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FORECASTING TRENDS FOR 2020

BY MARY KATE MCGOWAN, ASSOCIATE EDITOR, NEWS

Industry players are fine-tuning solutions to help the green building community address environmental challenges and customer demands. From human-centric lighting to securing the building internet of things (IoT), industry players discuss what they are expecting from 2020.

Lighting

The worlds of lighting and daylighting design will continue to converge, creating opportunities for more collaboration

For some time, lighting designers have primarily focused on electric lighting. Daylighting has typically been part of the architect's scope of work. In addition, the techniques and tools to calculate and plan daylight are much different than those used for electric light.

But as more lighting designers gain interest in daylighting—and as more clients desire it as part of their overall lighting scheme—the once-separate scopes of electric lighting and daylight will begin to converge. With

LEED points available for daylight, WELL points available for daylight and views, and new fixture technology to mimic the color, intensity, and movement of the sun, we'll see a need for more collaboration between architects, lighting designers, electrical engineers and daylighting consultants to create more holistic, balanced lighting designs.

Brent Protzman, building science & standards development for Lutron Electronics

Human-centric lighting philosophies will continue to grow in importance

Along those lines, more developers and design professionals are incorporating human

centric solutions into their projects, whether it's adding biophilic materials to workspaces, thinking about automated technology in classrooms, or using connected equipment in hospitality environments. All of these solutions are focused on the occupant of a space—and, once exposed to such technology, those occupants expect such amenities away from the home.

A human-centric lighting philosophy has both economic value—in the workplace, the workers themselves are a company's most valuable asset, worth more than energy or space efficiencies—and emotional value, as it helps in satisfaction and happiness. In a competitive



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commercial environment, it will pay to embrace it.

Brent Protzman, building science & standards development for Lutron Electronics

Full-spectrum lighting and tunable white will make more inroads

Tunable white is a big topic of conversation, but it has not yet become a mainstream technology. Still, many manufacturers in the industry are paying close attention to the tremendous amount of ongoing, academic research into the power of tunable white lighting and its potential impact on human centric lighting.

One manufacturer has natural lighting systems that are already delivering the next generation of beautiful, customizable illumination, full spectrum, saturated color, and advanced control integration that will be easy to deploy, even in retrofit situations. Another tunable white lighting series offers innovative technology for a wide range of projects. Developments such as these mean lighting will be even more integral to the overall comfort of the space.

Craig Casey, senior building science engineer for Lutron Electronics

Occupants want to network lighting technology with other systems without a hub

Occupants want control over their spaces. In residential spaces, people have hubs for heating and a hub for their appliances and a hub for their lighting. And all these hubs connect. It's really a numbers game. Some lighting companies' systems can natively connect its lighting products with other systems and phones to eliminate the need for another hub. The expectation of the end-user is that it should be easy to connect. You see a lot of residential spaces that are more advanced in terms of tech than other spaces, and for those spaces to compete with other building spaces, they need to change.

Monica Weglicki-Sanchez, senior manager of communications engagement for Acuity Brands Lighting

Controls, Software

Improving building automation system security

Security of the building automation system was one of the hot topics in 2019 and will be even more so in

Natural lighting systems blend indoor and outdoor light. Full-spectrum and human-centric lighting are anticipated trends in 2020.

2020. Even five years ago, security of a building was thought of as protecting the physical building and limiting access, but now cyberattacks are seen as the new vulnerability. In many cases the purpose of these cyberattacks is to use the computers or system as an attack mechanism inside or outside of the building. Whether the attack is directed at the building or just using the infrastructure the result is the same, a compromised building automation system. SSPC 135 (BACnet) has been working on an interoperable solution to this issue for over five years. The result is BACnet Secure Connect (BACnet/SC),* which is very close to being published.

Michael Osborne, P.Eng., Member ASHRAE, chair of ASHRAE Standing Standard Project Committee (SSPC) 135, BACnet, and firmware manager for Reliable Controls Corporation

*BACnet Secure Connect provides the means to create secure communications connections between BA devices both across the cloud, and within facilities, according to the ASHRAE SSPC 135 IT Working Group.

Increasing buildings' energy efficiency with BIM

Buildings consume a massive amount of the world's energy and resources. 2020 will see even more buildings retrofitted to be more efficient and more high efficiency new builds. To properly analyze the performance of these buildings, data is needed from many sources such as building information modeling (BIM), weather, historical, real-time and others. Today, much of this data is

not semantically tagged in a way that makes it practical to do the needed analytics. In 2020, this will start to change.

Michael Osborne, P.Eng., Member ASHRAE, chair of ASHRAE Standing Standard Project Committee 135, BACnet, and firmware manager for Reliable Controls Corporation

Securing the back-end of the building Internet of Things with BACnet Secure Connect

BACnet SC is out for final review, and the industry is excitedly waiting

for it to be published. Cyberattacks are on an uptrend, and buildings are a target because they may have computers, people and intellectual property. The impetus to get a secure IoT platform in BACnet is driving the adoption of the standard. Manufacturers are aggressively producing BACnet/SC products ahead of the standard's release, which almost never happens.

Michael Wilson, product marketing and sales operations manager for Automated Logic

Building Construction Materials

Integrating renewable energy systems into building design

Integrating solar photovoltaic into building design can be done anywhere you think glass could be. Building integrated PV can be installed like normal glass. For logistics, it does tend to perform better on the south, east and west sides of the building. The integration and engineering side of the integration process is configuring the wiring, which usually is not a problem if planned early in the design and construction process.

Replacing a traditional building material for PV can be more environmentally friendly and help decrease a building's carbon footprint. PV glass initially has a low carbon footprint, which becomes negative over time.

Anthony Pereira, altPOWER president & CEO

The design community is demanding American-made structural steel.

One of things we're seeing is the need for structural steel to be produced in America. If you're talking about steel to make a building, we've got the domestic capacity that we need here in the U.S. that's more

than enough even for the demand as it increases over the next 20 years.

We are starting to see the design industry specifying domestically produced structural steel or some other criteria that helps reduce the carbon footprint. For instance, all the structural steel that's produced in the U.S. comes from recycled steel. It's about 93% recyclable on average when it comes out of the mill. The fact this is available on a locally sourced basis is another big thing.

Tim Bradshaw, P.E., director of market development for the American Institute of Steel Construction

Customer interest is growing for authentic, single-origin building materials

The hunger for new applications for wood in commercial construction is a driving force, which includes a push for more wood in structural applications including structural round timber. Customers want to know the storyline behind their material and know where the material is coming from. They can trace the origin of the tree like they can trace a cup of coffee. Using structural round wood brings the look and feel of a healthy building material in your building, and it incentivizes healthy forestry, which can be a climate solution.

BIM is playing a role in facilitating specification of new products. Software can embed specification data such as single-origin storyline data, carbon sequestering data and environmental product declarations. If you know where your building material is from, you can track its carbon footprint.

Amelia Baxter, CEO of WholeTrees Structures

Reducing concrete's carbon footprint

It's all about embodied carbon. I think you will see a lot of trends coming up in policy and design about carbon. There was a report last year saying that if we get good at reducing operational emissions, and we switched to renewable energy then all the emissions from a building will be the materials involved in it. So, there's becoming more attention on this.

It's mostly because everyone has kind of figured out how to reduce energy in heating, lighting and cooling, but they haven't figured out this question (reducing carbon levels in building materials).

There's a report out there saying if you want to get to zero carbon footprint for concrete, to get there 50% of those reductions would have to come from some form of using CO₂ in the product itself. So, the one thing that's interesting about concrete is it

Using artificial intelligence in smart buildings

The most significant trend we have seen is in smart buildings and artificial intelligence. This technology helps us understand how the building is behaving through reading a significant number of data points for the building’s water use, lighting load and HVAC energy use. This helps us better predict building performance ahead of maintenance issues or with changes in the building’s energy,

electrical and gas demand. This is one of the most significant areas that we see that will change at an exponential rate over the next few years.

A significant area within this is utilities and end-users using automated demand response to control on-peak of electricity demand by shutting equipment down or modulating equipment down to control peak energy usage. That’s not something that’s easily achieved today, but through smart buildings and through

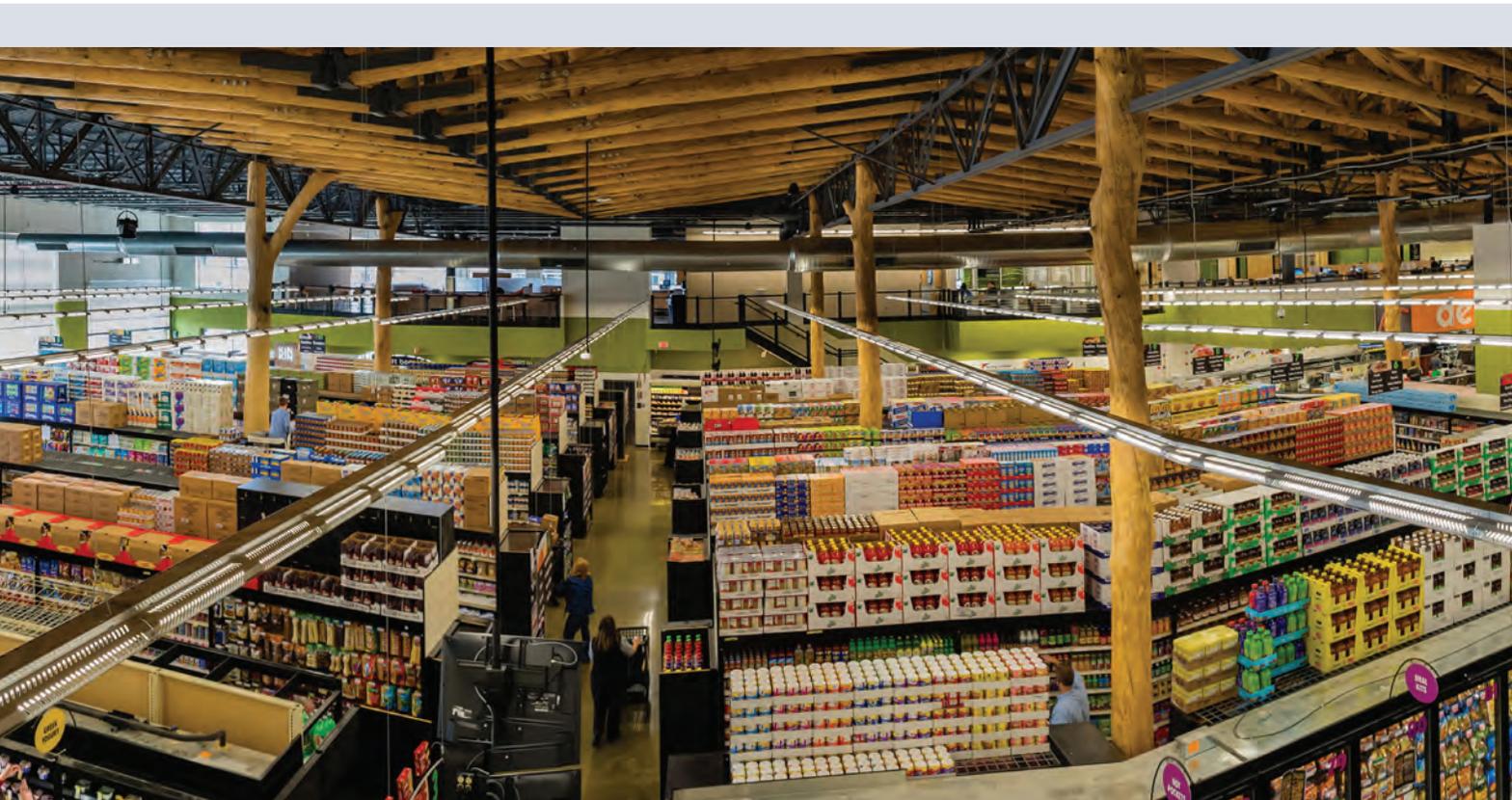
the Internet of Things (IoT), I believe will this be more commonplace in years to come, especially in states with high energy costs.

Kirk Thorne, Daikin Applied executive vice president of sales and marketing

Windows

Bringing the outdoors inside and vice versa

The biggest trend is indoor/outdoor living. Whether that be from patio and sliding doors up to large doors,



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can absorb a lot of CO₂. There’s lots of ways you can store CO₂ inside of the concrete. As it ages, it can absorb CO₂ from the atmosphere. But it will take investment and innovation to get there.

Eric Dunford, director of sustainability for CarbonCure

Improving steel’s carbon footprint

The steel industry is continuously improving its manufacturing processes.

One of the biggest things that we are doing as an industry is that there’s a new initiative within the structural steel industry to reduce the time of the manufacture, design, fabrication and delivery of structural steel by 50% in the next five years. That’s a lofty goal and whether we get there or not, is yet to be determined. But we’re going to work toward that, both from a

Customers increasingly want to know the single-origin story line of some of the building construction materials, including structural round mass systems.

manufacturing standpoint and how we manufacture the steel, how the steel gets fabricated in our fabrication shops.

Tim Bradshaw, P.E., director of market development for the American Institute of Steel Construction



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people are looking to bring the outdoors inside and expand indoor living spaces to the outside. We are seeing living rooms seamlessly integrate a deck or patio space.

This is another way to let more light into a building, which contributes to a healthier building. It can also help buildings meet Passive House standards. Using large window combinations also maximizes daylight and can help buildings comply with sustainability challenges.

Aliki Vrohidis, public relations specialist for Andersen Corporation

Certifying fenestration in commercial buildings and increasing daylighting

One of the trends we’re seeing is that there’s greater attention and awareness for certified fenestration and commercial buildings. Building owners, design-build professionals, code officials and others are

becoming more aware of the need for windows that not just reduce utility bills but can also have a big impact on health and human behavior. There are a lot of studies that show that children in schools learn better and retain information better if they have access to natural light. People in hospitals (with natural light) tend to heal faster and require less pain medication.

This carries over into commercial buildings. Absenteeism tends to improve, and there are some studies that say people tend to be in a better mood just because of the positive affect daylight has.

Manufacturers are always re-engineering their products. There are different ways you can assemble panes of glass or certain coatings that you can put on the glass or these harmless gas fills that go in between the panes.

Tom Herron, senior director of development and partner engagement for the National Fenestration Rating Council

Seamlessly connecting indoor and outdoor spaces is a trend for the new year. Large window combinations help maximize daylighting.

Commercial buildings trending to operational windows

There are fixed windows and operational windows, and there’s a trend toward operational windows in commercial buildings. Infiltration is unwanted air coming into your building, and natural ventilation is when you choose to open the window because you enjoy the fresh air coming in.

(It’s important to make) buildings healthier because we spend about 90% of our time indoors. We spend so much time at work, so we try to really make it a healthy, productive environment. We see building owners and others involved with the development of buildings paying more attention.

Tom Herron, senior director of development and partner engagement for the National Fenestration Rating Council ●