Guest Columns

How can tracking data improve the well being of humans and our planet?

Lisa Bate
principal
B+H Architects

High performance building design has always been fundamental to the **B+H** process, and since the mid-1990s, we have been committed to creating innovative sustainable designs for current and future developments across the globe. Minimizing resources and consumptives and their effects is fundamental to our process and an important factor for us and all of our clients. With new technology available, it is now possible to track and quantify building performance data in real time, which can be used to improve the performance and well-being of humans and our planet.

The next wave of sustainable building innovation—the accumulation, interpretation, and sharing of live data—is what will contribute the most value to humans and to companies going forward.

GIGAdata

One of the most useful tools for sustainability-focused designers, architects, and builders is **GIGA**, a database system and app that comprehensively tracks building and material performance in real time. GIGA helps green building professionals find the best manufacturers and products that contribute to a sustainable design.

Created by a team of ex-pat, local architects and designers in China, GIGA was originally conceived to improve green building standards. Since receiving international recognition from the **Clinton Foundation**, it has evolved to incorporate data from several other countries as well. The resulting data provides design professionals, building owners and property managers a snapshot of what's being done in several regions and how interior designers and architects are tackling green standards.

Monitoring Performance

Beyond the literal nuts-and-bolts, monitoring the environmental health of building occupants is another stream of data that demonstrates the value of green standards. GIGA allows owners, tenants, and building professionals to monitor air quality and environmental conditions, such as ambient temperature, CO2, PM2.5 (pollutant particulates), and relative humidity using the RESET app.

Typically, industry standards analyze indoor quality in the "flush-out" phase that follows the completion of construction—preceding occupancy—and is not monitored as closely once occupancy begins. But with the database, professionals can predict the off-gassing period through material specifications and architectural data, potentially saving building owners and tenants time and money on move-in dates. Then once operational, through monitors and the app-tracking real time data, we can adjust building systems, such as fresh air intake and volume of air flow, to provide a healthier more productive environment. Monitoring data tells us when to replace equipment filters and change cleaning, printing, and other products to provide the best indoor environment for people to work, learn, live, and play in.

"Like any other resource, data like this remains useless if the industry does not learn from it, innovate from it, or choose to act on it."

One could argue that the value of a building is only fully realized once it is inhabited, as the occupants are where the big money is and big data needs to be focused. But you can simply look at the RESET app and see the impact of cleaning products high in VOCs being used or the impact when cigarette smoke enters a monitored area through an open door. This app helps professionals to see the impact of buildings as they age and to anticipate how other environmental concerns can develop over time.

Data as a Tool

Although the wealth of data provided by GIGA is an important tool, it's just a tool. Like any other resource, data like this remains useless if the industry does not learn from it, innovate from it, or choose to act on it. While the industry has expanded and grown significantly, it is also constantly evolving to accommodate changes in the economy and the environment. We at B+H are looking forward to further developments of the app to monitor acoustic performance, lighting levels, and energy to drive human comfort and social sustainability as we recognize the inhabitants of our designed buildings are our clients' most valuable asset.

Lisa Bate is B+H Architects' regional managing principal of North America. As an ambassador for sustainable design, Lisa has held various positions on environmental boards including **Canada Green Building Council** and the **United Nations Environmental Protection-Sustainable Buildings and Climate Initiative**. Lisa also currently sits on the Board of Directors for the **World Green Building Council**.

PHOTO: ANDREW WILLIAMSON

"Resiliency is the ability to go beyond energy security to achieve comfort, quality of life, and affordable livability, and passive buildings are making this a reality."

Why is it imperative that we bring the conversation of resiliency, especially in affordable housing, to scale? To enable a future that provides for the safety, health, and viability of all.

Katrin Klingenberg
executive director
Passive House Institue US | PHIUS

High-performance building and zero-energy certification standards are widening the conversation beyond simple energy consumption and greenhouse gas emissions reductions to put a greater emphasis on human comfort, health, and resilience.

Severe weather events like Hurricane Sandy reminded us that assuring safety and survival are the main priorities in the face of a disastrous event, yet if our communities are to be truly resilient, they must also be able to coast through power outages in addition to being socially and economically resilient. Building better buildings is an important component of developing more resilient communities.

This conviction was a driving factor behind the development of the **PHIUS+2015 Passive Building Standard** released by **Passive House Institute US (PHIUS)** this past year. This standard is the first of its kind that is based upon climate-specific comfort and performance criteria. It pins down the sweet spot between investment and payback to present an affordable solution to achieving the most comfortable and cost-effective building possible for a given location. Buildings designed and built to this standard perform 60-85% better (depending on climate zone) on an energy consumption basis when compared with traditional construction.

Yet the benefits of passive buildings go way beyond mere energy savings, because energy efficiency at this scale means that with the addition of a small renewable energy system, occupants can not only zero out their home's greenhouse gas emissions and reduce their carbon footprint under normal operation, but they can also survive off the grid in the event of natural disaster or other crisis. If all buildings were built to passive building standards, then a small micro-grid would suffice to power an entire community and make it less vulnerable to power outages. Resiliency is the ability to go beyond energy security to achieve comfort, quality of life, and affordable livability, and passive buildings are making this a reality.

The release of the cost-optimized PHIUS+2015 Standard is spurring new growth in passive buildings from coast to coast. Certified and pre-certified PHIUS projects have now surpassed the 1-million-square-foot milestone, consisting of 1,200 total units nationwide, with some of the most notable gains coming from the affordable multifamily housing sector. More units coming online means more families are enjoying the benefits of passive buildings, and that we are that many more steps closer to a more resilient future.

The affordable housing sector is taking notice of the demand for these projects. **The Enterprise Foundation** now actively incentivizes PHIUS+2015 certification under their **2015 Green Communities Criteria**, used by affordable housing agencies in 22 states across the country, with various other housing finance agencies and major cities like New York City, San Francisco, and Seattle directly encouraging developers to take the extra step of PHIUS+2015 certification.

Following the recent completion of phase two of the **Orchards at Orenco** affordable multifamily housing development in suburban Portland, Oregon, built to meet the PHIUS+2015 Standard, prospective tenants lined up around the block before dawn for the chance to call home to one of the largest passive building projects in North America.

It is imperative that we bring the conversation of resiliency, especially in affordable housing, to scale. With so much activity going on in the affordable housing sector right now, this is a great opportunity to address many of the challenges that lie ahead in the coming years beyond the implications of climate change. Shoring up the resiliency of our buildings and communities will be an integral step to building a future that provides for the safety, health, and viability of all; and that is something we here at PHIUS believe everybody can get behind.

Katrin Klingenberg is the Executive Director of **Passive House Institute US (PHIUS)**, which she co-founded in 2003. A German-born and trained architect, she drove the development of the new climate-specific, cost-optimized **PHIUS+2015 Passive Building Standard** and now directs the technical and research programs of PHIUS.

PHOTO: KATRINA KRAMENA VIA PHIUS

"Moving the frontlines of the fight for better buildings from individual projects to entire portfolios held by real estate companies and funds will accelerate and deepen the impact of the green building movement."

What do the benefits and value provided by green buildings look like at scale?

Dr. Chris Pyke
chief operating officer
Global Real Estate Sustainability Benchmark

Every high performance green building is a great idea. Each project saves energy, conserves water, manages waste, promotes occupant comfort, and provides many other benefits for people and the environment. The green building movement has created thousands of such better buildings, and the value of these properties has been repeatedly recognized with superior economic performance—lower vacancy rates, faster to lease, higher effective rents, and increased operating income.

This track record of success has now changed the question that businesses are asking related to green high performance buildings, and more recently, the burgeoning market for ultra-efficient net zero energy buildings: What do the benefits and value provided by these buildings look like at scale? We know that we can create one great project and that great projects represent buildings that are better for people and the environment. The challenge before us is to take this experience and create value by embracing and integrating these ideas as core business strategies. This means moving the frontlines of the fight for better buildings from individual projects—the site of so many tactical victories—to entire portfolios held by real estate companies and funds. This change in focus will accelerate and deepen the impact of the green building movement, taking us from a few marquee projects to ubiquitous market transformation.

What does it look like when high performance building is integrated with business strategy? Let's take a look at the case of a global leader recognized in the annual **GRESB** assessment. GRESB is a platform to assess, score, and benchmark the sustainability performance of property companies and funds around the world. In 2015, GRESB covered a broad cross-section of the investor-owned real estate universe, including 707 companies and funds with an aggregate asset value of $2.3 trillion. The assessment is the global benchmark for environmental, social, and governance (ESG) performance of real estate companies and funds. GRESB is not a certification; rather, GRESB's ESG data provides actionable transparency for investors.

Want to learn more? Meet Chris Pyke at the **New Buildings Institute *Getting to Zero* Summit** in Denver, Colorado on **October 12-14, 2016** where he'll talk more about how industry leaders are turning project experience into integrated business strategy.

In the case of **LendLease**, a perennial sector-leading property developer and operator, the company engaged a decade ago in demonstration projects to sketch out a practical roadmap to "zero net" performance, such as its early demonstration project providing "zero net" carbon, waste, and water performance for military housing at Ft. Campbell, Kentucky. Today, LendLease has institutionalized this experience in a commitment to address "strategic challenges" including climate change impacts and resource scarcity through strategies for energy, water, waste, and supply chain management. This is reflected in exceptional performance goals for projects such as **Bangaroo South** in Sydney, a 7.5-hectare urban regeneration site targeting carbon neutral operations. The key is in integration. Bangaroo South is not a one-off project. Instead, it reflects a long-term commitment to gaining practical experience and institutionalizing high performance building goals. Importantly, with this kind of track record, it would be unthinkable for the next project to set lower standards. This creates an internal ratchet that incrementally drives expectations toward higher performance and integrates sustainability more deeply into the organization's core value proposition.

LendLease's experience is not unique. GRESB recognizes a cadre of comparable sector-leaders around the world, such as Kilroy Realty, Host Hotels, and UBS Real Estate. These leaders set the industry standard and clearly demonstrate the potential for high performance, even a practical pathway to net zero. However, it is essential to recognize that these leaders are not the norm. Our wealth of project-level experience is not raising all boats equally. Results from the annual GRESB assessment show that the majority of participating companies and funds have room for improvement and many are just starting out. In the vast majority of cases, real estate companies and funds could be doing more to reap the benefits of project-level experience with organizational strategies that institutionalize approaches to creating value from superior projects. Project experience tells us how. Our business strategy will take these lessons to scale and create real business value.

Dr. Chris Pyke is the Chief Operating Officer for GRESB, an industry-driven organization committed to assessing the ESG performance of real assets around the world. He also directs the **Green Building Information Gateway** (www.gbig.org), a global platform providing information about green building activity and serves on the United Nation's Intergovernmental Panel on Climate Change.

PHOTO: COURTESY OF GRESB