Adding Up the Climate Benefits of C&D Recycling

New calculator accounts for recycling's role in cutting greenhouse gas emissions

BY JENNIFER ROBERTS

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quantifies climate benefits of C&D recycling. While energy conservation may always take center stage, many experts believe that C&D recycling deserves a bigger share of the spotlight.

Wesley Sullens is a program manager with StopWaste.org, a waste-reduction agency located in Alameda County, Calif. In recent years, the agency has been looking closely at the connections between greenhouse gas emissions and waste reduction. “We have found that when building a new house in California, C&D waste and recycling saves 5.7 metric tons of CO2 emissions compared to landfiling,” he said. “That’s the equivalent of taking one car off the road for a year.”

Research spearheaded by StopWaste.org shows that for homes built to meet the standards of GreenPoint Rated, a consumer label for green homes in California, the emissions reductions of C&D recycling are achieved through energy efficiency and renewable energy generation, at least for the first few years of occupancy.

“If we were more widely understood, Sullens believes it would not only provide a boost to the C&D recycling sector but also help cities and states more quickly reach their targets for cutting greenhouse gas emissions. “municipalities are under the gun to get emissions down fast. Ramping up C&D recycling can be one of the most effective ways to do that,” Sullens said.

The Waste Stops Here

StopWaste.org operates as one integrated public agency comprised of the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board. Funded by waste disposal fees, the agency promotes source reduction, residential and commercial recycling, recycled product procurement and market development, technical assistance, and public education.

StopWaste.org serves the county and 14 cities of Alameda County, as well as two sanitary districts that provide refuse and recycling collection services. Although local in scope, the agency is a national leader in developing solutions to reduce waste of C&D material and other resources. One of its most influential projects is the Residential Green Building Guidelines for single-family and multifamily homes.

“We originally developed the Guidelines in collaboration with and for the benefit of the local residential construction industry, but now the Guidelines are in widespread use throughout California,” said Sullens. “We also manage construction and demolition recycling and green building projects for StopWaste.org.”

Tallying Savings

In 2008, StopWaste.Org launched a new initiative, the GreenPoint Rated Climate Calculator, in partnership with two organizations, the California-based nonprofit group, Build It Green, and ICF International, an international organization that provides local governments with technical consulting on sustainable development. Much of the research and programming was done by KEMA Services Inc., a green building consulting firm.

The GreenPoint Rated Climate Calculator is “the nation’s first third-party certified residential green building calculator created to measure the greenhouse gas emissions impacts—beyond just energy—of building green homes,” said Tenaya Amin, program manager, GreenPoint Rated.

The Climate Calculator was created as an adjunct to the GreenPoint Rated program, a consumer label for green homes in California developed jointly by StopWaste.Org and Build It Green. Inputs for the calculator are collected by third-party certified GreenPoint Raters; output data is available to be expected by the end of this year in a web-based program.

GreenPoint Rated homes are built to surpass California’s building and energy code requirements, with features like improved insulation, sealed ducts, energy- and water-efficient appliances, solar electric and solar hot water systems, high efficiency toilets, and landscaping designed to reduce water use and green waste.

The new Climate Calculator quantifies the emissions avoided when building a GreenPoint Rated home or using green remodeling practices by comparing the carbon footprint of the GreenPoint Rated home to that of a conventionally built home. “When a house undergoes the GreenPoint Rating process, the third-party rater uses the Climate Calculator to generate data on greenhouse gas emissions avoided,” said Sullens.

ICLEI and KEMA provided technical support when it came to analyzing methodologies for attributing greenhouse gas emissions to green building features like energy efficiency, water savings, and C&D reuse and recycling. The Climate Calculator also tabulates non-CO2 savings, including tons of waste, gallons of water, kilowatt-hours of electricity, and thousands of natural gas.

Carbon footprint calculators and private-sector and public-sector carbon inventories typically include greenhouse gas emissions from sources that are relatively easy to quantify, like electricity consumption and transportation. What makes the GreenPoint Rated Climate Calculator unique is that it also quantifies savings from C&D recycling.

“Recycling is often left out because it’s considered indirect and too difficult to quantify,” said Timon Hoek, who works on green building programs for the U.S. Environmental Protection Agency’s Pacific Southwest region. “But times are changing.”

Upstream & Downstream Benefits

To add up the carbon savings from C&D recycling, the GreenPoint Rated Energy, on the other hand, gets most of the glory. By now, building designers, contractors, and developers have gotten the message that energy efficiency and renewable energy are the tickets to decreasing a building’s carbon footprint.
Behind the Numbers

Currently, the GreenPoint model calculates the number of carbon credits sold for each home. A home with a score of 100 will be sold 100 credits, while a home with a score of 0 will be sold 0 credits. The GreenPoint model is designed to be transparent and easily understood by consumers.

A representative green home would have the following credits:
- Energy Savings (50%)
- Water Efficiency (30%)
- Indoor Air Quality (10%)
- Recyclability (5%)
- Material Selection (5%)

The total number of credits sold for a home is calculated by multiplying the home's score by the number of credits per point. For example, a home with a score of 80 would sell 80 credits at 0.5 credits per point, resulting in 40 credits sold.

Conclusion

The GreenPoint model is a powerful tool for calculating the benefits of sustainable construction practices. By quantifying the impact of these practices, the model helps builders, architects, and clients make informed decisions about the environmental impact of their projects.
after construction, according to the Climate Calculator research (Sec Table 2). After 10 years, the relative impact of recycling C&D waste shrinks because the savings do not accumulate over time; however, that one-time occurrence of C&D recycling still accounts for a significant 24% of the home's cumulative emissions reductions. Giving C&D Recycling the Respect It Deserves

Although C&D recycling happens only once for a particular project, the climate benefits are actually more enduring from the community's perspective, Sullens explained. "Building construction and demolition are ongoing activities, so cities and local governments should consider waste an ongoing source of greenhouse gas emissions."

Since most carbon footprint calculators and greenhouse gas inventory tools don't fully account for the upstream and downstream benefits of C&D reuse and recycling, public policy and private decisions get steered toward energy efficiency while reuse and recycling take a back seat. "The GreenPoint Rated Climate Calculator is a step toward restoring balance, not just in the public policy realm but also for the climate," said Sullens. "Generally only those emissions that are quantified upfront in an initial greenhouse gas inventory are prioritized and acted upon. Policymakers and people in the waste management industry can help speed us toward a lower carbon society by making sure the benefits of C&D recycling are taken into account. It's less sexy than renewables or energy upgrades in homes, but in most markets--especially in California--recycling waste is much more cost effective per ton of carbon saved."

Resources
- GreenPoint Rated: www.BuildItGreen.org/groupspointrated
- LEED 2009 Rating Systems: www.usgbc.org

Author Information
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