency best management practices.

LEED supports net zero energy buildings by taking an efficiency first approach to energy use that is then supported by rewarding the incorporation of renewable energy systems that utilize solar, wind and geothermal systems.

LEED buildings often use energy-efficient materials, systems and technologies like high-efficiency HVAC systems, LED lighting and building automation systems to reduce energy consumption and carbon emissions.

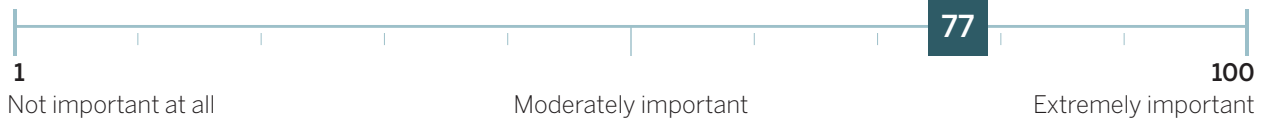
As a complement to LEED certification, [LEED Zero](#) verifies the achievement of net zero goals in existing buildings:

- **LEED Zero Carbon** acknowledges achieving net zero carbon emissions by reducing (efficiency), avoiding (renewable energy) and only if necessary offsetting (certified credits) the carbon emissions over 12 months resulting from energy consumption.
- **LEED Zero Energy** is achieved when there is an equal balance between the energy used and the energy produced from renewable sources over 12 months.
- **LEED Zero Water** is achieved when there is no net use of potable water over 12 months.
- **LEED Zero Waste** recognizes buildings that achieve GBCI's [TRUE certification](#) at the Platinum level.

How important do you think achieving net zero emissions is to the green building industry?



How important do you think decarbonization is to the green building industry?



Rank the strategies that are important to building decarbonization

- 1 Passive design principles
- 2 Energy efficient equipment
- 3 Reducing embodied carbon of key materials: concrete, steel, glass
- 4 Well insulated and sealed envelope
- 5 Availability of renewable energy (on site, off site or grid purchase, PPA, etc.)
- 6 Electric heating, cooling, and hot water systems
- 7 Reducing embodied carbon of other materials and products
- 8 Low global warming potential Refrigerants
- 9 Commissioning
- 10 Building-grid integration, demand response, peak demand reduction



Health and well-being

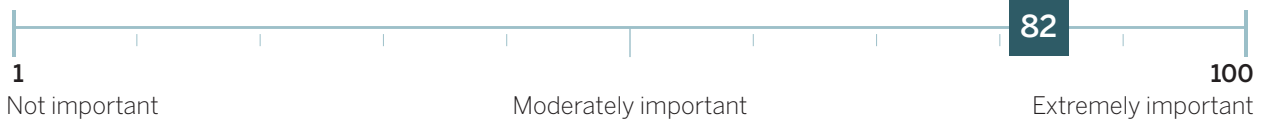
The COVID-19 pandemic brought greater awareness that indoor air quality, natural light and other factors significantly impact human health and well-being in indoor spaces. As a result, green building practices have gained more attention for their importance in protecting health and promoting wellness, which the survey shows will continue to be significant issues. Studies confirm that various building practices have a significant impact on promoting favorable health and wellness results.

While LEED contains several health-related strategies, practitioners must be intentional in their use of LEED to maximize its potential health benefit. A needs-based health promotion process such as the [LEED Integrative Process for Health Promotion](#) (IPHP) pilot credit can help project teams select and tailor LEED credits based on a project's specific health context. [Access human health-related tools and resources.](#)

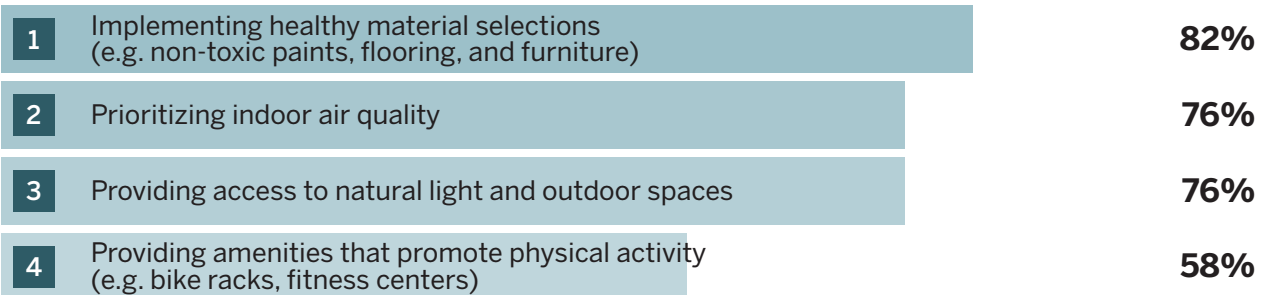
Many credits within the [LEED v4](#) and [LEED v4.1](#) rating systems address the health of the site user, and health-related credits are found within every LEED credit category. These credits include guidance on improving indoor air quality, promoting physical activity and healthy nutrition and designing for mental health and comfort, among many others.

With an intentional, needs-based approach to applying credit requirements, projects can target health goals most relevant to their project's population. Practitioners can also leverage the power of the rating system to achieve sustainability and energy efficiency goals while focusing on health promotion efforts.

How important do you think human health and well-being is to the green building industry?



What strategies do you use to promote human health in your green building projects?



Resilient design

There has been a growing interest in resilient design as a result of the rising frequency of extreme weather events such as hurricanes, floods and wildfires. According to survey responses, building owners and tenants are more interested in green building practices that align with resilience needs. High-performance building envelopes, stormwater management systems and sustainable backup power systems are some examples of resilient design practices.



Through LEED and other programs and initiatives, USGBC promotes and advocates for the design, construction, operation and maintenance that address and emphasize resilience in buildings, landscapes, power systems and communities.

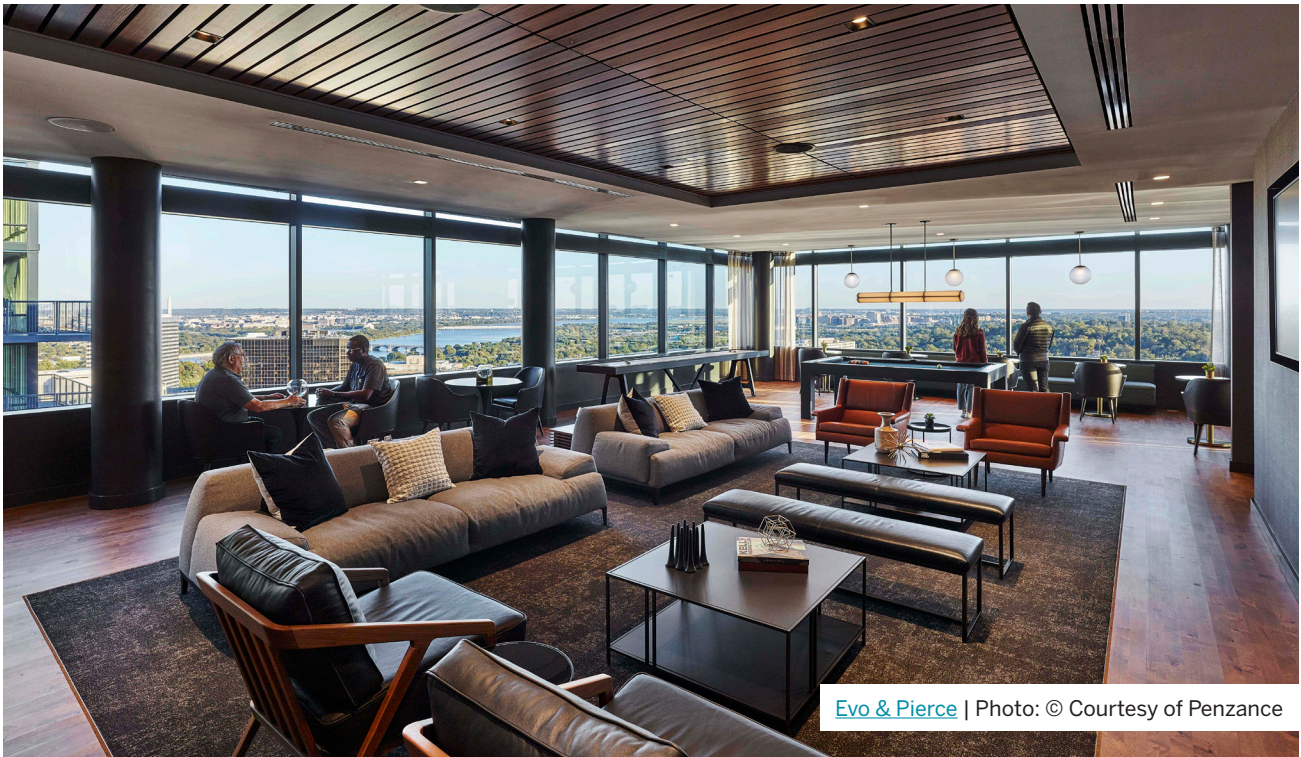
LEED promotes resilience in several ways:

- LEED Resilient Design pilot credits are available to all new construction projects seeking to certify through [LEED v4](#) or [LEED v4.1](#).
 - [Assessment and Planning for Resilience](#) (IPpc98): This credit encourages project teams to determine potential vulnerabilities at the project location. With recent revisions to the credit, risks that must be considered as part of this credit now include sea level rise, extreme heat and more intense winter storms. To earn the credit, project teams must identify risks related to the effects of climate change (this consideration was previously considered optional).
 - [Designing for Enhanced Resilience](#) (IPpc99): This credit ensures that the risk-related information collected as mandated by credit IPpc98 is considered via mitigation measures. Initially, this credit required addressing the top three hazards for one point. The revised credit states that project teams must address one or two top threats, with one point available for each. This tiered approach allows teams to earn acknowledgment for mitigating multiple types of risks.
 - [Passive Survivability and Back-Up Power During Disruptions](#) (IPpc100): This credit centers around the concept that buildings should be able to safely shelter occupants during a power outage and provide backup power. Initially, this credit also addressed access to potable water, but that path has been rewritten as an option for one of the compliance paths.
- The [LEED for Cities and Communities](#) rating system supports progress towards better, more resilient community planning spaces. This rating system provides solutions for measuring and managing energy and water use, human experience, waste production and transportation usage on a city scale.

For examples of LEED-certified projects that have exhibited exemplary resilience, see our [Profiles in Resilience](#) brief.

Which of the following strategies, that also support resilience, are you currently implementing in your buildings?

1	Using high-performance materials and insulation	68%
2	Prioritizing durability in materials	58%
3	Implementing water management strategies, such as rainwater harvesting or graywater systems	50%
4	Installing backup power systems	47%
5	Site-specific physical risk assessment	44%
6	Elevating critical elements above future flood levels	42%
7	Designing buildings with adaptive reuse in mind	35%
8	Installing onsite solar plus battery storage	35%
9	Using passive survivability	34%
10	Applying specialized criteria such as for hurricanes or earthquakes	19%
11	None of the above	3%



Passive design

Buildings consume energy throughout their life cycle, starting from construction and continuing through operations and demolition. Substantial evidence shows that buildings designed considering the climate and local context consume less energy than conventional buildings. Climate-responsive or passive design is a core strategy to reduce energy demand sustainability and support related priorities for efficiency and decarbonization.

Passive design is encouraged in LEED across various credits, as well as supported through many courses in USGBC's course catalog. Among these passive design strategies are:

- **Orientation and building form:** Proper building orientation and shape can work toward the building's goals to avoid or capture solar heat gain, maximize daylighting and enhance the site.
- **Shading and sun control:** Strategic placement of shading devices such as overhangs, louvers, or exterior blinds can prevent excessive solar heat gain during hot seasons while allowing sunlight in during colder months. Plantings can also reduce solar heat gain while improving air quality and drawing down emissions.
- **Roof design:** Cool roofs with high solar reflectance and thermal emissivity help reduce heat absorption, lowering cooling loads. Green roofs also provide insulation and mitigate the urban heat island effect.
- **Insulation and moisture control:** Designing the building envelope for effective insulation and moisture control reduces thermal transfer and creates healthy indoor air while stabilizing indoor temperatures.
- **High-performance windows:** Energy-efficient windows with appropriate solar heat gain coefficients and glazing can reduce heat gain or loss, improve daylighting and minimize the need for artificial lighting.
- **Efficient lighting design:** Incorporating energy-efficient fixtures, lamps and daylight-responsive lighting controls helps to reduce energy consumption.
- **Passive solar heating:** Using building materials, systems and design elements to capture and store solar energy for space heating such as incorporating large windows on the southern side, can reduce reliance on heating systems.
- **Water efficiency:** Implementing water-saving fixtures, rainwater harvesting systems and greywater recycling helps reduce water consumption and supports sustainable water management. Saving water also saves energy, reducing the electrical demands that come with pumps, water treatment, heating and cooling and delivery.
- **Natural landscaping:** Employing climate-adapted vegetation and using rainwater for irrigation helps conserve water resources and reduce the need for irrigation systems.

What new technologies or design strategies are you currently exploring?

1	High-efficiency heating, cooling, and ventilation systems: highly efficient systems like geothermal or air-source heat pumps, heat recovery ventilators, and other innovative technologies.	71%
2	Achieving green building certification	66%
3	Improved occupant satisfaction	60%
4	Improved indoor air quality	44%
5	Water use reduction	45%

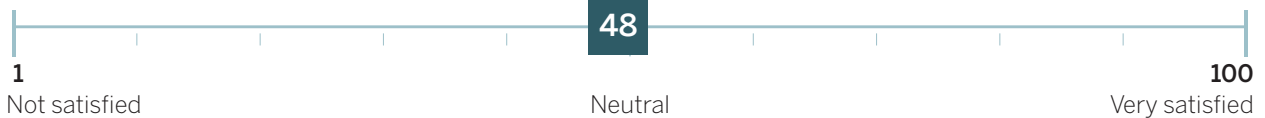


Government influence

Governments can drive and engage in green building activity through leadership in their own portfolios; policies that enable green building; setting the floor for energy and water efficiency through codes; and providing incentives for green building, whole building efficiency and specific clean energy technologies. With recent laws in the U.S. and initiatives in Europe, these government activities will be critical in driving green building practices in 2023. With the passage of the Infrastructure Investment and Jobs Act and the Inflation Reduction Act, billions of dollars of funding are becoming available in the U.S., the government will significantly promote sustainable building practices. Additionally, with specific movements like ESG and the EU taxonomy in Europe, we will see this momentum carry forward globally.

New tax incentives, low-cost financing and grant programs under the [Inflation Reduction Act](#) make a compelling case for incorporating green practices into building projects.

How satisfied are you with the current level of government support for green building initiatives?



Among the many improvements under the new law is that many of the [tax incentives](#) encouraging green building are not only more generous but also much more accessible to public and nonprofit entities through mechanisms that allow the incentives to be easily transferred or, in some cases, provided essentially as rebates through direct pay provisions.

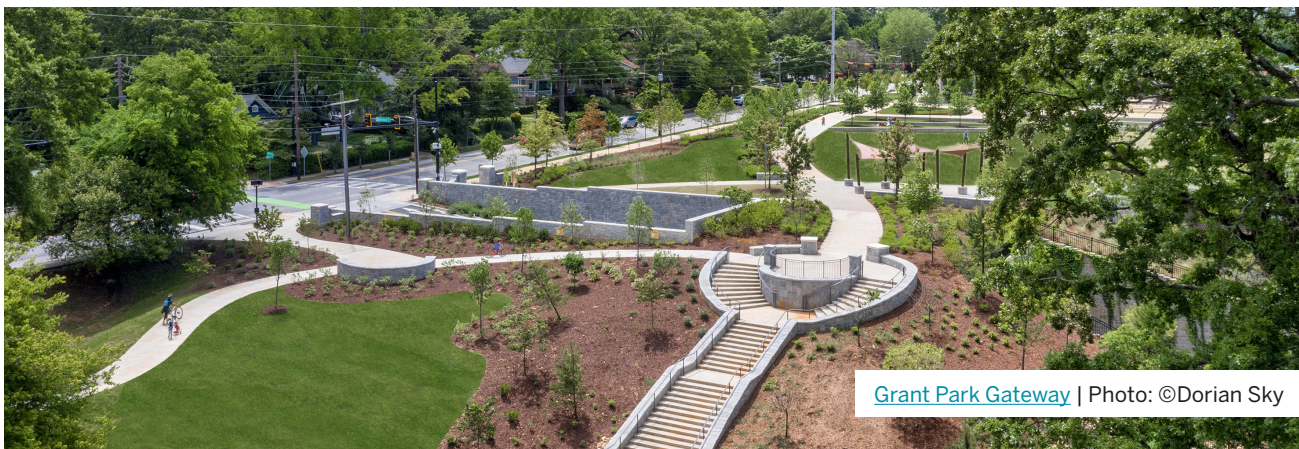
Additionally, the [U.S. Department of Energy](#), the [EPA](#) and other agencies are busy implementing various programs that state and local governments can use for building projects, providing low-cost capital and, in some cases, outright grants to fund all or a portion of a project.



Survey respondents expressed their approval for stricter regulations that include codes and performance standards. They also favored market transparency through benchmarking. In terms of incentives, respondents ranked financial benefits for whole building and net zero activities as their top choice, followed by incentives for individual equipment and technologies. These results demonstrate a strong desire to promote high efficiency, low carbon buildings across the industry and to elevate standards overall.

Rank the government policies and programs that are important to building decarbonization.

- 1 Stronger building energy codes
- 2 Mandatory building performance standards
- 3 Mandatory energy benchmarking and disclosure, such as building grades
- 4 Financial incentives for deep energy retrofits/whole building efficiency
- 5 Financial incentives for net zero emissions
- 6 Financial incentives for on-site renewable energy and storage
- 7 Rebates and incentives for electric equipment
- 8 Rebates and incentives for efficient equipment
- 9 Local technical assistance and education hubs
- 10 Utility assistance and incentive programs
- 11 Workforce training initiatives
- 12 Voluntary leadership programs



[Grant Park Gateway](#) | Photo: ©Dorian Sky

Green and living materials

Green and living materials involve using sustainable and biophilic materials in building design and construction. This core tenet of green building supports priority outcomes including health and well-being, reduced carbon footprint, aesthetics and innovation.

LEED encourages using sustainable and biophilic materials in building design and construction through its [Materials and Resources credit category](#). The use of green and living materials can have several benefits, such as improving indoor air quality, reducing the carbon footprint of a building and enhancing the aesthetic appeal of buildings by adding natural elements and textures.

Under the Materials and Resources category, LEED awards points for using building materials and products with environmentally preferable life cycle impacts. This includes recycled, rapidly renewable and locally sourced materials, as well as those that have been responsibly harvested and certified by third-party organizations.

LEED also encourages biophilic design elements that promote a connection with nature, such as the use of natural light and views of the outdoors. This can be achieved with green roofs and walls, which provide aesthetic benefits but also help to reduce heat gain and improve air quality.

Green building is poised to grow significantly, and several market sectors will play a significant role in driving this growth. Industrial and warehouse buildings, health care facilities, schools and universities and hospitality, residential and government buildings are all market sectors targeted for green building practices.

Each sector has unique opportunities and challenges for implementing sustainable building practices. Green building practices can help reduce operating costs, enhance occupant health and well-being and promote sustainability, making them an attractive option for building owners and tenants.

As we move toward a more sustainable future, green building will help us reduce our carbon footprint, protect the environment and create healthier, more resilient and more thriving communities for generations to come.

How does your organization approach the challenge of retrofitting existing buildings to be more sustainable?

1	Implementing healthy material selections (e.g. non-toxic paints, flooring, and furniture)	82%
2	Prioritizing indoor air quality	76%
3	Providing access to natural light and outdoor spaces	76%
4	Providing amenities that promote physical activity (e.g. bike racks, fitness centers)	58%

How do you incorporate the principles of circular economy in your green building projects?

1	Prioritizing durable, low-maintenance materials	71%
2	Designing buildings for disassembly and material reuse	27%
3	Implementing closed-loop water systems	23%

What design strategies, that also support biodiversity, do you implement in your buildings?

1	Reducing light pollution	68%
2	Incorporating green roofs and walls	56%
3	Creating wildlife friendly habitats	47%
4	Minimizing pesticide use	34%
5	None of the above	5%

- 1 Audiences invited included USGBC members and LEED project teams. The survey received 512 responses. The industries represented by respondents included architecture (commercial and residential), civil engineering, construction (commercial and residential), corporate/retail, education, energy management/efficiency, finance/insurance, government (central/federal and state/local), green building/LEED consulting, legal, manufacturing, MEP engineering, non-profit, operations & maintenance, planning (site, master, urban/regional), product manufacturer, professional service consulting, real estate (commercial and residential) and utility/energy services. Job titles of respondents included administrator, architect, attorney/lawyer, builder/contractor, business development/sales, consultant, developer, educator, engineer, facility manager, government (civil employee), hospitality, interior designer, marketing and communications professional, product materials specialist, project manager, property owner and researcher.

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