

TEOP for Architects

How Architects Can Drive High-Performance Office Fit-out Projects



Introduction

Architects have an important role to play in ensuring that the tenant fit-outs they design are as sustainable and energy efficient as possible. Indeed, professionals in the built environment are in a prime position to combat climate change, and the market has begun to acknowledge that reality.

Industry research indicates that client demand continues to drive growth in high-performance, energy-efficient buildings and spaces.¹ State and local policies are also requiring more efficient buildings as jurisdictions begin to shift toward requiring more-stringent standards. For example, New York City recently passed legislation aimed at reducing building carbon emissions by 40% by 2030 and Washington, D.C., has passed legislation requiring that the energy performance of buildings be improved 20% by 2026. And starting in 2020, California is requiring all new residential buildings to be net-zero-energy ready, with commercial buildings following by 2030.

Because half of all commercial buildings nationwide are leased, they present significant opportunities to embed sustainability in the existing built environment. The efficiency of a leased space begins with design, so architects hold the power to create higher-performing spaces and help transform the building sector.

“Architects are always seeking win-win scenarios for our partners. Optimizing energy use in tenant spaces addresses climate issues and creates spaces for people to thrive.”

—Rand Ekman, principal and chief sustainability officer, HKS

The Urban Land Institute (ULI) Tenant Energy Optimization Program (TEOP) is a 10-step process used to achieve energy savings of 30–50% when building tenants are performing a fit-out on a new leased space or conducting

significant improvements. ULI and the American Institute of Architects (AIA) have partnered to publish this resource, which gives architects a road map to the TEOP process that better situates them to help their clients create energy-efficient leased spaces.

AIA emphasizes sustainability and energy efficiency in practice through initiatives such as the [Framework for Design Excellence](#) and the [2030 Commitment](#), which support the goal that all new buildings, developments, and major renovations be carbon-neutral by 2030. These initiatives are having a clear impact: in 2019 alone, the architecture firms that have signed on to the 2030 Commitment reported building energy savings equivalent to taking 4.4 million passenger cars off the road for a year, creating \$4.1 billion in potential operating cost savings.

TEOP is a proven, replicable approach that integrates energy efficiency in tenant space design and construction while delivering excellent financial returns. It has been employed by numerous tenants, including companies such as Bloomberg, LinkedIn, Estée Lauder, Cushman & Wakefield, and Shutterstock to help them meet energy-reduction goals, achieve payback in three to five years, and reach average annual internal rates of return of 25%.

Visit the ULI Tenant Energy Optimization Program website, [TenantEnergy.ULI.org](https://www.tenantenergy.uli.org), for technical resource guides, how-to documents, case studies, and other training materials.

¹ World Green Building Council, *World Green Building Trends 2018 SmartMarket Report*, November 13, 2018.

² Kelly Vaughn. “Three Top Trends Driving Green Lease Leaders,” Rocky Mountain Institute, July 18, 2017.

The 10-step TEOP process

This resource, dedicated to helping link ULI and AIA expertise and programs and spurring collaboration between both memberships, covers how architects can plug into each step of the TEOP process to ensure they are

- harnessing the energy-conservation potential of existing buildings;
- saving clients money; and
- advancing and remaining at the forefront of sustainable design.

PHASE 1: PRE-LEASE



Step 1: Select a team



Step 2: Select an office space

PHASE 2: DESIGN & CONSTRUCTION



Step 3: Set energy performance goals



Step 4: Model utility reduction options



Step 5: Calculate projected financial returns



Step 6: Make final decisions



Step 7: Develop a post-occupancy plan



Step 8: Retrofit the unit(s)

PHASE 3: POST-OCCUPANCY



Step 9: Execute the post-occupancy plan



Step 10: Communicate results



Step 1: Select a team

When making proposals to new clients, how can architects market and advertise expertise and experience in energy and sustainability?

Join the 2030 Commitment.

The 2030 Commitment is an indicator of accountability and transparency in the field. Through the AIA's [Design Data Exchange \(DDx\)](#), signatory firms track and report energy performance data for all projects, not just the standouts. This allows firms to inform designs with data from projects similar in climate, size, type, and other factors, and measure their achievement in energy and cost savings over time. In addition, because clients are starting to give preference to 2030 signatories in requests for proposals (RFPs), joining the 2030 Commitment may give firms an edge in securing new projects.

Build on high-performance credentials.

Architects can market the professional accreditation of team members under the LEED (Leadership in Energy and Environmental Design) or

Living Future programs. These accreditations are distinct from these organizations' certifications for buildings. Clients look for these accreditations as marks of expertise.

Showcase past high-performance projects.

Evidence of impressive achievement speaks for itself. Put high-performance projects on the firm's website, include them in proposals to prospective clients' RFPs, publish articles showcasing the spaces, and present them at conferences or on webinars. Consider including project data on predicted and actual energy use intensity (EUI)³ to stand out from the crowd.

ROADBLOCK

Cost. "The client won't select my bid if it costs more than the competitor's, and sustainable features add to the cost. My firm isn't going to risk losing a project over sustainable features."

Schedule. "The fit-out process is so fast that we don't have time to add intensive analyses or complicated discussions with the client. Anything that delays the schedule doesn't get included—like these TEOP activities."

Demand. "If the client doesn't ask for it in the RFP, we aren't going to rock the boat."

POTENTIAL SOLUTIONS

- High-performance features do not have to add cost. If energy goals are set early in design and well integrated into the design process, they can be cost-neutral or even reduce first cost.
- Include options in the bid for base-level work as well as low-, medium-, and high-level sustainability features for the client to consider as enhancements to the bare minimum. Put the options in front of the client.
- Take on the responsibility for managing the utility incentive process to ensure that the project gets rebates for energy-efficient features and build that into the cost model of the bid.
- Plan for the time required in the original bid scope/timeline. That way it will not extend the timeline; it will always have been part of the plan.
- Standardize best practices that are no cost or low cost so they are included in every project by default.
- Push clients just past their comfort zone and be prepared with talking points on how high-performance design elements add value to the project—such as a cost-benefit analysis, competitive advantage, or employee satisfaction and retention. (See [Step 3](#) for more details.)

³ Energy use intensity (EUI) is a measure of how much energy a building uses per square foot per year.

Step 2: Select a space

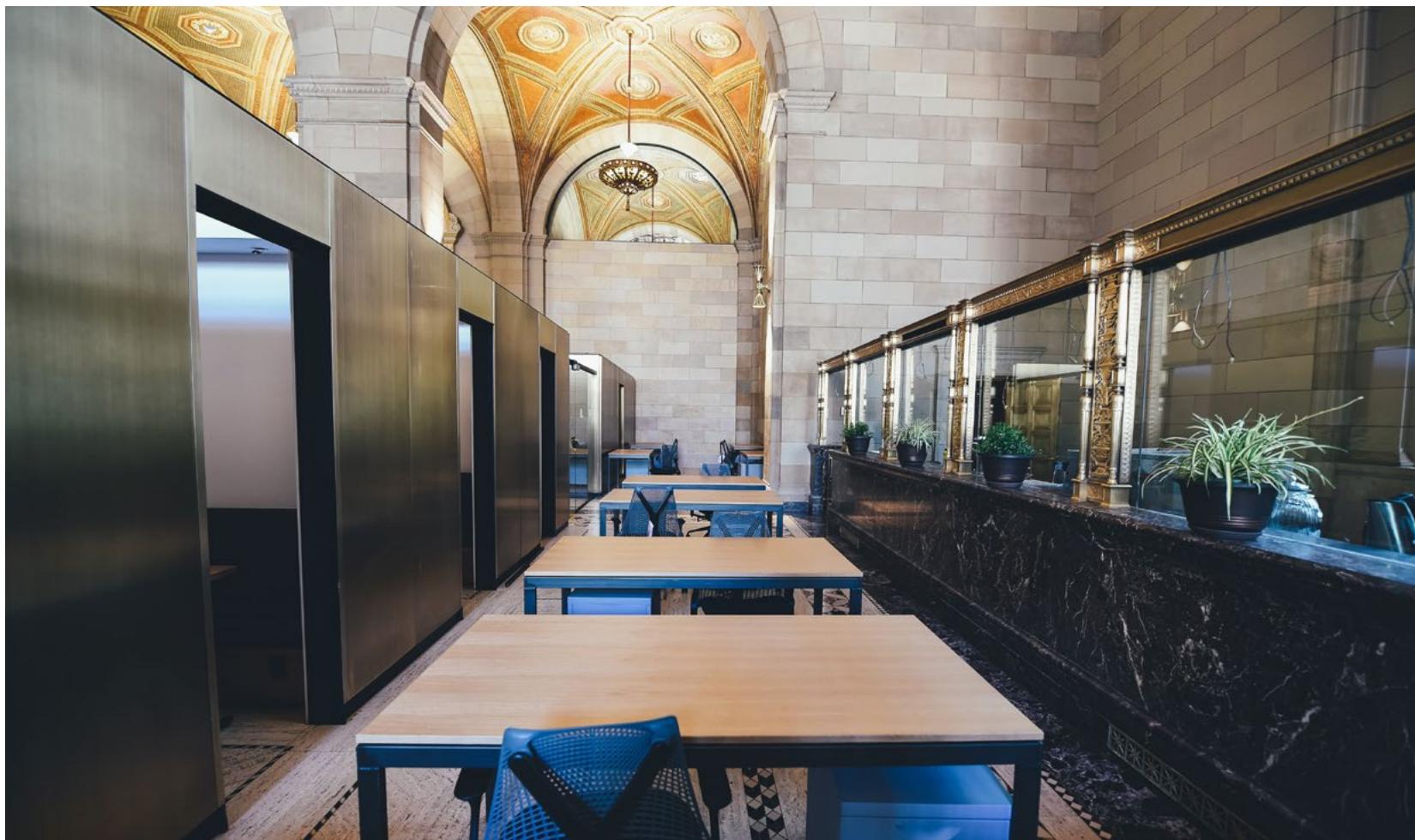
How can architects work with both efficient and inefficient base buildings?

Be prepared for any space.

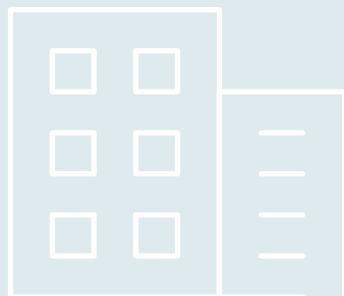
If architects are involved early in the process, they can help guide clients toward spaces that are not larger than needed, which can create savings down the line through more efficient HVAC and lighting use. In addition, it is advantageous to secure spaces with central building management systems because they can respond to sudden fluctuations in occupancy or temperature, avoiding unnecessary energy use. Buildings with separately metered tenant spaces also incentivize energy efficiency strategies for occupants to reduce energy costs.

Because architects may not have influence over which space their clients pick, it is important to understand how energy performance measures can be incorporated into any space.

Several building-system scenarios might make a space or base building challenging. (See table on following page.)



Nontraditional buildings can be retrofitted in creative and sustainable ways.



Solutions to space/base building challenges

CHALLENGES	POTENTIAL SOLUTIONS
<p>Building HVAC systems. Different systems (e.g., radiator vs. forced air vs. chilled beams) have varying levels of efficiency and requirements.</p>	<p>Understand the strengths and weaknesses of every system appropriate for the climate and building/space.</p> <ul style="list-style-type: none"> • Often with a tenant improvement (TI) during a lease renewal in an existing space, the ventilation system cannot be changed. • Many other opportunities exist for improved performance, including creating an efficient layout of the distribution system, defining zones, submetering, and commissioning. • Think through the options with an eye toward optimizing cost, accessibility, acoustics, thermal comfort, and health and wellness.
<p>Inefficient building envelopes. Insulating the space can be difficult when features such as ceiling height, fenestration, roof, and insulation cannot be modified.</p>	<ul style="list-style-type: none"> • A west-facing facade with clear glass can employ blinds or shades to manage glare and solar heat gain. • A north- or south-facing facade may employ continuous daylight-dimming controls for the ambient lighting to maximize energy savings and reduce heat gain during occupied hours. • Other solutions could include <ul style="list-style-type: none"> » daylight harvesting, or » optimized configuration of spaces/offices/conference rooms. • In a single-tenant building, consider <ul style="list-style-type: none"> » triple- or quadruple-paned windows, or electrochromic glass, or » window films.
<p>Energy and temperature controls for tenant space. It may be difficult for tenants to set up systems that interact with base building systems.</p>	<ul style="list-style-type: none"> • Sensors and the internet of things provide increased flexibility to both monitor and control spaces continuously. • Even if control is not possible, rapid feedback through continuous monitoring can reduce downtime and speed up necessary maintenance projects.
<p>Submetering. It may not be possible to install submeters because of existing building circuits/wiring.</p>	<ul style="list-style-type: none"> • If submetering is viable, include plans for it at the beginning of the project. • Note that submeter options today exist at many different price points and levels of sophistication.



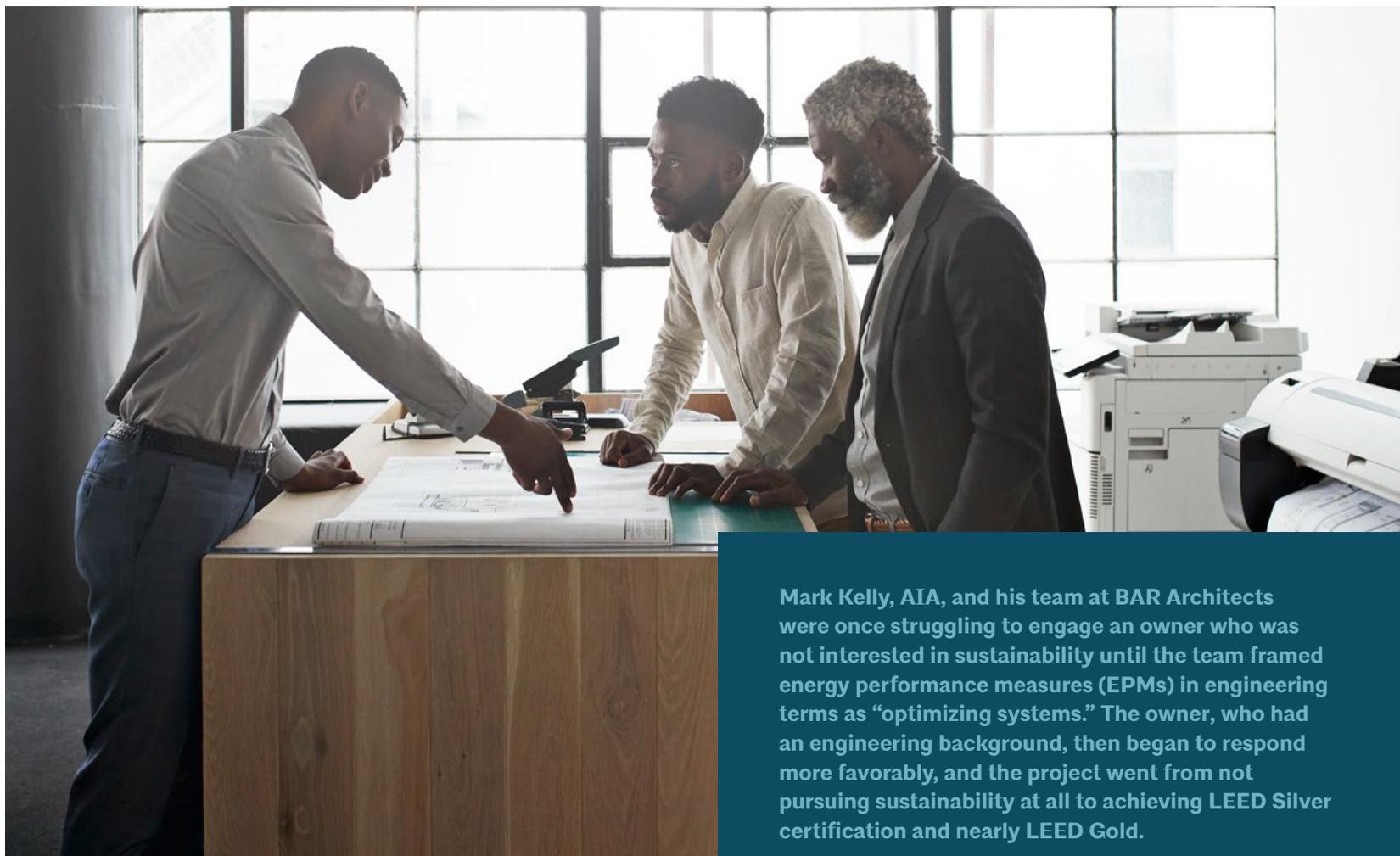
Step 3: Set energy performance goals

What does setting a goal involve? How can architects help?

Collaborate with clients on energy performance goals.

Goals typically originate with clients or building owners, or both, but architects can help determine the feasibility of those goals, introduce new goals (such as meeting the 2030 Commitment targets), or help clients plan for progressively more stringent goals (such as net-zero carbon⁴). Sustainability-conscious firms often conduct this process during kickoff meetings and charrettes, establishing common goals to which the whole project team can commit. However, not all clients come to architects with an interest in sustainability.

How can architects work with each kind of client? The following table outlines several approaches for navigating this potentially delicate process.



Mark Kelly, AIA, and his team at BAR Architects were once struggling to engage an owner who was not interested in sustainability until the team framed energy performance measures (EPMs) in engineering terms as “optimizing systems.” The owner, who had an engineering background, then began to respond more favorably, and the project went from not pursuing sustainability at all to achieving LEED Silver certification and nearly LEED Gold.

⁴ As defined by the World Green Building Council, a net-zero building is one that is highly energy efficient and fully powered from on-site and/or off-site renewable energy sources.



Approaching different types of clients

WORKING WITH CLIENTS ALREADY INTERESTED IN SUSTAINABILITY

Consider efficiency measure options. Clients interested in sustainability may have already brought on a sustainability consultant. In this case, clients will likely have built the cost of common green building measures into their pro forma and understand the menu of measures they will be pursuing, based on their priorities.

Stretch sustainability further. Researching clients' sustainability commitments and addressing them during early discussions can help clients already on board go further. Architects can work with clients to consider more-stringent goals or building designs beyond current commitments or standards. For example, a LEED Platinum interior could be designed as "net-zero ready" so it can exceed current energy efficiency levels when the client and building owner are ready.

Show sustainability leadership. If clients have not hired a separate consultant for this process, a key opportunity exists for architects to help the project achieve a chosen building certification or implement an energy performance measure (EPM) that will reach the project's goals.

WORKING WITH CLIENTS WITH NO EXISTING INTEREST IN SUSTAINABILITY

Use the kickoff meeting to learn client objectives and values. Architects have to be skilled at finding the right framing for inspiring interest in energy efficiency and overlaps with client interests. Options include the following:

- **Increased asset value.** In some cases, embedding sustainability in buildings can represent a 50% or more increase in asset value over the lifetime of the investment and anywhere from \$0.50 to \$10 per square foot per year extra in net operating income.⁵
- **Tenant/employee comfort and health.** Energy-efficient spaces often lead to increased productivity and satisfaction. Studies show that a healthy high-performance building can be worth over \$10 per square foot per year to tenants in the form of reduced employee turnover and absenteeism, higher job satisfaction, and improved productivity.⁶ Health- and wellness-oriented upgrades and certifications (e.g., WELL or Fitwel) should be considered.
- **Evolving state/local regulations.** Increasingly aggressive climate legislation in cities and states could require costly upgrades down the line to meet carbon emissions/climate change regulations if clients fail to proactively start addressing efficiency now.
- **Client savings on operating and maintenance costs.** While upfront costs may seem high to some clients, they may change their minds when shown how the long-term savings outweigh the small increase in upfront premium.
- **Optimized systems.** Clients can avoid premature obsolescence of buildings and their systems by addressing efficiency now instead of being forced to undertake costly emergency whole-system upgrades in the future that could have been avoided.

⁵ Urban Land Institute, *Embedding Sustainability in Real Estate Transactions*, 2019.

⁶ Stok, *The Financial Case for High Performance Buildings: Why It Matters*, October 2018.



SAMPLE PERFORMANCE MEASURES

Sample energy-performance measures taken to improve efficiency in TEOP pilots include:

- High-efficiency lighting design and Energy Star equipment (often the two most effective measures for financial savings);
- Daylight harvesting;
- Optimization of HVAC systems; and
- Plug load control.

CONCEPTUAL FRAMEWORKS

Another strategy for goal-setting is the use of conceptual frameworks. AIA's [Framework for Design Excellence](#) organizes thinking, facilitates conversations, and sets meaningful goals and targets based on 10 measures of performance. Firm-specific frameworks are also an option. For example, Mithun uses a framework of its own design that covers six categories of sustainability, walking through it with clients as a means of setting goals.

Beyond the multiple benefits of pursuing efficiency, it is worth discussing with clients the nationwide increase in regulations for building performance. (See below, “Voluntary versus mandatory goals.”)

Ensure harmony between whole-building and tenant goals.

Moving into an existing building requires adapting to that

requirements—and not working against them. For example, large commercial tenants sometimes have floor plans predesigned for their operations, which can include lots of internal walls and heavy heating/cooling demands. These floor plans will present a significant barrier to overall building efficiency and related goals like improved daylight access and air circulation, which can make it difficult for base

pursuing sustainability voluntarily or meeting new legislative requirements.

Although tenants will need to meet their own companies' goals (e.g., financial, environmental, operational), there is significant value for architects and clients in collaborating with landlords to ensure that additional opportunities for efficiency are not missed and that the final designs

tenants will be able to maximize their space's efficiency if they align the density and openness of floor plans with the design and capacity of their buildings' central plant systems. This can present a great opportunity for architects to come up with floor plans that meet everyone's goals.

Voluntary versus mandatory goals: green building certifications, building codes, and beyond

Voluntary commitments and certifications such as the 2030 Commitment, LEED, Energy Star, Living Building Challenge, Green Globes, and BREEAM (Building Research Establishment Environmental Assessment Method) are gaining popularity with clients. Architects knowledgeable about these programs can explain them to clients and help them navigate the process, as well as set the stage for clients who would like to move toward those certifications.

Mandatory regulations, like local laws and building codes, are becoming increasingly strict regarding energy efficiency. For example, New York City's Local Law 97 of 2019 sets greenhouse gas emission limits for buildings over 25,000 square feet that must be attained by 2024 before they become tighter in 2030. Buildings over their limits will be fined \$268 for every extra ton of emissions. In California, 2019 state building codes require all new single-family and low-rise homes to be net zero energy-ready.

In addition, more than 50 municipalities are considering passing ordinances or local building codes that phase out use of fossil fuels for heating, cooling, and cooking in favor of electrification.⁷

New regulations usually directly affect owners, who often then pass through the costs of required upgrades and penalties for noncompliance to tenants. Architects with tenant clients in areas with such legislation can help clients meet tighter requirements; for clients in other areas, architects can help them get ahead of future regulation now to “future-proof” the value of their investment.

For more information on building-related climate legislation, see ULI's [Decarbonizing the Built Environment: 10 Principles for Climate Mitigation Policies](#). AIA outlines the opportunity for architects to deepen client relationships by being proactive about responding to new energy policies in the white paper “[Leveraging Energy Transparency](#).”

⁷ Building Decarbonization Coalition, *A Journalist's Guide to Building Electrification in California*, 2019.

Step 4: Model energy reduction options

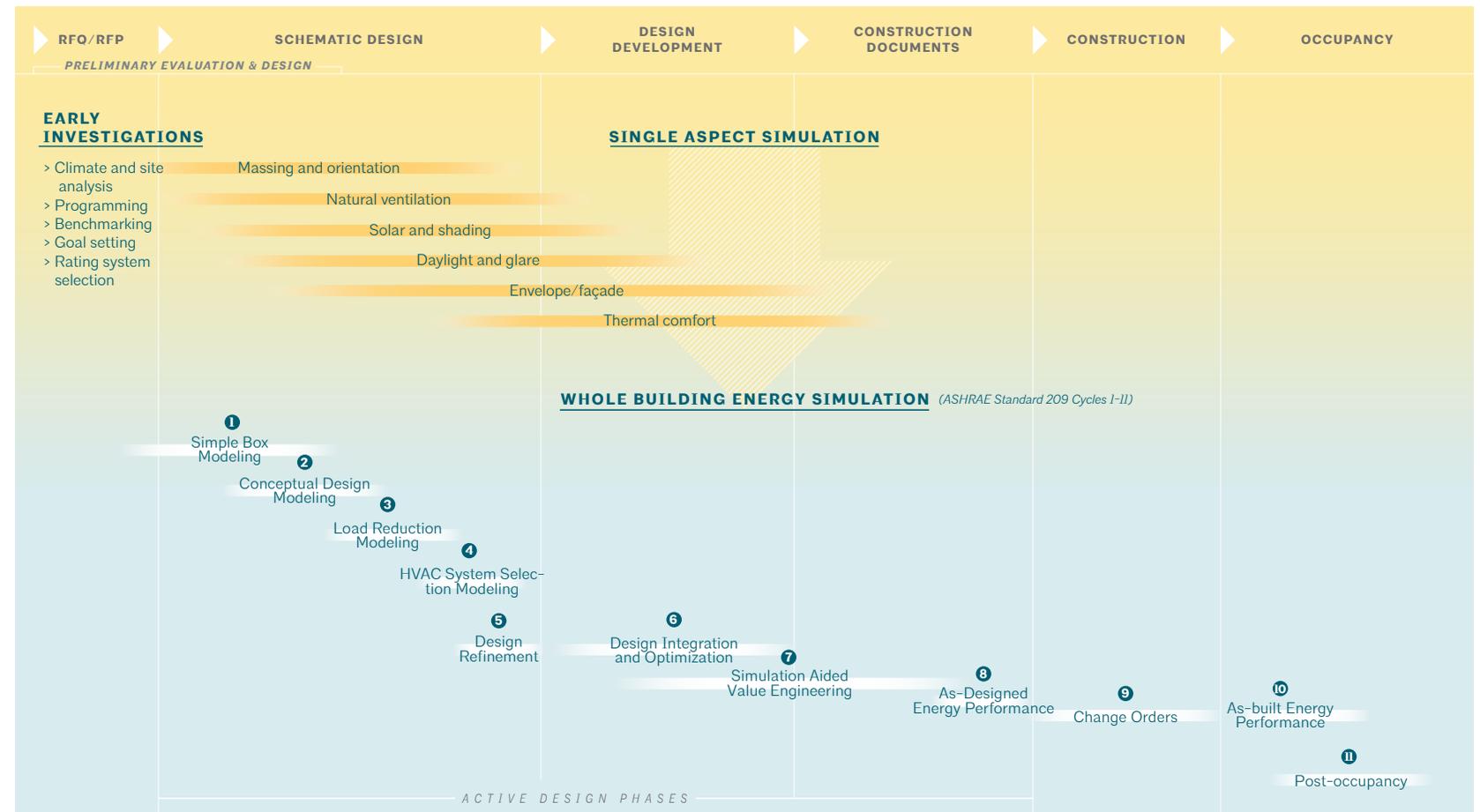
What do architects need to know about energy modeling?

Back up design with data.

Energy modeling—also known as building performance simulation—is at the heart of improving efficiency in whole buildings and in leased spaces. Energy-modeling software tests the impact of design strategies on reducing energy use within a building.

AIA's *Architect's Guide to Building Performance* is an essential, comprehensive guide to energy modeling and high-performance buildings. This resource is primarily geared toward new construction, but its guidance and principles can be applied to projects of all kinds—including interior fit-outs like TEOP projects.

As explained in the *Architect's Guide*, the modeling/simulation process simply measures the energy impact of standard design decisions. It helps project teams ask the right questions to iteratively test design strategies and optimize performance. In a



ASHRAE Standard 209 defines whole-building energy simulation in terms of 11 cycles that correspond to architectural design phases. Single-aspect simulations, performed or led by the architect, are important to inform the analyses performed in these cycles.



tenant improvement space, teams can simulate daylighting, ventilation systems, and controls, as well as test programming of complementary space types, like placing a server room beside an office space to use waste heat for thermal comfort. Modeling also can consider historical (and sometimes projected future) climate information such as current or future air temperatures, humidity, and wind speeds to ensure that buildings will be thermally comfortable for occupants. Project teams can follow the ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) new Standard 209 to ensure that building-performance simulation is applied effectively to optimize performance.

Though many architects already incorporate these factors—intuitively or by training—into “good design,” energy use can be counterintuitive, and designers cannot always predict how designs will stand up to an energy model. Modeling is therefore necessary to simultaneously optimize aesthetics and energy performance, thereby ensuring that design decisions meant to increase efficiency actually pay off.

Consider how your firm can integrate energy modeling.

Though it has become more common, there is a wide gap in how firms have mainstreamed energy modeling into their design process. Some firms use modeling on every project while many do not use it at all.

Some firms have in-house staff members who conduct early-stage basic modeling that is used—often at kickoff meetings or early charrettes—to show clients the potential financial savings from choosing efficient design strategies. Others work closely with the project team’s engineers from the outset, partnering to have a continuous dialogue that informs the inputs and helps explain the outputs of models to clients. Early modeling can be done with as much information as is available and can be iterated throughout the process as the design is refined to ensure that new ideas and more accurate information are incorporated.

Alternatively, clients can hire consultants who specialize in energy modeling to partner

with architects. Some use a software product—for example, the U.S. Department of Energy’s [COMcheck tool](#)—to model energy code compliance. Others use proprietary software to walk clients through the costs and payoffs of efficiency steps and make decisions together. This can be a more participatory model that better supports innovation and creativity than, for example, the more predetermined model of choosing among LEED’s preset options. This is a great strategy to use with more engaged clients.

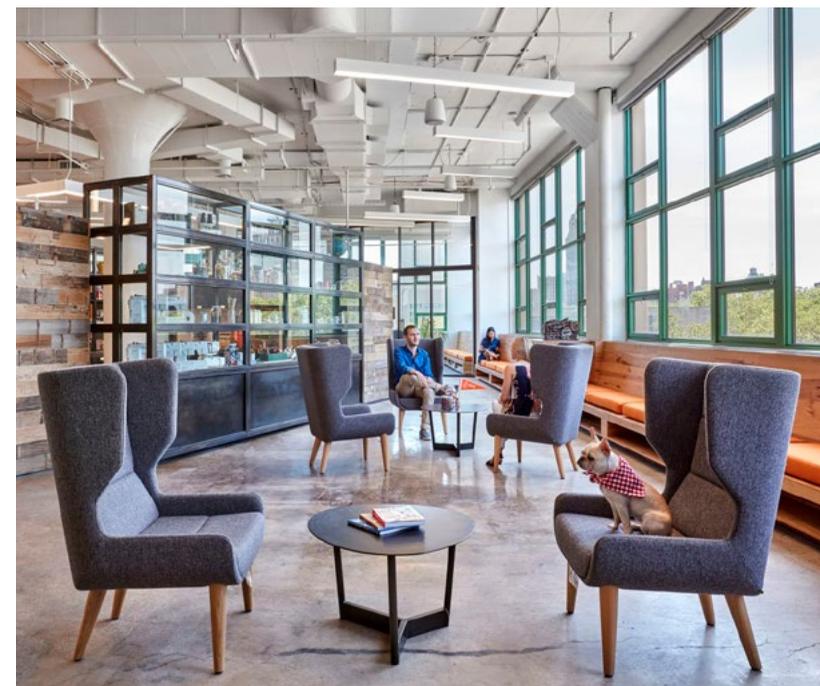
View menus of measures as decision trees, not shopping lists.

Energy modeling considers a range of possible choices to reduce a building’s energy needs. Often, due to financial constraints, not every energy performance measure (EPM) can be implemented immediately; in some cases, implementing certain EPMs can affect the need for or effectiveness of other EPMs.

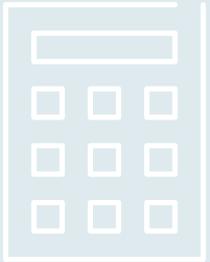
It is important for architects to be strategic with design suggestions and use modeling data to inform choices. Through modeling and

collaboration with other team members (e.g., engineers, lighting designers), architects can help set priorities based on how EPMs interact with one another. For example, daylight harvesting affects intensity of lighting needed for the space, while window-to-wall ratio and insulation affect the size of HVAC systems. The order of energy improvements is also important: if design begins with efficiency improvements to the

building envelope or insulation and lighting, a smaller HVAC system can be used, boosting efficiency and saving money. Be sure to also consider multiple redundant power systems that in the event of an outage could provide backup that allows continuous resilient building operation.



2020 COTE® Top Ten Winner, Etsy Headquarters, Photo credit: Garrett Rowland



Step 5: Calculate projected financial returns

How can the business case for energy efficiency be made effectively?

Combine energy and cost savings for a win-win.

As any architect can confirm, finding ways to save clients money is a big win. Fortunately, energy modeling software frequently also indicates cost savings. Thus, if architects are integrating energy modeling into projects, they can also communicate the financial returns of energy efficiency. Architects should ensure that they are still involved in the conversation when calculations (and final decisions) are made to help guide the process.

Overcome initial barriers.

Highly efficient systems often carry a higher upfront premium in return for lower long-term operating costs. Architects might encounter clients who are discouraged by the upfront costs before considering that they will achieve significantly higher savings in just a few years—well within the term of their lease length.

Which data points and explanations can architects use to help inform clients and push them toward sustainability? Several possible ways of approaching this conversation are included in [Step 1](#) and [Step 3](#) earlier in this document. Here are a few more:

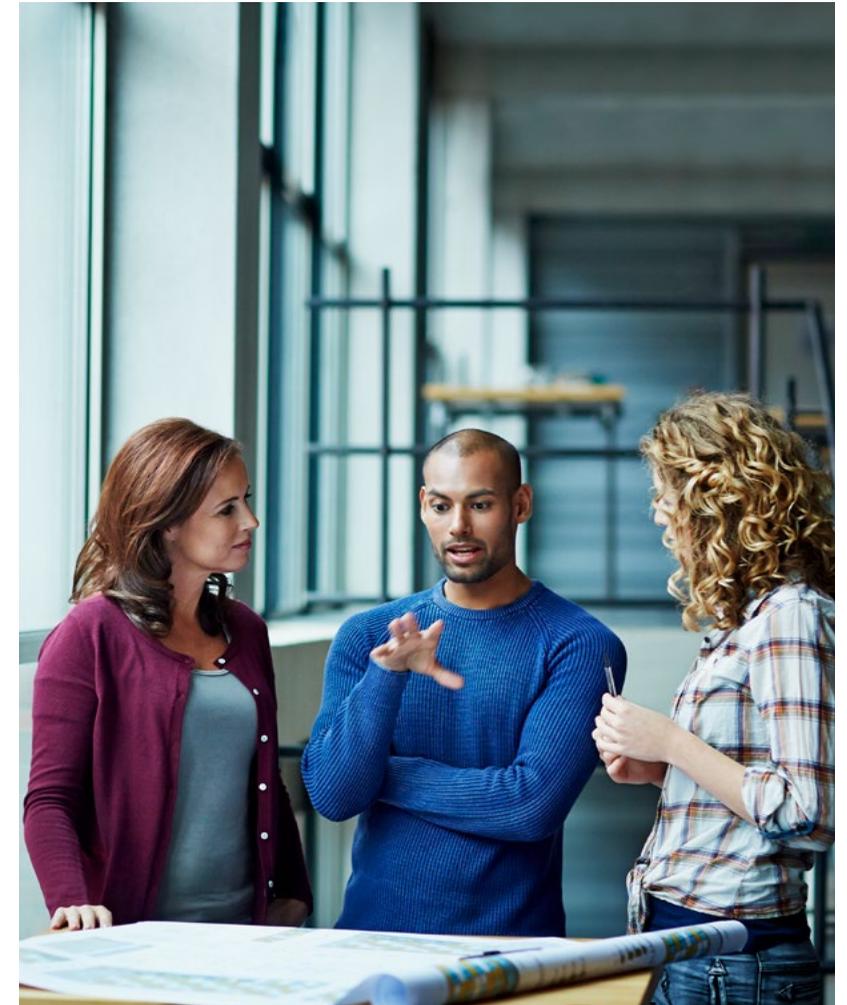
- Over the course of a 10- to 15-year commercial lease, the financial savings created by reducing energy use can reach hundreds of thousands of dollars, or more. See the [10 initial TEOP pilot projects](#) for examples.
- Hesitation by landlords to cover any additional upfront costs for efficiency can be dispelled through tenant/landlord cost-sharing agreements in green leases.
- Local or state utility incentive programs can usually be tapped to help cover upfront costs.

Highlight quick returns.

Of the 10 initial TEOP pilot projects with 30% to 50% energy savings:

- Seven had payback periods of under four years;
- Seven had returns on investment (ROI) of 100% or above; and
- Three had ROIs over 300% (the highest was 410%).

Tenants in a multitenant building can calculate the full value of these savings only if their spaces are submetered. Understanding tenant lease structures will help architects better articulate the potential for savings, and installing submetering along with signing a green lease will help the tenant maximize data transparency to understand the ROI of the investments.



Step 6: Make final decisions

How can architects ensure that the final design meets initial sustainability goals?

Facilitate and communicate.

Architects can play a key role in continuously guiding the conversation toward sustainability as decisions are made, because the final call usually rests with the tenant or construction contractor. To avoid important efficiency measures being value-engineered out of the final product, architects must be able to articulate the business case for sustainability. When goal-setting with clients, making sure energy goals are included in the Owner's Project Requirements (OPR) or Basis of Design (BOD) documentation will make it harder to value-engineer out EPMs.

Consider multiple priorities.

Architects can help weigh the benefits of different options. For example, while some elements of a high-performance space may not be as aesthetically impressive (such as ventilation systems), they can go a long way toward increasing efficiency.

Architects are uniquely positioned to contribute a balance of design aesthetics with building performance and can accommodate the client's proposed budget by prioritizing the most cost-effective efficiency measures.





Step 7: Develop an occupancy plan

What do architects need to consider about future use of a space?

Understand the projected patterns of occupation.

Architects should ensure that they know how tenants plan to operate and maintain the space. Ask about the intended use by and flow of occupants: in response to the energy use patterns and flow of occupants throughout the day, designs may need fine-tuning.

Conduct a pre-design survey.

A pre-design survey of future occupants' preferences for factors such as temperature and lighting can go a long way toward the design of systems that will function as intended and deliver on their potential for energy and cost savings. Automated systems that are sufficiently well tuned to occupant preferences to avoid manual adjustment (or even shutoff) are more likely to remain in use and efficient over time.

Do not forget to commission.

Commission lighting, HVAC, and energy controls to ensure that optimal settings for comfort and energy performance are in place and that the client's space performs as intended.





Step 8: Build out the space

How can architects make sure fit-outs are built as designed?

Ensure that the plan is enacted.

Architects are well-versed in overseeing construction. This step should be straightforward as long as the proposed and planned EPMs are integrated accordingly and not skipped during construction.

Bonus: Encourage sustainable construction practices.

Consider incorporating indoor air quality (IAQ) control measures for construction, such as insulating ductwork and performing a preoccupancy flush-out. Construction and demolition debris can also be recycled to avoid creating waste material.





Step 9: Execute the occupancy plan

What should happen after construction is complete?

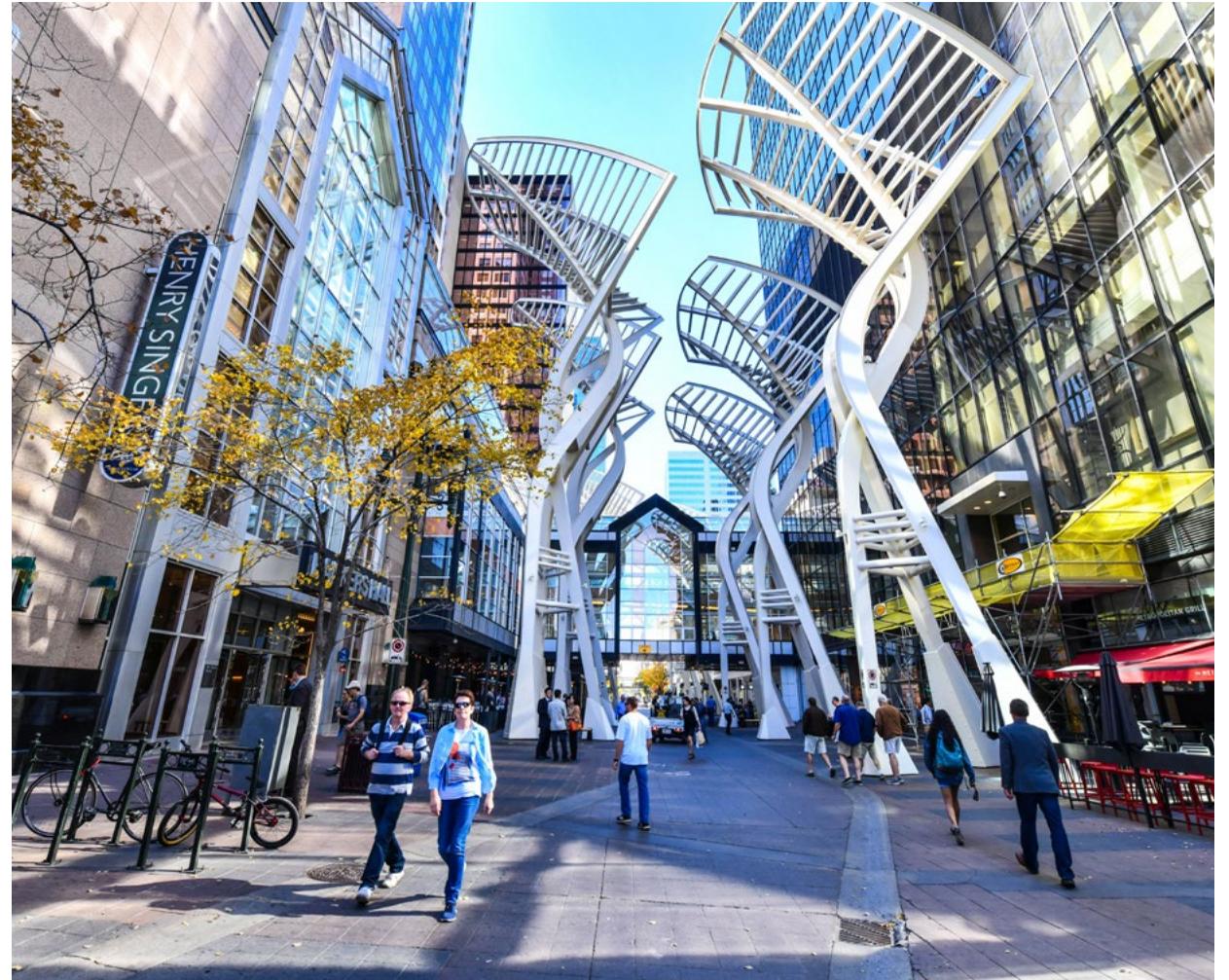
Provide education and information to future users of the space.

This is a great opportunity for architects to work with tenants/occupants and the rest of the project team to ensure that they know how to optimize efficiency, maintain occupant comfort levels, and save operating expenses. If possible, given the building's management system, consider creating a dashboard or employing a software program so users can monitor and potentially reduce their lighting and plug loads.

Refer back to the 2030 Commitment and encourage data sharing among architects.

A critical component of the 2030 Commitment, the Design Data Exchange (DDx) allows architects to track measured energy use once projects are completed, ensuring that energy goals are being met. Refer back to the goals set in [Step 3](#). Are these being

achieved? How can results inform future designs? Performance data, when shared on the DDx, can help inform design strategies and calibration of energy models for future projects of similar types, sizes, climates, etc. The DDx is valuable in part because it allows comparison across the industry in real time; thus, it is the architect's responsibility to report accurate performance data that can drive real improvements in sustainability rather than cherry-pick the impressive numbers.



Step 10: Communicate results

How should architects stay engaged with high-performance projects over time?

Keep the conversation going.

Communication among architects, tenants, and landlords/owners should not stop at project completion. To help inform future projects, all parties should come up with agreements ensuring that data and facts on use are shared.

Conduct periodic postdesign tenant surveys.

Consider conducting tenant surveys periodically (or, at a minimum, after one year of occupancy) to see whether the design goals were met and tenants are satisfied with factors such as temperature and lighting. Some architects and developers observe that supporting the health and well-being of employees—rather than perceived cost savings—is the main reason clients and tenants pursue efficiency. Getting data on how designs are achieving that goal can help make the case for future application of health-oriented solutions and suggest

whether systems need further optimization. Overall, tenant surveys are a human-centered supplement to quantitative energy data that can further demonstrate design successes and unearth potential problems and improvements.

Promote successful projects.

As results are proved over time, successes can be verified and shared through promotion by landlords, tenants, and architects. When permissible by the client, architects should develop case studies, articles, or other presentations that highlight their sustainable and energy-efficient design projects.



Sustainability resources for architects

What resources exist for architects to build their sustainability knowledge?

Credentialing: become an accredited green building professional and get access to training and support from certifying institutions.

Professional accreditations are distinct from certification programs for buildings. Well-known options include

- [LEED accreditation](#) by the U.S. Green Building Council (Green Associate or Accredited Professional)
- [WELL AP accreditation](#) by the International WELL Building Institute
- [Fitwel Ambassador](#) by Fitwel
- [Living Future accreditation](#) by the International Living Future Institute
- [Certified Passive House Consultant](#) by the Passive House Institute US (PHIUS)

AIA resources:

- [AIA+2030 online series and AIAU online courses](#)
- [Framework for Design Excellence resources](#)
- [Architect's Guide to Building Performance: Integrating Simulation into the Design Process](#)
- [“Leveraging Energy Transparency” white paper](#)
- [2030 Commitment resources](#)

ULI Greenprint Center resources:

- [Annual ULI Greenprint Performance Report](#) (accessible to ULI members)
- [Embodied Carbon in Building Materials for Real Estate](#)
- [Unlocking Hidden Value in Class B/C Office Buildings](#) (accessible to ULI members)
- [“Embedding Sustainability in Real Estate Transactions”](#)

Disclaimer

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is published and distributed with the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional person should be sought.

ACKNOWLEDGMENTS

We would like to thank the following architects and building experts interviewed for this resource for providing invaluable insight into their leading practice's process regarding sustainability: May So with Mithun; Mark Kelly, AIA, with BAR Architects; Heather Holdridge, AIA, with Lake | Flato; Rand Ekman, FAIA, with HKS; and Becca Rushin and Catherine Pfeiffenberger with Jamestown Properties. In addition, thanks go to Rives Taylor, FAIA, with Gensler, and Tate Walker, AIA, with OPN Architects, who reviewed this resource before publication.

About

About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of providing leadership in the responsible use of land and in creating and sustaining thriving communities worldwide.

More information is available at uli.org. Follow ULI on Twitter, Facebook, LinkedIn, and Instagram.

Urban Land Institute
2001 L St., NW, Suite 200
Washington, DC 20036-4948

About Greenprint

The ULI Greenprint Center for Building Performance is a worldwide alliance of leading real estate owners, investors, and strategic partners committed to improving the environmental performance of the global real estate industry. Through measurement, benchmarking, knowledge sharing, and implementation of best practices, Greenprint and its members strive to reduce greenhouse gas emissions by 50% by 2030. On an ongoing basis, Greenprint also endeavors to demonstrate the correlation between environmental performance and enhanced property value. Learn more at uli.org/greenprint.

About The American Institute of Architects

The American Institute of Architects (AIA) was founded in 1857 by 13 architects. Now we're more than 95,000 members strong. Headquartered in Washington, D.C., we have more than 200 chapters around the world. We advocate for the value of architecture and give architects the resources they need to do their best work. Our work drives positive change through the power of design.

American Institute of Architects
1735 New York Ave., NW
Washington, DC 20006-5292

About the 2030 Commitment

The mission of the AIA 2030 Commitment is to support the 2030 Challenge and transform the practice of architecture in a way that is holistic, firm-wide, project based, and data-driven. By prioritizing energy performance, participating firms can more easily work toward carbon-neutral buildings, developments, and major renovations by 2030.

More information is available at aia.org/2030commitment.

AUTHORS

Urban Land Institute

August Williams-Eynon, Senior Associate, Center for Sustainability and Economic Performance
Emily Pierce, Director, Greenprint Center for Building Performance

AIA

Paola Capo, Manager, Sustainability & Communities by Design
Matt Welker, Assoc. AIA, Director, Sustainable Metrics & Operations