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Green building has come a long way, but it’s time to zoom in on energy and indoor air quality. That’s where Passive House shows the way.

On average, new buildings last between 70 and 100 years. If they are not built with energy efficiency in mind, wasted energy from these buildings can burden the national economy for four to five generations. This becomes even more daunting when you take into account existing construction that does not incorporate sustainability and energy-efficiency.

Walking the Talk. Bayer MaterialScience built its EcoCommercial Building in Greater Noida, India, in collaboration with local companies. Constructed using high-tech materials from Bayer MaterialScience, the low-energy structure serves as a model for sustainable building design.

Now’s our chance to make wise building choices and improve building methods to increase energy efficiency and reduce waste and emissions. The opportunity for advancement is there if people are willing to take it. Thankfully, the prevalence of green buildings is growing.

Green building is not just a passing fad or buzzword: It’s here to stay. The concept is no longer limited to the rich or very eco-minded. As technology continues to evolve, sustainable, energy-efficient building has become more accessible than ever.

Over the years I’ve seen people adopt green building practices for a number of reasons, ranging from social to environmental to financial. Whatever the motivation, there are a variety of paths in place to achieve green, sustainable building.

LEED emerged as a structured program to address a broad spectrum of environmental issues as they relate to buildings. The majority of the categories specified by LEED have now become incorporated into the common practices of architects, designers and builders. The next frontier involves even more control of energy and atmosphere, two key strengths of Passive House construction.

Why Passive House?

Organizations such as the **Passive House Institute US** (PHIUS) strive to make high-performance passive building principles the mainstream best-building practice. To achieve a passive house certification, buildings must comply with standards adapted to meet U.S. economic reality and a rigorous building plan. Commercial and residential new builds as well as building retrofits are all eligible for this designation.

The passive house approach focuses on energy balancing as the basis for zero/positive energy in a building. Katrin Klingenberg, executive director of PHIUS, spoke recently at the **Passive House Western Pennsylvania** "Beyond the House" conference and identified several key elements for achieving this: a continuous insulated envelope; high-performance windows and doors; constant fresh air supply; well-managed internal loads; efficient heating and cooling devices; efficient hot water generation; and incorporation of solar and wind energy.

Many of the elements identified by Klingenberg support the overall green building trend of placing great importance on the building envelope. Optimizing the building envelope helps to maintain a comfortable indoor environment for building occupants, while protecting the building from outside elements and temperature changes. Improving the building envelope requires a shift in both the allocation of your budget and your mindset. More of your construction or renovation budget will be spent on the envelope with the tradeoff that less will be spent on the building's mechanical systems. Whereas this seems like a straightforward concept, it is opposite of conventional building budget allocation, which gives some people pause.

In my opinion – one that I have heard echoed by many in the industry – better education is needed to transform the mentality of architects and builders as well as home owners. Whether they are trying to achieve passive house certification or meet other standards, they need to **look beyond the upfront cost investment of an efficient building envelope to the long-term cost savings that will be realized through reduced operating costs.** Groups like PHIUS offer professional training and certification programs to educate builders, raters and consultants on the components and benefits of this approach.

I also see government officials and regulators playing an important role in helping to shift the mindset of people all along the building value chain. Changes in building codes will help spur greater awareness and adoption of more stringent building standards. There has been a 38-54 percent efficiency boost for homes and commercial buildings in the U.S. over the last three code cycles (nine years of codes) according to Bill Fay, executive director, **Energy Efficient Codes Coalition**. This speaks to the efficacy of implementing stricter codes. A draft proposal by the U.S. Environmental Protection Agency mandating a 30-percent reduction in power plant's CO_2 emissions by 2030 provides a glimpse of what may be to come for the building industry. Since America's buildings account for 39 percent of U.S. man-made CO_2 emissions, a similar bill could be in the building industry's future.

Working Together

In addition to the Passive House "Beyond the House" conference, these issues were also a topic of discussion at a recent EcoCommercial Building (ECB) collaborator workshop. The ECB Program is a

global initiative, driven by Bayer MaterialScience, to develop and promote solutions for sustainable construction, particularly in the building envelope, with an aim to reduce energy use and emissions, lower life cycle costs and increase user comfort. At the workshop, national and local Pittsburgh building industry leaders convened to discuss ways to achieve this, how far the industry's come, where it stands currently and future trends. This gathering highlights another trend I've noticed – collaboration.

Members of the building industry, manufacturers, community organizations and educational institutions, to name a few, are more frequently working together to advance the green building industry through innovation and hard work. They're joining forces to build new, sustainable buildings, retrofit existing structures and promote energy-efficient practices. Through my experiences with Bayer and its commitment to sustainable development, I've witnessed first-hand the transformations possible when you combine like-minded industry and community leaders focused on a shared goal. By educating builders and home owners and promoting achievable standards, the green building movement will continue its momentum – helping to reduce emissions, conserve energy and lower long-term operating costs. This is an exciting time for those of us who believe so strongly in sustainable building design and construction, as we witness its steady progress along the continuum from fad … to trend … to commonplace.

About the Author

Julia Rubino is director of Industrial Marketing for Polyurethanes in North American at Bayer MaterialScience LLC. Rubino joined Bayer in 1999 and assumed positions of increasing responsibility within sales and marketing. She holds a bachelor's degree in chemistry from Geneva College and a master's degree in macromolecular science and engineering from Case Western Reserve University.

- See more at: http://www.greenbuildermedia.com/blog/passive-house-is-a-natural-next-step#sthash.oUbuUpVh.dpuf