

# RECLAIMING SUSTAINABILITY

By Chris Bjork

Photo courtesy of ArcaTea Architecture

In 2013, an alarming piece of released governmental data revealed how Colorado had become a central target in contributing to the threat of climate change.

Between the years of 2000 and 2010, the state was recorded having one of the largest decade increases in carbon emissions in the country, according to federal Energy Information Data. A big culprit was Colorado's residential sector, where emissions rose nearly 15 percent. This posed a grim outlook for the future and sustainability of continued home construction in the state. Buildings in the U.S. alone are responsible for more CO2 emissions per year than those of any other country except China, according to the United States Green Building Council. In combination with the country's commercial sector, they total for 39 percent of CO2 emissions in the nation annually, surpassing industry and transportation. This means that the green building market in Colorado remains a powerful and influential avenue for fighting global warm-

ing and promoting smart land use. In the current wake of anticipation for Trump's administration to reverse Obama's proposed Clean Power Plan, these measures in green building practices now play a vital role amidst an unpredictable political landscape.

There are several cities and counties in Colorado that have begun taking drastic strides in shaping the industry towards more environmentally sustainable architectural practices. However, there is arguably no other area playing more of a pivotal position in pioneering these efforts than in Boulder County. Historically, Boulder has had a longstanding reputation for its eco-friendly customs that are mirrored in a large portion of the county's businesses as well as its orientation in infrastructure. For example, the county has one of the most stringent building codes in the country. The city of Boulder became the first to establish green building standards known as "Green Points," for all new residential structures and renovations that were constructed larger than 500 square feet. Several builders became motivated to incorporate even stricter standards in their projects. This created a demand for the building of more energy efficient residential development and a harder drive to apply retrofitting within housing renovations.

Leadership in Energy Efficient Design (LEED) is one of many ways to quantify green building efforts and achievements. "Green buildings are defined as those that reduce energy consumption, conserve resources (like water, land or trees), and protect indoor and outdoor environmental quality (minimizing toxicity). The USGBC's popular LEED green building certification program defines green buildings in 5 key classifications. These categories include energy efficiency, water efficiency, resource efficiency, responsible site management and improved air quality. The City and County of Boulder uses an energy measurement called the Home Energy Rating System (HERS) as a mandatory aspect of the building code. Most recently, in May of this year, the City of Boulder adopted new, stricter standards, and dropped the Green Points system. The revised energy code outlined goals for reducing emissions in several areas. These included planned reductions in community and city organization carbon emissions, as well as an outline for 100 percent clean electricity by 2030. Boulder County's green housing market is at the heart of making these targets a reality. With no room for negotiation regarding compliance in the county under these new regulations, Boulder is demonstrating its progressive objectives on how to tackle climate change in a remarkable way.

The industry has its eyes on the horizon as certain projections estimate the population in Boulder Valley to reach around 118,000 people by 2020. Last year, around 100,000 people moved to the Front Range with approximately 1,000 of those making their way to Boulder. The gradual increase in occupancy within the progressively green residential and commercial sectors may create an influence for other districts to adopt these strategies in sustainable building. Founding principal of Rodwin Architecture, Scott Rodwin, AIA, is a pivotal player in the green architectural movement in Colorado and has been a leader in sustainable design for nearly

two decades. Rodwin is familiar with how Boulder's dynamic strides in the industry have potentially projected a direction other areas in Colorado may be headed.

"Boulder's green building codes are pointing to where many other municipalities will be heading in the very near future," Rodwin said.

As restrictions revise and redevelop for green building in the state, there are challenges that present themselves in various forms. Other topics of concern float to the surface, as the economic framing that rely upon these contemporary applications in

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## The value in reclaimed building

There are few eyesores tougher to ignore and more tragic to behold than that of the sprawling American landfill. The United States has over 3,000 active landfills. The methane emissions generated from these are 25 times more destructive as a greenhouse gas than carbon dioxide. Waste from construction projects account for more than 30 percent of all U.S. landfill waste. This puts residential and commercial demolition ruin as a primary contributor to global warming. For many years,

design are put to the test. Do modern technologies have the power to maintain structural coherence in existing buildings? What will this mean for historic structures that have a significant cultural value threaded within Colorado's heritage? Will awareness and demand for green homes and sustainable housing in the state be practical in the long run? Solutions and predictions vary with these tenets in mind for many industry leaders in Boulder County. The scope of what's been achieved thus far has laid the groundwork for a massive change of perception and the better possibility for a cleaner climate down the road.

Boulder has taken action at relieving this ongoing problem. In the city and county of Boulder, for instance, it is a requirement to deconstruct a residential building rather than demolish it. In most cases, the materials left in previously occupied buildings can be reused and recycled, ultimately bypassing the harmful environmental impact resulting from them being thrown away. The specifications regarding this rule are outlined with only residential properties in Boulder and are enacted once more than 50 percent of the exterior walls of the property are taken down. Boulder County enforces workers

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to show that 65 percent of the structural weight of that project is diverted from the landfill. Once the project is successfully deconstructed, builders have the option to either reuse the materials on site, donate them to another contractor or send them to a reuse outlet. The latter option is perhaps the most ecologically beneficial route for people to take.

The Center for ReSource Conservation is a longstanding organization in the Boulder area that heads sustainable efforts in recycling and reusing architectural materials. The company recently celebrated its 40 year anniversary and has made an outstanding impact in its cleanup practices in the surrounding community since its inception. Brandon Hill is the program director for ReSource and understands firsthand how viable the company has been for leading major change in architectural conservation in Boulder.

Photo courtesy of  
Arcadea Architecture.

"We've seen greater demand here and more donations every year we've gone along. It's just continuously gone up. Last year, here at this facility, four million pounds of material came through and we are looking to probably beat that this year," Hill said.

A major component of the business model revolves around providing a financial incentive for customers to donate the leftover materials in exchange for a tax donation certificate. This assists in offsetting some of the increased cost that comes with deconstructing a project rather than demolishing it.

"We make it a no brainer to conserve. Why would you pay someone to go to the landfill and pay the landfill to throw away a perfectly good item,

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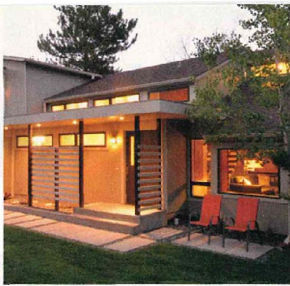
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certainly, there are things that you can do that don't cost a lot like passive heating and cooling, of course. Even adding thermal mass to a building can be relatively inexpensive, and it's a good technique in Colorado because we have such temperature shifts between nighttime and daytime. So, the more mass you have, the more it even[s] out those variations so you're more comfortable at a lower cost," Biek said.



As progressions within the dynamic of retrofitting technologies along with new ways in how they're being applied, there's a promising outlook on the different capabilities for saving energy in the years to come. These contemporary changes, nonetheless, have only very recently been embraced in the industry. Biek noted how the newer trends have been explored in the last few years.

## A balance with energy efficiency and preservation

One invaluable principal highlighted in the ruling of deconstruction in Boulder County ties into the topic of historical preservation. The Historic Preservation Advisory Board works to protect and preserve the historical and cultural value of Boulder's landmarks by reviewing demolition and alteration requests to any commercial or historical building that is 50 years or older. The complication with these structures is that they rarely meet compliance with Boulder's green energy codes. Historic buildings and houses are also often considerably difficult to renovate. Boulder County's Historic Preservation Advisory Board regularly addresses common design concerns through tips referenced under five categories. These include scale, patterns, windows, roofing materials and siding. Suggestions such as adding space without overwhelming the structure too much, replacing or repairing windows with

Interestingly, back in the late 1970's I started studying sustainable building basic approaches to saving energy but not fundamentally changed much in period of time, believe it or not. But, I'd say maybe in the last five years, there's been more development. So, that's encouraging and it's a bit of a moving target now where things are changing so quickly," Biek noted.

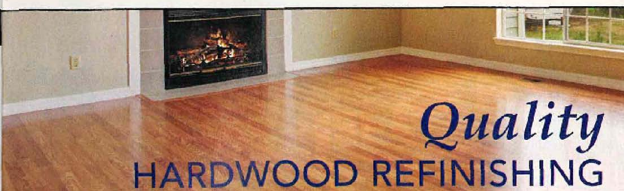
As the levels for green energy standards rise each year amongst certain local industry competitors, the push for smarter higher caliber retrofitting will more likely be something to expect soon.

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wooden frames and adding less flammable products for roofing help clients looking to change historic homes.

Larger historic landmarks can sometimes be a bit of a tougher challenge when also considering contemporary retrofitting. This creates an obstacle for architects in the green building industry working to remodel to meet those requirements. Historical landmarks and dwellings dated from the post World War 2 period, usually ranging from the 1950's and older, are almost impossible to come up to code. This forges an issue for architects looking to remodel and prepare ways to implement energy efficiency in these buildings. Older framework in a historical structure, such as lack of passive solar design or no insulation or proper mechanical elements make compliance achievable sometimes only through stripping it down to framing. Getting historic landmarks to become sustainable is not impractical. The cultural aspect that is taken into consideration by the county helps in protecting these landmarks. The architects who are exercising methods to make them certifiably green is aiding in ways to find some sensible balance with preservation and sustainability. Kirstin Snobek is a senior designer and associate at Rodwin Architecture. She has knowledge on this subject in the Boulder area.

"The historic downtown was threatened back in the 70's they were going to tear it down. That's when they knocked down the oldest school in Colorado which is where



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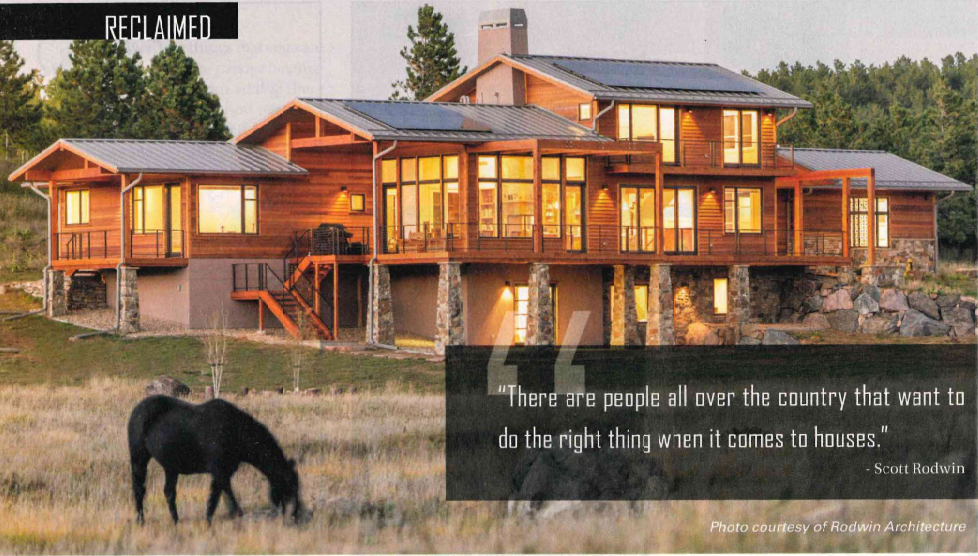


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"There are people all over the country that want to do the right thing when it comes to houses."

- Scott Rodwin

Photo courtesy of Rodwin Architecture

a burgundy, brick 1980's building is currently standing. That's when the town said, "Wait a minute. Our buildings are not being protected," Snobeck said. "We wouldn't have this beautiful downtown if it weren't protected, but there is a way to make them more sustainable."

Snobeck understands that the logistics behind achieving green and historically secure and remarkable architecture in Boulder is a trial that can be won through serious diligence and collaboration.

"You can take it pretty far. They've made these historic buildings into LEED Gold, LEED Platinum buildings and it's possible. Taking a historic building and making it something that's truly sustainable and then also still historic and beautiful takes a lot of brainpower, and it takes a huge team effort and a lot of people don't want to take that on, but it's totally worth it in the end," Snobeck said.

Snobeck described how the energy performance after restoration within a bulk of

the historic infrastructure in older architecture usually yields the same high quality as newer applications in a building. Not only can the energy performance match desired levels once retrofits are applied to certain conventions in the building, but they can also continuously be taken apart and assembled back together. This assists at eventually securing a longer life cycle for the building and making sustainable preservation a manageable feat.

A green future

Boulder is setting the stage for proving how much promise there is for green building in the industry. As green industry procedures and commodities become embraced by the market over time, prices will begin to lower, as recent trends have shown.

"There are people all over the country that want to do the right thing when it comes to houses. Of course we don't want to have high energy bills. Of course we don't want to cut down forests and build a new house. But it costs more to build green, it really does," Rodwin explained. "There are techniques that don't cost more - passive solar design does not necessarily cost more than the house designed without passive solar, but almost everything else costs more, because the performance is higher."

Rodwin concluded how many of these green products are already dropping in price because of their drive and momentum in the market.

"The price of solar panels have been dropping like a rock. When LED's first showed up in Home Depot they were \$100 a bulb and now you can get them for \$3 a bulb. So, the price has been dropping off a cliff which is great because as it gets adopted by the market and as larger manufacturers enter the market with things like solar panels, the price becomes completely competitive with conventional materials. But, when they start they always cost more, just like any new thing out there," Rodwin said.

However, recent studies reveal that green and LEED construction in Colorado is beginning to show promise as an economic stimulus. For example, according to USGBC's Green Building Economic Impact Study, the economic impact on GDP for green construction beginning in 2015, is projected to reach \$23.92 billion by 2018. This includes a total of 281,000 jobs and a total of \$16.03 billion in labor earnings. For LEED construction, data shows \$9.05 billion in total GDP, 103,000 jobs and \$6.06 billion in labor earnings.

The total number of projects accounted for LEED and green construction the last few years in Colorado affirm that the state is a top player. Last year, Colorado ranked second in the USGBC for top 10 states for LEED with an approximate total of 15,921,457 total certified gross square footage. As a variety of green building programs transition into becoming mandated by city code in municipalities nationally, the reality of a thoroughly sustainable and environmentally conscious industry becomes tangible. Brian Hludzinski is a LEED AP Green Builder and member of Colorado's Green Building Guild who specializes in building net zero energy custom homes. Hludzinski elaborated how the forward thinking endeavours by industry leaders in the private sector are making this change possible.

"Eventually it's all going to get there anyway. Look at California, they've done a statewide mandate. It'll get there eventually. It's hard now because as it becomes code, it's becoming like status quo. It's



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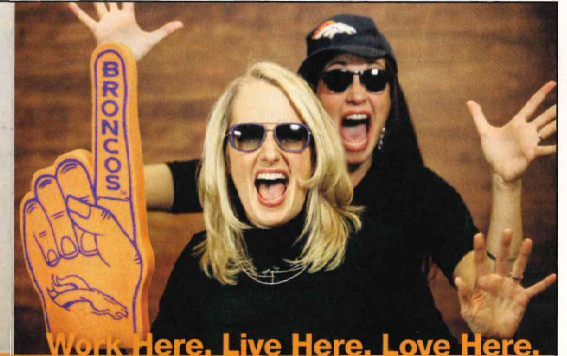


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going to be harder and harder to separate out 'this is green building and this is code.' We're essentially taking the whole industry and getting that to a better performing product where everything is completely green building," Hludzinski said. "But there is still a long way to go, don't get me wrong. I think it's great, especially with this current administration, to see how they're wanting to be more reliant on fossil fuels. It's good to see the private sector stepping up and say 'no, we are going to keep doing it this way, even though we don't have to.'"

As Boulder County continues to advance the industry in ways it hasn't been steered before, a big determining factor for the

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viability of its success in the market will result from public perception. Research proves that the green housing sector can reduce the state's carbon footprint while simultaneously serving as an economic asset, but educational outreach is the catalyst for making awareness attainable. Once people in charge of selling, building and fixing a home realize comfort, sustainability and financial congruency can all be reached as a win-win for all parties, then a domino effect has room to take hold for the movement.

"I think it's great where green building is going, but we really need to make everybody within a whole system of building a

home educated and thinking outside their scope," Hludzinski said.

Becoming informed is a logical next step. A generational reevaluation of what comfortable home living and sustainable housing stands for is what is presently being reflected in Boulder's green housing market today. Aiming toward a greener planet begins with the enlightenment on how we shelter ourselves on a daily basis and the amount of energy that we can save doing it.

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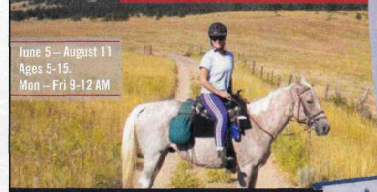


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