



## Can Green Buildings Really Help Combat Climate Change?

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### **Introduction**

Smart cities are becoming increasingly important to combat the global climate change crisis. They are uniquely positioned to tackle numerous sustainability tactics, ranging from greener commercial buildings to electrifying public transit, using the Internet of Things (IoT) to connect and better understand the major contributors to carbon emissions. In urban areas, the impact on the environment is markedly different than in rural areas (Abdoullaev, 2011). People in urban environments consume much more food and goods than rural populations. They also own more cars per capita and use more energy. Increased energy consumption creates heat islands in some places that contribute to changing local temperatures and weather patterns. At a micro level, buildings in cities consume a huge portion of primary energy and electricity, which is significant because the process of making energy is one of the largest sources of greenhouse gas (GHG) emissions worldwide (Von Weizsacker *et. al.*, 2009). Despite these challenges, action is being taken at every level of society to combat climate change. One of these changes is taking place at the micro level inside the four walls of what are known as “green buildings.”

### **Green building**

A green building is a building that’s designed with the health and wellbeing of both its occupants and the environment in mind. Everything about a green building, like how it’s constructed, operated and maintained, aims to minimize its impact on the environment and provide a healthy work environment (Kibert,2016).

### **Features of green building**

- Reducing water and energy consumption
- Minimizing greenhouse gas emissions
- Using eco-friendly building materials
- Decreasing landfill waste
- Being located thoughtfully to shrink commute times
- Encouraging renewable transportation use
- Encouraging IoT connectivity
- Enhancing the natural environment with trees, green roofs or community gardens

Not only do green buildings reduce negative impacts on the environment, but they also save money on operating costs, especially over the long run. By enabling IoT technology,



building occupants who value the health and wellbeing of our planet have an opportunity to contribute to energy savings and reduce their carbon footprint (Kibert,2016).

### ***LEED (Leadership in Energy and Environmental Design)***

Green buildings can be certified using LEED, the most commonly used green building rating system in the world (Council, 2008). There are several different levels of LEED certification, depending on the credits a building achieves above and beyond the basic certification requirements. Regardless of the level it reaches, LEED-certified buildings are widely recognized as buildings that save energy, water and resources and generate less waste and support human health.

### **Green Buildings Help to Combat Climate Change**

Green buildings work to slow down the effects of climate change in two main ways. First, they are more energy-efficient. Energy efficiency can be accomplished by conducting retrofits, optimizing operations, IoT connectivity, adding solar or renewable energy onsite or taking advantage of existing landscape features like shade. In fact, by focusing on energy efficiency measures, new buildings can often reduce their energy consumption by up to 25 percent and old buildings by up to 16 percent (Darko *et al* 2017). Furthermore, by 2040, changes to space heating, water heating and water cooling could see buildings become nearly 40 percent more efficient than they are today.

Second, green buildings can help to promote green communities. Smart city agendas globally have placed a great deal of importance on sustainability and creating greener and healthier cities for their citizens. Green communities take into account the many facets of the built environment and try to lessen their impact on the environment together (Chan *et. al.*, 2017). This includes increasing access to cleaner transportation or walking / cycling, reducing water usage, enhancing green spaces and carefully planning cities and communities to minimize disruption to the environment. Green buildings, when situated inside green communities, can maximize their impact and contribute to an overall societal shift towards a healthier tomorrow.

### ***Conclusion***

Green buildings have become increasingly popular and important in the last several decades. As more occupants look for spaces that are good for both people and the environment, and as the pressures to slow and reverse climate change heats up, green buildings are here to stay. There are many opportunities to “green” both old and new buildings, especially with IoT technology becoming more mainstream. Sometimes these changes are major and involve deep retrofits. Other times, they require more actions to optimize workflows, people, processes and things. Regardless, greening a building benefits everyone: the occupants, the environment and the owner/operators’ bottom line.

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