



Are all green buildings healthy buildings?

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Sustainable architecture is often pitched as having benefits beyond simply a pat on the back for being more environmentally responsible. In addition to the possibility of monetary savings over time for increased efficiency, the positive health aspect of greener buildings can be a valuable attribute, sometimes the most valuable. While some of us are less enticed by energy savings, talking about changing the building practices that are making us sick resonates with just about everyone.

The problem with the generation of hype and buzz words is that particulars tend to fade from popular discourse and lots of things start to mean the same thing in the eyes of those outside of the industry. Green / Environmental / Ecological / Sustainable / Healthy. These terms are undoubtedly related, but do they really mean the same thing for buildings? If you are building a greener building are you definitely getting a healthier one?

Sustainability is never a one-dimensional endeavour. Its very nature of balance amongst interconnected components implies there is no lone important variable. For humanity, there is no one-way to fix all of our environmental transgressions. With no shortage of areas to improve, there is a resulting multitude of possible solutions.

The same is true for our buildings. Things like the sourcing of recycled materials, building energy use, utilizing natural lighting, and maximizing water efficiency all join indoor air quality as methods for continuously improving the relationship between our buildings and the rest of the biosphere. Easy examples are the mitigation of stormwater and the creation of microclimates with green roofs or the incorporation of renewable energy with power storage. While all of these goals are important they are not always co-dependent, making it important to understand the distinction in order to ensure we are coming home to a cleaner lifestyle.

The health of our natural environment is significantly influenced by how our buildings



interface with natural resources, but as a culture we don't spend a lot of our time in natural settings. Most of us will spend an average of 90% of their time indoors.

As a consequence, our health in our homes and offices is largely determined by the materials we interface with everyday.

Targeting the environment inside

Things like asbestos, radon and lead piping have risen to a respectable saturation level in the pool of common knowledge, enough to either have most people proactively asking about them or contractors that proactively address potential issues, but there are numerous components that contribute to indoor air quality. One of the better-known options is choosing materials and finishes. Many common building materials are treated with chemicals that are used for durability. Lasting longer is great, but the trade-off can be that these components end up releasing chemicals into the air over time, a process known as "off-gassing". Things like particleboard and plywood are made with glues that can contain formaldehyde. Finishing products are another prime source of Volatile Organic Compounds (VOCs) that gradually release toxins into the air. Paints, varnishes and lacquers are the usual suspects, however most of them now have "Low" or "No" VOC counterparts.

But according to indoor environmental expert *Wayne Tusa*, this popular method often ends up eclipsing other equally important components of ensuring a healthy indoor environment. *"Using non-toxic materials is great, but there's more options that are often missed that are just as important."* I caught up with Wayne who is the President of Environmental Risk & Loss Control and has been assessing and mitigating problems of moisture and mold in New York City for over 20 years and he is quick to point out the potential differences between "green" and "healthy" buildings. He also noted that when it comes to material off-gassing most of it takes place within the first 1-to-5 years while other problems can last much longer if not addressed. I asked him what he often found to be the largely missed opportunities.

- *"The first is definitely great filtration, namely HEPA-Carbon filters."* Being able to clean the air that circulates through mechanical systems can have a substantial impact on quality. Things like allergens and mold can all be pulled out by high quality filters and removed from the cycle that most of our bodies mistake as normal "clean" air. In *Tusa's* mind, most generic filters out there are relatively useless. However, HEPA filters do have an impact on air flow, which means that systems need to be properly calibrated and engineered in order for them to work appropriately. Often, you need to know enough to ask for them.
- *Tusa's* second item was a tight exterior envelope. *"A large portion of indoor air pollutants come from the outside,"* penetrating through cracks between components of the exterior wall. Even things like carbon monoxide and allergens can find their way into a leaky facade and linger inside the home. Wayne said he had occurrences where apartments next to bus stops would experience heightened carbon monoxide levels due to air infiltration from



outside.

Really important, but not really common

The case for building improvements that promote healthy indoor environments is not exactly difficult to make, yet for many consumers or prospective tenants it does not rank up there with renewable energy and recycled materials, let alone square footage and views. One problem is most of these things are not all that glitzy. Education is still trailing enough so that most people will not know to ask if the furniture is built with formaldehyde-free material.

It can be hard to get people to pay for the quality in things that they can't see or otherwise look identical to the economy option that slowly poisons them. This is the place where building codes can help pick up the slack. A great deal of energy efficiency achievement in our buildings is due to regulation, not frugal users. The same forces that took lead paint and asbestos out of our interior spaces can do the same with a new generation of toxins.

In the end, while I would say that a building with a healthy indoor environment is most likely going to be a greener one, there are plenty of things that make a building more sustainable outside of the realm of improving personal health. Our efforts in making green buildings should be exhaustive to include a healthier product for the environment, but also a healthier environment for us.

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