

# AIA Practice Management Digest – April 2017

[network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/aia-practice-management-digest-april-2017](http://network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/aia-practice-management-digest-april-2017)

## Greening your practice

### Letter from the Editor

By Seth Anderson, AIA

As AIA members, we have an obligation to advance the policies of the institute. This includes the statement: “The creating and operation of the built environment require an investment of the earth’s resources. Architects must be environmentally responsible and advocate for the sustainable use of those resources”. This policy reinforces the positive effect that architects can have on energy conservation and “the design, preservation and construction of sustainable communities and high-performance buildings.”

Going beyond our membership duty to the Institute, there are also many reasons to embrace the ideals of sustainability in the operation of our businesses. The three that stand out for me as a business owner are brand identity, efficiency, and resilience.

For this edition of the *Practice Management Digest*, we have selected articles that present the business case for embracing sustainable business practices and highlight several new opportunities to incorporate sustainability into our building projects. Julia Craighill starts off the discussion in the article “So why bother going green? What’s the actual business case?” with the idea that sustainable business practices will help your brand, engagement and efficiency.

If you’ve looked around your office recently, you’ve probably noticed a thing or two that could be thrown out... uh, I mean recycled. Imagine having to pare down 30 years of accumulated office materials in preparation for the move to a new building. Jennifer Letz describes her experience in doing just that in “Embracing the Urge to Purge” while also diverting a significant quantity of these materials from the landfill.

Stephanie Horowitz, AIA, a member of the AIA Committee on The Environment (COTE), contributes her article “How small firms can go green”, which identifies resources for firms starting to incorporate sustainable building design into their practice. And for those firms that have already embraced the green wave, the article “Design Features and Analytics for Greener Buildings” by Zack Moore, offers tips on maximizing return on investment for our clients through benchmarking and monitoring.

How can a building’s lighting improve space utilization? Jonathan Weinert’s article “Sustainability and the second great lighting revolution” takes a futuristic look at how LED lighting networks, combined with the Internet of Things, can improve lighting efficiency, while quantifying and helping to reduce the physical real estate needed.

In an ongoing effort and collaboration with AIA Trust, also included is the article “Exploring the Opportunities and Risks in the Materials Transparency Movement” by Kevin J. Collins, which identifies risks associated with the movement that encourages disclosure of the material content and chemical makeup of building materials used in building construction.



I hope you enjoy this quarter's edition of *Practice Management Digest* and find ways to make your own business more sustainable from the perspectives of people, planet and profit.

## Features

### [So why bother going green? What's the actual business case?](#)

*By Julia Craighill, LEED BD+C*

There is considerable business value to integrating sustainability considerations your business, but before your company commits the necessary time and resources, you must first ask—Will this be worth the effort? Does it make business sense for our firm to consider sustainability in how we operate and the services we provide?

### [Embracing the urge to purge: Tips to ensure a clean and green office move](#)

*By Jennifer Letz*

Even in an age of electronic everything, our propensity to collect and stash material objects is only rivaled by the wildest of desert pack rats. So how do you get all of this “stuff” to leave your workplace? And, more importantly, how can it be done successfully without adding more trash to our environment? Here's how I answered these questions.

### [How small firms can go green](#)

*By Stephanie Horowitz, AIA*

Developing in-house expertise in the area of high-performance buildings can be a challenge for small firms, especially when you're starting from scratch. Here are some suggestions for professional development that can help your firm bulk up its in-house expertise on green design.

### [Exploring the opportunities and risks in the materials transparency movement](#)

*By Kevin J. Collins, RPLU, Associate AIA*

Are you engaged with the movement towards material transparency? With proper contract language and client communications, design firms can promote the evolution of safer products through the materials transparency disclosures without increasing their professional liability exposures or business risks.

### [Sustainability and the second great lighting revolution](#)

*By Jonathan Weinert*

While the majority of architects and workplace designers agree that space optimization and energy efficiency are two of the most important aspects of sustainability initiatives, most don't think of looking up to the ceiling overhead. In the U.S., lighting accounts on average for about 17% of a building's total energy consumption, more than any other end use.

### [Design features and analytics for greener buildings](#)

*By Zack Moore*

Whether designing new buildings or redesigning existing buildings, architects can contribute to future energy savings and certifications for a client. Here are some tips to maximize the return on investment on your efficiency efforts for your clients.

## **Further reading and resources**

## **Contribute to the Digest**

The next issue of the *Practice Management Digest* will dive into “Pro-bono work/public interest architecture: Socially conscious design and how architects can give back to the community”

We are always looking for topics that you would like to see addressed in an edition of the *Digest*. If you have topics related to practice management that you'd like explored or articles you would like us to consider, please contact Seth Anderson, AIA, at [sanderson@ascentarch.com](mailto:sanderson@ascentarch.com).

# So why bother going green? What's the actual business case?

[network.aia.org/blogs/julia-craighill/2017/04/03/so-why-bother-going-green-whats-the-actual-business-case](https://network.aia.org/blogs/julia-craighill/2017/04/03/so-why-bother-going-green-whats-the-actual-business-case)

By Julia Craighill

Sustainability has become a buzz word, often dismissed as a trend nowadays. There is evidence, however, that there is considerable business value for companies that integrate sustainability considerations into the fabric of how and why they operate their business.

But before a company commits time and resources into the planning and strategizing necessary to truly achieve sustainability integration, one must first ask—Will this be worth the effort? Does it make business sense for our firm to consider sustainability in how we operate and the services we provide?



## What is sustainability and how do we achieve it?

While the Brundtland sustainability definition of meeting the needs of the present while ensuring that future generations can meet their own needs endures, I like Sustainability Roundtable's version of corporate sustainability as "a more strategic approach to business innovation and optimization in a world of rising resource constraints." Simply put, it's opportunity hiding in plain sight.

In the building industry, sustainability is usually relegated to green building – attributes of the buildings we create. However, no business can successfully have sustainability in the products or services they provide without systematically linking considerations of the Triple Bottom Line, namely People, Planet, and Profit, in their business decisions.

## BEE

I have codified the many benefits reaped by companies that consistently manage human, environmental, and financial capital into **BEE**, which stands for Brand, Engagement, and Efficiency.

The acronym BEE is a double-entendre. It references bees, which play an essential role in plant fertilization and seed development by cross-pollinating. Without bees, our food chain would collapse. Similarly, sustainability has multiple cross-cutting benefits that promote business health and growth.

## B – Brand

Brand is your reputation – the perception customers have about your company. Customers connect to your brand, not your business. Having a green consciousness gives **clarity** to your company's vision and values, making a strong statement that people identify with and appreciate.

Sustainability creates **market differentiation**. Most companies are focused on “value”, “cost-effectiveness”, “quality”, and “performance”. But sustainability goes further, connecting your company’s “what”, “how”, and “why” to the needs and desires of the larger world. It gives purpose to your brand, and benefits its reputation.

Sustainability also ensures **market relevancy** in today’s world of evolving priorities. While social responsibility and sustainability might have seemed like nice to-dos just a few years ago, it’s increasingly expected that business practices demonstrate these values.

## **E – Engagement**

Engagement follows closely on brand. Once you have clearly articulated your sustainability purpose and aligned it with your business processes, people are motivated to support and learn about your brand, both internally and externally.

Internal to an organization, **talent attraction, retention, and productivity** are the main reasons given for having a sustainability focus. More and more young professionals want to work for organizations that share their values. Instead of just competing on wages, firms are also appealing to and retaining staff based on their practices. Further, employees that are engaged with a company contribute more to the bottom line and often create product and process improvements.

Externally, engaged **customers are more likely to buy** from and be loyal to a company they like and feels familiar.

Furthermore, external **stakeholders**—such as suppliers, customers, investors, regulators, communities, governments, and advocacy groups—can **provide insight** into trends, market developments, and strategic opportunities.

## **E – Efficiency**

Those first to market with an innovation or skill get the recognition. This **first-mover advantage** also means they are well positioned for incentives or green procurement opportunities.

A company that defines sustainability objectives for their products and services right from the start minimize back-tracking on decisions. This results in greater cost control and **minimized cost-uptick**.

There is a vast risk landscape facing the building industry including: increasingly stringent regulations, rising resource costs, global instability and supply-chain vulnerability, natural disasters and extreme weather, and health implications from material toxicity. It’s not hard to see the benefit of **risk mitigation** accruing to companies that are engaged with stakeholders and actively adjusting for environmental and social impacts.

Perhaps the greatest value comes with changes to internal processes. Just as green building certifications, such as LEED®, have shown the need for integrative design, implementing sustainability initiatives leads to greater collaboration and accountability within a company itself. Business practices must be re-examined, which leads to **process optimization and quality assurance**. Circling back to the BEE analogy, functional silos will break down allowing cross-pollination to flourish.

## **Green Building Results**

For those firms that focus on sustainability, the result in their green building portfolio can be significant. After all,

beyond saving money by using less resources, green buildings are setting **asset value** records.

In 2014 alone, two LEED-Platinum office buildings set resale records. PNC Place, designed by Gensler, was the first office building in Washington, DC to break the \$1,000/sf barrier when sold. Similarly, 300 N. LaSalle, designed by Pickard Chilton, became the largest single-building office sale in Chicago history. The former owner noted, “The asset has performed extremely well, which only underscores its enduring quality.”

The fact that these green buildings retained their asset value during resale is a convincing argument you can highlight to your clients in the development community.

## **Conclusion – Lessons Learned**

Sustainability is the inevitable future. We are in a time of depleting resources coupled with increased population and consumption. The building industry has enormous ecological impacts and the need to conduct business in an environmentally responsible manner is increasing. You can treat this pressure as an opportunity or a threat, but ignore this sea-change at your own risk.

Those companies that invest in strategy and pursue excellence within the context of the Triple Bottom achieve long-term business value with better processes, culture, and services.

## **Footnotes:**

- [Corporate Sustainability Growth Driven by Financial Impact](#), Sustainability Roundtable blog post, Feb 28, 2017
- [KBS Sells 300 N. LaSalle for Record \\$850 Million](#), CoStar news, July 8, 2014
- [A new record: PNC Place sells for \\$1,075 a square foot](#), Washington Business Journal, Oct. 27, 2014

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*Julia Craighill, RA, LEED BD+C, founded Ensign Consulting in 2013 to help companies that want to launch and grow green programs or need a plan to ensure that they will withstand changes in the future. With awards from both USGBC and AIA, she has been an appointee on several government task forces and frequently speaks on the merits of corporate sustainability.*

*Using her experiences from a 30-year career within the architecture, construction, green building, and sustainability industries; she identifies the specific systems that need to be implemented by an organization to transform its mission and values into actionable business practices that link People, Planet, and Profit. She has coached and assessed over 30 businesses as consultant for the Montgomery County Green Business certification program.*

[\(Return to the cover of the 2017 PM Digest: Greening your practice\)](#)

# Embracing The Urge to Purge: Tips to Ensure a Clean and Green Office Move

[network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/embracing-the-urge-to-purge-tips-to-ensure-a-clean-and-green-office-move](https://network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/embracing-the-urge-to-purge-tips-to-ensure-a-clean-and-green-office-move)

By Jennifer Letz

Spring has finally sprung, and with the return of warm breezes and showy tulips, so returns our primal urge to purge everything that has accumulated in our workspaces since we set the clocks back. Even in an age of electronic everything, our propensity to collect and stash material objects is only rivaled by the wildest of desert pack rats. Whether you have a light spring cleaning in mind or a large-scale office move on the calendar, every work environment will need to embrace a downsizing event at some point.

So how do you get all of this “stuff” to leave your workplace? And, more importantly, how can it be done successfully without adding more trash to our environment? A few years ago, I was faced with these same questions when I was assigned to my employer’s Move Team, a group of employees designated to orchestrate an office move of over 100 employees to a nicer – but smaller – building. Management made it crystal clear that storage was at a premium in the new facility and employees must downsize or risk working in a cubicle resembling a packed storage unit.



## Organizing a purging event

As the organization’s sustainability specialist, I perceived this call to “reduce” as a perfect opportunity to incorporate its partners in crime: “reuse” and “recycle.” To make this downsizing effort a success, a highly organized purging event was required.

The first step was to set official purging dates so employees knew to block out time for cleaning out their workspaces. Next up was contacting local waste haulers to order extra roll carts and a 20-yard dumpster exclusively for paper and cardboard. I reserved a conference room for the entire event so it could serve as the base camp for collecting and sorting. In this room, I began designating tables and floor space for every kind of item one could find in an office (spoiler alert: it’s way more than you can imagine). And a team of volunteers – mostly members of our office Green Team – signed up to staff the recycling room for a few hours at a time each day.

The final act was the most crucial. Recognizing that my co-workers may be very skilled in their respective fields, but weren’t waste management experts, I by-passed attempting to coach them about recycling specifics. Instead, I simply removed all the trash and recycling cans from the building the day before the purge was to begin. Every unwanted item would have to come through our recycling room and be sorted by myself or a volunteer. Drastic? Maybe. Effective? Definitely!

## The day of the purge

When we finally opened for business, we were greeted by our co-workers sporting dubious looks and armfuls of workspace detritus. Our volunteers took each visitor on a tour of the room and assisted them in sorting items. Once employees experienced the operation in action, they were quick to return with more items. Some would even go shopping, perusing the abandoned items and picking up a few pens or books. Others just marveled at how we could have accumulated so much stuff – a powerful reminder of the side effects of our material world.

Downtime was spent testing every pen and marker, wiping down binders, and adding new labels to file folders to cover up their former names. While it may seem a waste of time to tackle such menial tasks, this was actually the crucial step in the “reuse” phase of the purge. If these items were to compete with new items on the supply room shelves, they needed to be equally trustworthy and clean. It’s human nature to be attracted to shiny, so shining we did!

### **So what happened?**

After many days of sorting and recycling we shut our doors and tallied the results. The numbers were astounding - 36 roll carts of recycling left the building accompanied by only two roll carts of trash. Ten boxes of electronics and media were delivered to specialty recyclers. Almost 400 binders were collected (half we kept, half donated to the local school district), and thousands of other office items (folders, binder clips, pencils, etc.) were organized and sent to the new supply room ready for the next project.

In total, over 90% of items brought into our pop-up recycling center were diverted from the landfill, which equated to a significant savings in avoided waste hauling costs and recovered office supplies. But more importantly, this hands-on event had a palpable impact on employees by changing their viewpoints on consumption and waste. Many committed to making more mindful decisions about their purchases in the future.

So whether you’re considering a spring cleaning day or orchestrating a major office move, thorough pre-planning, careful sorting, and a kung-fu grip on controlling all waste streams will ensure a successful clean and green event.

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# How small firms can go green

 [aia.org/articles/16496-how-small-firms-can-go-green](https://www.aia.org/articles/16496-how-small-firms-can-go-green)

By Stephanie Horowitz, AIA , August 29, 2016

## These resources can help a small firm develop high-performance know-how

Developing in-house expertise in the area of high-performance buildings can be a challenge for small firms, especially when you're starting from scratch. Here are some suggestions for professional development that can help your firm bulk up its in-house expertise on green design.

### Building science 101

For starters, tap into the free resources from [Building Science Corporation](#) (BSC). They offer amazing articles that range from wall section basics to the potential pitfalls of insulating historic brick façades. BSC also offers [in-person seminars](#) throughout the country on various topics; Dr. Joseph Lstiburek's are particularly entertaining and insightful.

### Net zero homes

If you practice in a cold climate, seek out Marc Rosenbaum's [online classes on Heat Spring](#). He is an engaging speaker with a deep knowledge of high-performance homes and buildings. The self-paced class provides great instruction, follow-along information resources, and access to feedback directly from the instructor. One of our project managers found these courses helpful in making the switch from commercial to residential projects. Marc also offers a class on [deep energy retrofits](#) (super insulating and air sealing existing buildings).

### Passive House

This isn't for novices. Passive House (or [Passivhaus](#)) is gaining traction in the US as an aggressive energy standard for new and existing homes and buildings, offering thermal comfort, resilience, and minimal energy bills. Unlike LEED, Passive House is a performance-based standard focused solely on energy performance, so no checklists here. Notable projects range from single-family homes to the residential high-rise on the Cornell Tech campus in New York. The [Passive House Institute US](#) and [Passive House Academy](#) both offer educational opportunities; among other things, I learned a new appreciation of detailing related to both thermal bridges and air barriers.

### Energy modeling

Energy modeling benefits the individual project as well as your firm. By modeling your projects, you can compare them and begin to discern the influence of design on energy performance. To model at a firm level, join the [AIA 2030 Commitment](#). Its [AIA 2030 Design Data Exchange](#) tool will allow you to see how your projects stack up to similar endeavors; all the information is anonymous.

[Architecture 2030](#) suggests a basic energy model from the EPA called [Target Finder](#). If you're looking for an in-house energy model for a residential project, try [REM/Design](#); they have a 90-day free trial available. [Sefaira](#) has been also popular as an in-house model for my colleagues who focus on nonresidential work. They offer a plugin for both Revit and SketchUp.

### Resilience

When it comes to resilience, start a conversation. A colleague at [Perkins+Will](#) described a practice at her firm: each year, they ask the following three questions (paraphrased below) of each of their projects:

- What is the climate projection for the region?
- What stresses does this create for your building/community?
- What is your project doing about it?

Start there and you'll be on the right track.

If you have other resources that have proven beneficial, contact us at [@AIA\\_COTE](#) on Twitter or share them with the hashtag [#GoingGreen](#).

*This article originally appeared in the [July issue](#) of the Committee on the Environment's e-newsletter. Visit the AIA's [Committee on the Environment \(COTE\) homepage](#) for more.*

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# Exploring the opportunities and risks in the materials transparency movement

[network.aia.org/blogs/kevin-collins/2017/04/03/exploring-the-opportunities-and-risks-in-the-materials-transparency-movement](http://network.aia.org/blogs/kevin-collins/2017/04/03/exploring-the-opportunities-and-risks-in-the-materials-transparency-movement)

By Kevin J. Collins, RPLU, Associate AIA

Material transparency refers to an advocacy movement that promotes requiring manufacturers to fully disclose the material content and chemical makeup of building materials used in construction of the built environment in reference to a pre-determined list of substances which have been identified for potential harmful human health and environmental impacts.

Requiring materials transparency encourages product manufactures to divulge the contents of their products to allow for assessment of the potential lifecycle health and environmental impacts posed by the use of the products. Product content information is useful for making choices based on the impact of the product throughout its entire lifecycle. And with disclosure, many manufacturers are reconsidering their formulations, redirecting their supply chains, and creating less-hazardous alternative to their existing products.



## Recognizing the movement and the professional response

The movement to promote the disclosure of the contents of building materials and the related potential health and environmental impacts has been growing as some clients express a concern that certain substances be eliminated from consideration for their projects. In addition USGBC's current LEED rating system includes optional credits for collecting product environment and health information. Other rating systems and voluntary standards for the design and operations of buildings reference health product disclosures and other specific requirements. Thus for clients that care about such third-party validations, the existence of disclosure information becomes important.

The movement received additional support in 2014 when The American Institute of Architects approved a policy statement to address and encourage materials transparency. The AIA pronouncement states that the architect should be environmentally responsible and that, because building materials impact the environment and human health "before, during, and after their use," knowledge of the lifecycle impacts of building materials "is integral to improving the craft, science, and art of architecture." The AIA position on materials transparency is suggestive of several ways that architects are encouraged to respond to the ethical imperatives for materials transparency – the AIA code of Ethics and Professional Conduct includes an obligation that AIA member should be environmentally responsible and advocate for sustainable buildings.

While the advancement of professional ethics seems to be one goal of the AIA public policy, it also recognizes that the materials transparency movement represents an opportunity to give design firms a competitive advantage, tap their "thought leadership" and stimulate design innovation.

## Addressing the service and risk through contract language

Absent specific contract language, the design firm's involvement and reliance on the manufacturers' disclosure documents will be judged in relation to the standard of care for the professional services performed. The question to be addressed is whether the actions and services of the design firm were consistent with what is generally accepted as being within their professional expertise and training. Design firms, of course, can negate the protection of the standard of care by contractually agreeing to provide a level of assessment that is not expected by the standard of care. The contractual obligation might extend to services the firms are incapable of providing.

The AIA Contract Documents program worked with a special AIA Materials Risk Taskforce and the Materials Knowledge Working Group to develop guidance or model language so that the duties of the architect are clearly articulated and, therefore, limited. That language is included in AIA B503, a document available on the AIA Contract Documents website. The program created model language to address the potential use of environmental and health product disclosure documents in providing architectural services.

The AIA Contract Document program's suggestion is for increased communication and specific contract language to reduce the design firm's potential liability associated with materials transparency. But while a carefully crafted professional services agreement can clarify the role of the design firm, it cannot, by itself, protect against third-party claims. And when health and environmental aspects of building products and materials become an increasingly important factor in the specification process, the likelihood of a third-party claims based on the increase duty increases.

### **Clearly communicating the services provided**

It is important to minimize a firm's business risk and to assist it in avoiding professional liability claims that a design firm's contract states the reasons for seeking disclosure of product content information so that the firm, its client and any third-party attempting to place on the firm responsibility for specifying products the third-party might consider harmful have a clear understanding of the role of the design firm. In many situations where the design firm is only relying on stated manufacturer information, it makes sense for the firm to disclaim any responsibility for any detailed chemical or toxicological assessment of the product or material content information that impacts the actual environmental or health impacts of the materials or products.

Product content and composition is only one factor among many that a design professional considers before recommending to the client the use of a product, material, or system. Project owners have to be made aware of the considerations that go into the specification process. Design firms cannot – and should not – allow their clients to assume that a design professional is able to step into the role that is more appropriate for a properly credentialed professional such as a toxicologist, industrial hygienist, or health care professional in evaluating or verifying manufacturer-provided information on the environmental or human health aspects of a specific product. But with proper contract language and client communications, design firms can promote the evolution of safer products through the materials transparency disclosures without increasing their professional liability exposures or business risks.

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*Victor O. Schinnerer & Company, Inc. and CNA work with the AIA Trust to offer AIA members quality risk management coverage through the [AIA Trust Professional Liability Insurance Program](#) , [Business Owners Program](#) , and [Cyber Liability Insurance](#) to address the challenges that architects face today and in the future. Detailed information about both these programs may be found on the [AIA Trust website](#) .*

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# Sustainability and the second great lighting revolution

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By Jonathan Weinert

More and more companies are using the ESG model—environmental, social, and governance—to define their sustainability objectives and measure sustainable business value. [1] The ESG model is especially useful to remind decision-makers that sustainability has several dimensions that extend beyond energy efficiency, including environmental stewardship, climate change mitigation, social responsibility, and ethical governance.

Facilities managers and building owners can often make quick but significant progress toward their sustainability goals with digital and connected lighting systems. While the majority of architects and workplace designers agree that space optimization and energy efficiency are two of the most important aspects of sustainability initiatives, most don't think of looking up, to the ceiling overhead—even though they might find many of the solutions they're looking for there.



In the U.S., lighting accounts on average for about 17% of a building's total energy consumption, more than any other end use, [2] so using LED-based, digital luminaires and controls instead of conventional incandescent and fluorescent luminaires has become something of a no-brainer for organizations who aim to minimize their environmental impact. Simply "LEDifying" the lighting in a building—replacing conventional light points with properly designed LED light points—can reduce lighting-related energy consumption by 50% or more. [3] The addition of standard controls, from motion detectors to simple timeline-based lighting schedules that lower lighting levels during non-working hours, can raise this number by one or two dozen additional percentage points.

The viability and energy advantages of LED lighting are now well understood, and have been for almost a decade already. The revolution has become the status quo. Even though much existing corporate real estate has yet to make the switch, industry analysts expect that 48% of all general illumination lighting will be LED-based by the year 2020, increasing to 84% by 2030. [4]

## The illuminated IoT: the second great lighting revolution

But there's a second revolution underway, one that builds on the digital nature of LED lighting. This second revolution may be even more disruptive than the first, and may require an even more wholesale rethinking of lighting and its relationship to architecture, building management, and workplace design. As compensation, this second revolution promises to deliver benefits across the entire ESG spectrum.

This second revolution is the connected lighting revolution. Connected lighting is the convergence of digital lighting technology with information and communications technology. In practice, this means enabling LED luminaires with two-way data communications, usually over an IP connection, and deploying them in a building-wide system that includes sensors, location beacons, and wireless communications.

If you're conversant with the Internet of Things, this ought to sound familiar. A system of connected luminaires that

can share data about their status and operations with a software management back-end is a good example of what GE has called the Industrial Internet of Things (IIoT). “The industrial Internet draws together fields such as machine learning, big data, the Internet of things and machine-to-machine communication to ingest data from machines, analyze it (often in real-time), and use it to adjust operations,” runs the definition developed by GE’s R&D division in the early 2010s. [5]

### **Making lighting operations optimally efficient**

Connected lighting affords several advantages for more efficient lighting operations. Software-based lightpoint control gives building managers the ability to zone and group lights to whatever degree of granularity makes sense for the workplace layout, and change the zoning easily whenever the floorplan changes. Dimming schedules can also be much more granular, delivering light levels where and when needed. Since connected luminaires share data about themselves, they can be monitored in real-time, or near real-time. Building managers can receive automatic and data-rich alerts about outages and other service interruptions, making lighting system management much more efficient and cost-effective.

Sustainability advantages proliferate when the lighting system is reconceived as a convergence point for multiple building services, and as an enabling platform for smart applications that go beyond illumination. Connected lighting brings together many elements that are already present in corporate workplaces for other reasons, offering an apt and relatively easy pathway to advanced applications. Lighting is essentially everywhere that people are in a building, it already has power and, if it’s LED, it’s already digital. (LEDs are chips that sit on top of circuit boards, and LED luminaires typically have some computational capabilities on board—for instance, for power conversion, commissioning, and receiving and responding to lighting control commands.) A professional building likely already has an IP backbone that supports a ubiquitous IT network, and building service systems, such as HVAC, security, scheduling, and so on must already be in place.

If IP communications are added to the electronics already on board in LED luminaires, the lighting system effectively becomes a distributed computing platform covering every area of the building that people work or go. This distributed, connected system can host sensors of every conceivable kind—motion, occupancy, proximity, daylight, temperature, humidity, you name it—without requiring building managers to install a separate physical and communications infrastructure. Similarly, the lighting system can host location beacons and wireless communications, for deploying indoor positioning and location-based services to users of the building’s illuminated spaces.

### **New connected applications**

The applications enabled by such a “digital canopy” are legion. Sensor networks distributed throughout the building give facilities managers detailed data on occupancy patterns over time. Software-based dashboards and analysis of this data allows precise targeting of light levels and dimming schemes, ratcheting up the energy savings for lighting to 80% or more over conventional solutions.

This same detailed, historical occupancy data can also help building managers crack the space optimization nut. Because it can lower a company’s real estate footprint and minimize the resources consumed in supporting its workforce, space optimization is often considered the Holy Grail for achieving environmental stewardship and climate goals, especially in the existing built environment. [6]

The biggest challenge facing organizations who want to optimize their workspaces is how to gather the relevant data. A sensor network that automatically gathers occupancy and activity data has obvious advantages over the traditional method—having people walk around with clipboards and make occasional eyeball assessments. In fact,

only the sort of continuously collected, whole-area data that a sensor network provides offers the level of insight that organizations can use to implement effective space optimization measures. [7]

This is more than theoretical. With a connected lighting system, Deloitte, the flagship tenants at the hyper-sustainable office building The Edge, in Amsterdam, reduced the square meters per employee from 12.6 to 7.6 over the first twenty months of operation, saving the company over €3 million per year and allowing them to consolidate operations on three floors instead of the originally designated five. Reducing the overall real estate footprint in the building not only benefitted Deloitte with significant operational cost efficiencies, it also reduced their carbon footprint, allowing the company to support more employees while doing its part for the environment.

Connected lighting offers additional value when used as a convergence point for multiple building services. Akshay Thakur, Business Development Manager in the IoT/IoE Vertical and Solutions Group at Cisco, sees digital lighting as the first step to creating a “digital ceiling”—a secure infrastructure of intelligent illumination, sensing, and communication devices installed overhead and integrated into a common data network that manages all building services. According to Thakur, businesses must embrace digitization to achieve operational efficiencies via automation, deliver personalized employee experiences, and lead to innovation and new ways of working. [8]

### **Fulfilling social obligations as well as environmental goals**

Deloitte increased its on-site workforce from 1,740 FTEs to 2,900 FTEs, while cutting the designated square meters per FTE almost in half—and they did so without compromising employee comfort and satisfaction. In fact, employee comfort and satisfaction *increased*, reflected in part by a fourfold increase in job applicants at the location over the time period measured. Personalization applications enabled by the connected lighting system—for instance, giving employees control over the lighting above their desks, as well as the local heating and cooling—allow Deloitte to offer its employees an attractive, responsive work environment.

Such connected applications help companies like Deloitte fulfill their social obligations, as well as their environmental goals. According to Prologis, a global leader in industrial logistics real estate in the Americas, Europe, and Asia, “being socially responsible includes providing a challenging and dynamic work environment that supports the professional development and personal lives” of workers. [9] A smart building, enabled by a converged connected lighting platform, can advise its occupants, rather than the other way around, creating an intelligent, streamlined work environment that can anticipate and seamlessly fulfill the needs and preferences of employees.

### **How to do it**

All well and good—but how does an organization implement a connected lighting system and the smart applications it supports? More urgently, how can an organization acquire and deploy the technology needed without breaking the bank?

As always, new builds and retrofits pose distinct challenges that must be addressed in different ways. While both require a new level of collaboration among architects, lighting designers, IT, HR, application developers, system integrators, and others, technology innovations and innovative business models clear the way for retrofitting existing workspaces.

Power-over-Ethernet (PoE) enabled LED lighting fixtures are especially promising for lighting retrofits. Increasing PoE capability, combined with the ever-decreasing power requirements of LED luminaires, have made it viable to install and power professional lighting with only an Ethernet Cat 5 or better data cable, eliminating the need for electrical rewiring. This alone can bring the costs of a retrofit within budgetary limits.

Wireless and software-based lighting controls can also contribute significantly to the simplicity and low cost of a LED luminaire retrofits. Innovative communications capabilities, such as visible light communications (VLC), which uses the LED light beam itself to transmit location data that is readable by a smartphone camera, lay the groundwork for indoor location services with exactly zero additional investment in hardware and system management.

Of course, if LED luminaires have the ability to share data as well as receive it, connected capabilities ride along with the luminaires “for free.” Modular designs allow organizations to “snap in” sensors and other connected devices over time, ensuring the viability of the system as business objectives grow and change over time, while delivering all the illumination benefits of LED lighting right out of the gate.

Cloud-based lighting monitoring and management allow full-service lighting companies, such as Philips Lighting, to offer lighting via innovative business models, such as Lighting-as-a-Service (Laas). LaaS service contracts typically differ from opportunity to opportunity, but the underlying instrument is typically a service-level agreement (SLA), in which the company pays for the light it uses, while the luminaire provider pays for installation and retains ownership of the lighting. The luminaire manufacturer uses its remote monitoring and maintenance solutions to hit performance targets spelled out in the SLA.

LaaS can knock down the barriers for entry for many organizations, eliminating upfront capital expenses entirely. Managed LED lighting is so inexpensive to operate relative to conventional lighting systems, which organizations can often use the savings to pay for the service contract. If the luminaire provider offers fixture re-use and reverse logistics at the system’s end-of-life, a company can enhance its green stewardship by participating in the circular economy. Schiphol Airport, in Amsterdam, the Netherlands, did just this in 2016 with new connected lighting systems in its terminal buildings. **[10]**

## **Data that supports ethics and governance**

Another benefit of connected lighting that may not be quite as obvious as energy savings and operations efficiency is support for ethics and governance, the third leg of the ESG model.

More and more frequently, organizations are being called on to demonstrate trust and business integrity to confirm long-term financial health. Data collected via connected lighting systems and the other smart services that these systems enable and host offers unprecedented transparency and insight into operations, supporting management accountability and proactive risk management.

## **Footnotes**

1. See, for example, “ESG Incorporation” at the US SIF website: <http://www.ussif.org/esg>
2. “Energy Use in Commercial Buildings.” U.S. Energy Information Administration: [http://www.eia.gov/energyexplained/index.cfm/data/index.cfm?page=us\\_energy\\_commercial](http://www.eia.gov/energyexplained/index.cfm/data/index.cfm?page=us_energy_commercial)
3. “Top 8 Things You Didn’t Know About LEDs.” U.S. Department of Energy: <http://energy.gov/articles/top-8-things-you-didn-t-know-about-leds>
4. “LED Lighting Forecast.” U.S. Office of Energy Efficiency & Renewable Energy: <http://www.energy.gov/eere/ssl/led-lighting-forecast>
5. Leber, Jessica. “General Electric Pitches an Industrial Internet,” *MIT Technology Review*, 29 November 2012: <http://www.technologyreview.com/s/507831/general-electric-pitches-an-industrial-internet/>
6. See, for example, MacDonald, James. “Space Utilization Metrics: The Who, What, Where and How.” iOffice

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7. See, for example, Dimick, Patricia. "How to Change and Optimize the Workspace with a Smart Office." Datafloq website, 30 April 2016: <http://datafloq.com/read/how-change-optimize-workspace-smart-office/2033>
  8. Remarks made by Akshay Thakur at the Philips Lighting speaker program, Light+Building, Frankfurt, Germany, 17 March 2016: <http://www.youtube.com/watch?v=nSfaflGwDqw&feature=youtu.be&t=1s>
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  10. "Philips provides Light as a Service to Schiphol Airport." Philips website, 16 April 2015: <http://www.philips.com/a-w/about/news/archive/standard/news/press/2015/20150416-Philips-provides-Light-as-a-Service-to-Schiphol-Airport.html>

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# Design features and analytics for greener buildings

[network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/design-features-and-analytics-for-greener-buildings](https://network.aia.org/practicemanagement/blogs/seth-anderson/2017/04/03/design-features-and-analytics-for-greener-buildings)

By Zack Moore

Green—or sustainable—buildings are drawing more attention today, as there is a growing interest in energy efficiency. Architectural design should contribute to the energy savings and sustainability of all future projects. This provides unique challenges whether the building is completely new, or if the architect is called in to renovate an existing, older building. Taking a look at different analytics and certifications, architects can begin to design with the future energy usage of buildings in mind.



## Energy Benchmarking

Energy benchmarking should be a focus for architects wanting to create greener buildings and secure additional certifications. Energy benchmarking is the process of tracking a building's annual energy use, and using a standard metric to compare the building's current performance against its past performance and the performance of its peers nationwide. Architects designing new buildings can use these analytics to incorporate proven energy saving designs over the long-term.

There are currently [over sixteen locations](#) in the United States—ranging from states to counties—that require energy benchmarking and the number of jurisdictions adding regulations continues to grow. Failure to comply with these requirements can lead to penalties and fines. Additionally, this benchmarking will be the key to making sure that the building becomes and stays certified in the future.

Once the data required for energy benchmarking is gathered, it must be entered into a federal database. The U.S. Environmental Protection Agency (EPA) uses this data to calculate the building's ENERGY STAR score. This score, given as a number from 1 – 100, provides an immediate understanding of how well a building is performing. To be eligible to achieve [ENERGY STAR certification](#) a building must score at least a 75.

Architects re-designing a building will want to look at the past performance of the building. This knowledge will aid the architect in providing the most efficient and effective methods for creating a greener, more sustainable building. By looking at ways to decrease energy leaks and inefficiencies, architects can make an incredible difference in how a building performs.

For example, Capitol Hill Tower Housing Co-op earned the EPA's ENERGY STAR Certification for 2016 by making renovations that were guided by sustainability practices and the consistent use of energy management software, like SOL VISTA's [Skywalk](#) platform. The EPA awards this certification when buildings “consume 35% less energy and contribute 35% fewer greenhouse gas emissions” than similar buildings across the nation.

## Designing for Energy Savings

For architects designing new buildings or major renovations, the Leadership in Energy and Environmental Design

Green Building Rating System (LEED) developed by the United States Green Building Council ([USGBC](#)) is the leading green building certification system. The USGBC knows that sustainability requires the incorporation of several factors and uses LEED to rate buildings on how well they manage in multiple areas. The six major areas are:

1. Sustainable Sites
2. Water Efficiency
3. Energy and Atmosphere
4. Materials and Resources
5. Indoor Environmental Quality
6. Innovation in Design Process

However, LEED alone does not guarantee you will drive ongoing utility savings at your clients' buildings. Engaging energy engineers early in the process and relying on energy monitoring platforms, such as [Skywalk](#), will help your design and make sure your building is performing as expected once in operation.

Here are some other quick tips to maximize the ROI on your efficiency efforts for your clients:

- **Incentives and grants** – When building or renovating, there are substantial incentives and grants available in different locations to help offset, or sometimes pay, the cost of the improvements. Architects can use the Database of State Incentives for Renewables and Efficiency ([DSIRE database](#)) to explore available incentives. We also help our clients navigate these incentive programs to make sure there isn't money left behind.
- **Building materials** – the earlier sustainable energy features are included in the design process, the lower the overall cost. When possible, choosing to include material such as [photovoltaics](#), as at the Genzyme Corporation's office building in Cambridge, helps green buildings generate their own energy and see 28% more energy efficiency than conventional buildings.
- Include in the plan **wireless, networked thermostats** to help reduce energy consumption. This modification helped the Hotel Mondrian-Los Angeles [reduce electricity usage](#) by 17%, while still maintaining the desired ambience and environment of the established hotel.
- **Water conservation**, especially in drought prone areas of the country, is crucial. Installing new lavatory and irrigation technologies can reduce costs by \$0.51 per square foot over 20 years. After identifying water usage issues, SOL VISTA helped implement a comprehensive overhaul of operational equipment, leading [Hotel Monaco DC](#) to reduce water usage by 48% and utility costs by 43%.
- **Tap into the Experts** - The decision to utilize energy consultants during a project can have long-lasting impacts to ensure that building stakeholders continue to see the benefits long after the design is complete. SOL VISTA's work with [The Westin Gaslamp Quarter](#) in San Diego, CA ultimately saved \$39,000 per year after Skywalk discovered that the HVAC system was not properly commissioned by a contractor.

Whether designing new buildings or redesigning existing buildings, architects can contribute to future energy savings and certifications for a client. A [study](#) estimated a "savings of \$1.16 per square foot annually, for a 20-year present value of \$14.77 per square foot based on a 5% discount rate." This return of investment is well worth taking the time to understand a building's energy needs and consumption plans to decrease energy usage across the board. Architects can use benchmarking analytics and energy consultants to inform their design to ensure greener buildings over the long-term.

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