Does that mean inclusion of the latest, greatest technologies or does it imply well thought-out lighting delivered in appropriate layers that meet the needs of a space? Both, says our expert.

Optimizing Control. As much as one-third of all energy used by a lighting system is wasted on unoccupied space, while still over-delivering lighting necessary to occupied spaces. Controlling a comfortable environment to maximize energy efficiency requires actively responding controls that tune the system to meet the needs of the space.
According to a study by New York’s Urban Green Council, more than one million New Yorkers were plunged into darkness after Superstorm Sandy, and thousands were without power for weeks. What would happen if an outage occurred during a winter cold spell?

As part of its Building Resiliency Task Force, New York’s Urban Green Council (UGC), a branch of the USGBC, worked with consultants Atelier Ten to study the question of how buildings would perform, long-term, in the event of a prolonged winter power outage. The study, entitled Baby it’s Cold Outside, found that during an extended winter blackout, the temperature inside a typical single-family house would be 35°F after three days. A typical high-rise apartment would drop to 45°F after three days, and then keep falling. A high-performing building that has better windows, fewer air leaks and more insulation would do much better. After three days without power, a high-performing single-family house would stay above 60°F. And a high-performing high-rise would stay well above 50°F for more than a week.

In a summer blackout, says the UGC study, temperatures in a typical all-glass apartment building would jump to almost 90°F, eventually rising to above 100°F. But a high-performing brick high-rise building would keep interior temperatures below 85°F for a week.

Within a building category, there are three important factors that influence temperature during blackouts: the type and amount of window area, the amount of air that escapes through cracks and leaks in the walls, and the amount of insulation in the walls and roof. According to UGC, all three factors can be improved during the design and construction of new buildings, and in the renovation of existing ones. Between two buildings that are otherwise equivalent, the one with more window area will be colder during a winter blackout. Even the extra sun through a well-lit south window will barely make up for the absence of insulation; windows will lower temperature faster than a wall would, notes the report. During a summer outage, glass causes the building to heat up more. “Daylighting and energy benefits are minimal if windows take up more than 60% of wall area,” says the report. Using triple-paned windows, says UGC, can lower winter heat loss, although glass will never hold heat as well as insulated walls. In summer, says the report, any building...
**Outdoor Temp.**

- **All Glass High Rise**
- **Brick Low Rise**
- **Brick High Rise**

**DATAPOINT**

### Indoor Temperatures During a Winter Blackout

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**BLACKOUT CONDITIONS**

At the end of the week, there would be an 18°F to 27°F difference between a typical existing building and a high-performing building of the same type. All the high-performing buildings would maintain temperatures above 54°F.

**ENERGYSHIELD PRO**

Continuous insulation (CI) for exterior walls is becoming the specified norm in most North American climate zones. EnergyShield PRO is a Class A fire rated closed cell polyiso foam core laminated between Class A durable aluminum facers.

Atlas Roofing  
www.atlasroofing.com  
CIRCLE 303

After a week during a winter blackout, a typical building’s indoor temperatures would fall drastically, decreasing to a range between 32°F and 43°F.

These improvements also can be made to existing buildings, but resiliency calls for high-performing buildings that go beyond the current code. These buildings would use advanced practices and materials that are being deployed in the best buildings today. These practices are described in detail in UGC’s “90 by 50” report.

**The Die Is Cast**

Winner of the Precast/Prestressed Concrete Institute’s best multifamily housing award, the ÉTS École de Technologie Superieure dormitory in Montréal, is a great example of an envelope that balances window-to-wall ratio. The highly efficient and durable precast cladding system provides a more robust envelope against the elements, while still allowing in natural light and views. The envelope is actually a hybrid precast system from Slenderwall that is pre-insulated and cast with a light-gauge steel frame, which allows immediate framing of interior walls. The windows and insulation also were pre-fabbed in the panels so they would arrive ready to install into the 81,000-sq.-ft. building.
CITIES NEED MORE HIGH-PERFORMING BUILDINGS THAT CAN PROTECT AGAINST SEVERE OUTDOOR TEMPERATURES FOR A WEEK OR MORE DURING A BLACKOUT.

Cities, says UGC, need more high-performing buildings that can protect against severe outdoor temperatures for a week or more during a blackout. Today's buildings are different, notes the report, and the risk of a power outage causing a widespread, immediate loss of heating or cooling city-wide is very real. Not all buildings hold their temperature equally well without power. High-performing envelopes provide the best protection against severe weather and would maintain habitable temperatures for an entire week. “Superstorm Sandy taught us that the risk of an extended power outage is real. We can start now by building new high-performing buildings and renovating the ones we have. Everyone deserves the protection of a resilient building,” concludes UGC.

SOPHISTICATED NATURAL VENTILATION

An aluminum window system is used for constructing parallel-opening or projected top-hung windows with two types of thermal insulation and glazing. As façade windows with standard insulating glass and a continuous glazing bead, these units can be integrated without affecting the uniform façade geometry.

Insulating Glass Units

The Algonquin Centre for Construction Excellence in Ottawa, Ontario, Canada, was awarded a 2013 Canadian Green Building Award in part due to PPG glass integrated into high-performance building envelope. Solarban 60 glass was fabricated into triple-glazed insulating glass units (IGUs) that measure up to one full story in height and flood the school with daylight while providing R-8 insulating performance.

The IGUs are part of an integrated system that automatically controls lighting, daylighting and sunshades to balance illumination and solar heat gain. Together, the building envelope and related features enable the school to operate with 65% less energy than those built according to Canada’s Model National Energy Code for Buildings.

When paired with clear glass in a standard, 1-in. double-glazed IGU, Solarban 60 glass has visible light transmittance of 70%, a solar heat gain coefficient of 0.38 and a light-to-solar gain ratio of 1.85.
Edith Green-Wendell Wyatt Federal Building

Originally built in 1974 with tinted, single-pane glazing, the 18-story Edith Green-Wendell Wyatt Federal Building in Portland, Ore., has been renovated, in part, using Viracon’s insulating laminated glass. Architects SERA/Cutter Anderson stripped the obsolete facade to structural steel and installed a high-performance curtainwall consisting of Viracon’s Insulating Laminated VE2-2M glazing. A significantly better performing envelope was critical as it was part and parcel of a new HVAC scheme that shifted from VAV to more passive hydronic heating and cooling. That change impacted the envelope in that each floor now has higher floor-to-ceiling ratios to let in more daylight. In turn, solar heat gain mitigation had to be considered. The glazing is supplemented by a system of reed-like aluminum rods on the east, west and south facades. The renovation is expected to perform 55% to 60% better than a typical high rise.

High Performance Glass at MLK High

TMP Architecture designed Martin Luther King Jr. Senior High School in Detroit with an emphasis on safety, sustainability and energy efficiency. The 245,412-sq.-ft. school has six wings, and includes a glass-enclosed atrium of more than 1,000 sq. ft. of laminated glass panels. The building also incorporates ballistic-mitigating glass throughout the school’s first story, and features high-performance, energy-efficient glass throughout, which contributed to the building’s LEED Gold rating. Guardian SunGuard SuperNeutral 62 and SuperNeutral 68 low-E glazings optimize daylighting while managing solar heat gain.

Mosaic Village

Johnson C. Smith University of Charlotte recently chose Kingspan’s Benchmark DW2000V insulated metal panels (IMPs) and Morin 29 7/8 single panels. The IMP was a 24-in. module and the lengths varied depending on what area they were installed. They were also used for the soffits to give total encapsulation of each bumped out area of the structure. The panels had a 0.5-in. reveal. “Using Kingspan IMPs to construct Mosaic Village allowed smooth one-piece seamless corners for clean, crisp building details at the corners. The IMPs offer the flexibility of being able to blend easily with other finishes,” said Mike Dunlap, contractor, Preformed Metal Panels.
**Admiral by the Lake**

Utilizing Kawneer's Trifab VersaGlaze 451T framing system, Perkins+Will's Dallas office was able to set a new standard in senior living with the Admiral at the Lake high rise in Chicago. The window system on the 628,570-sq.-ft. complex provided enhanced thermal performance and a range of design options that fit the project's requirements, including the ability to match the performance of the post-tensioned concrete structure, which is clad in masonry and stonework.

**SIPs Aid in Wellness Center LEED Goal**

The Little Big Horn College Health & Wellness Center, Crow Agency, Mont., used SIPs for its interior walls and roof. "Energy savings is a big part of getting to the LEED Platinum goal," said Ben Mitchell, project manager with Fisher Construction, general contractor. "It's hard to get a gym to meet any energy code, let alone LEED Platinum, but the SIPs provide a super energy-efficient envelope—much better than we could get from other products for the same labor and material costs." Image: Premiere SIPs.