



How Construction Projects Can Achieve Zero Waste and Net-Zero Goals While Saving Resources

Introduction

Mitigating harmful effects on Earth's biodiversity, water resources, ecosystem services, ocean temperature, and more is top of mind for organizations of all kinds around the world.¹ No region is immune to these effects. Without changing the status quo and mitigating carbon dioxide (CO₂) emissions, this will be a continued problem for generations to come. Given the severity of the climate change problem and the role of businesses releasing carbon emissions, many of them want to start changing their practices today to reduce their environmental impacts and place sustainability at the center of their strategic plans.

However, businesses must start changing their practices now to embrace sustainability and environmental considerations. This behavioral shift also includes adopting net-zero goals in addition to zero waste practices for construction and demolition (C&D) materials. In particular, the construction industry has a very large carbon footprint and consumes a lot of resources. Further, the construction industry accounts for approximately 40% of greenhouse gas (GHG) emissions, mostly due to the resources used in addition to heating, cooling, and lighting of buildings and infrastructure.² In the United States, the construction and building sector was responsible for 36% of final energy use and 39% of energy and process-related carbon dioxide emissions in 2018.³ Steel, cement, and glass alone contributed 11% of this amount.

Additionally, the construction industry generates a lot of waste, which also contributes to more GHG emissions from the extraction and production processes, while at the same time putting more pressure on landfills. Many construction materials are not being reused or recycled, in particular steel, wood products, drywall and plaster, brick and clay tile, asphalt shingles, concrete, and asphalt concrete.⁴ While some materials can be placed in to the "next use" market, other materials cannot be reused or recycled so easily. What are the current solutions for hard-to-recycle materials in the construction space?

Fortunately, some key companies have developed innovative sustainability methods to handle this type of problem. They can help the construction industry think about their carbon footprints and reduce and recycle construction materials more effectively.



How Net-Zero, the Circular Economy, and Corporate Sustainability Apply to the Construction Industry

To begin the journey towards sustainability, construction companies should understand the concepts of GHG emissions, net-zero goals, and how their activities contribute to climate change.



Why is Achieving Net-Zero Important?

GHGs are at their highest concentration in two million years. The main greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, and fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride). The increased amount of greenhouse gas emissions in the atmosphere traps heat within the climate system, which in turn warms the land, oceans, and atmosphere. In 2020, carbon dioxide was measured at 149% of pre-industrial levels, methane (CH₄) was at 262%, and nitrous oxide (N₂O) was at 123% above 1750 levels (pre-Industrial Revolution baseline year).⁵

Carbon emissions will need to be peak in the next three years to have a chance of meeting the Paris Agreement's goal of 1.5°C warming.⁶ To meet this goal, the world must reduce their average GHG emissions by half, which is currently estimated at 60 gigatons of CO₂ equivalent (GtCO₂e).⁷ Further, according to scientific studies, human society only has eight years to take off an additional 28 GtCO₂e of annual emissions, over and beyond what is currently pledged by UNFCCC party countries. Otherwise, the 1.5°C temperature goal will be out of reach.

According to the Intergovernmental Panel on Climate Change (IPCC), the years 2030 and 2050 are pivotal points for our environment. The IPCC's Special Report on Warming of 1.5°C identified the need for global decarbonization by 2050. Countries around the world





pledged their net-zero goals, including the United States, which declared its reduction of net GHG emissions by 50-52% in 2030.⁸ In response, the United Nations (UN)-backed global campaign rallying non-state actors—including companies, cities, regions, financial, and educational institutions—to take rigorous and immediate action to halve global emissions by 2030. The Race to Zero campaign involves 1,049 cities, 67 regions, 5,227 businesses, 441 of the biggest investors, and 1,039 Higher Education Institutions.⁹ Comprising 25% global CO2 emissions and over 50% Gross Domestic Product (GDP), these actors joined with 120 country parties to pledge to achieve net zero by 2050. Given its carbon footprint and use of raw materials, the construction industry will have a significant role to play in achieving this goal.



The Circular Economy Positively Impacts the Construction Industry

Net zero goals also tie into the concept of the circular economy. According to the UN's International Resource Panel, natural resource extraction and processing contribute to about half of all global GHG emissions.¹⁰ The future of industry is circular, and a materials transition is a part of the net-zero process.¹¹ A circular economy keeps materials, products, and services in circulation as long as possible, which would include C&D materials.¹² It aims to reduce the negative lifecycle effects of materials, including climate impacts, as well as adopt lower impact ways to produce materials to help realize global net zero goals.

For the construction industry, embracing the circular economy provides an opportunity for companies to reduce their carbon footprints and adopt innovation. For example, the company Holcim launched its green cement program, which uses 20% recycled construction and demolition waste.¹³ The construction industry can move away from extraction, production, use, and elimination of resources (especially those that end up in landfills) and embrace C&D waste as a valuable resource.



Embracing Corporate Sustainability

Further, corporate sustainability applies to reducing companies' carbon footprints, especially in the construction sector. Corporate sustainability is the concept of companies delivering goods and services in a sustainable manner.¹⁴ It typically falls under the "environment" category for environment, social, and governance (ESG) targets, as well as a part of corporate social responsibility. "Sustainability," in general, is described as meeting today's needs while saving resources to use tomorrow.

As applied to the construction industry, corporate sustainability will be imperative to identify the best practices and which companies are walking the walk to become greener and achieve net zero goals. The construction industry can take the lead on reducing energy use, water resources, and carbon dioxide emissions as well as committing to net zero goals by 2050.

The construction industry is one of the biggest emitters of carbon dioxide and other GHGs. However, by embracing net zero goals, understanding the circular economy, and adopting sustainability, construction companies can become greener, especially if they implement methods to reduce, reuse, and recycle C&D materials.



Taking the Next Step Towards Sustainability and Achieving Net-Zero Goals

While it may appear like a monumental task for many construction companies, today there are more tools than ever for the construction industry to use to become more sustainable and achieve net zero. Plus, construction companies can take the initiative to be leaders in their industry, get ahead of regulatory changes, and appeal to a new customer base that wants greener practices.





Construction companies should care about sustainability and net zero. First, many customers demand sustainability standards, and they are becoming the norm. If companies do not change, many will lose business as customers become more sustainability focused.

According to a recent global survey, 47% of respondents said that sustainability is a top or major concern for companies.¹⁵ Further, the data revealed that 59% said a sustainable supply chain is a competitive differentiator. Sustainability helps improve the bottom line by creating closed loop solutions within the business. Rather than having to outsource for materials, companies can get innovative by recycling and reusing C&D materials for in-house projects. Plus, the cost of raw materials continues to climb.

While construction companies may want to be greener and adopt sustainability practices, realistically, many problems are in the way of this progress. Currently, no universal regulations exist across municipalities and states, so construction companies have to attempt to abide by a patchwork of varying rules across different jurisdictions. Also, a number of diverse vendors are trying to occupy the sustainability space in addition to different vendors and circular economy solutions vying for attention, all of which make the process confusing. Many construction companies also lack visibility into their own sourcing and supply chains, so they don't understand how sustainability can help with both "greening" and improving the bottom line. It can be time-consuming and confusing to locate the right answers for individual C&D projects for construction companies.

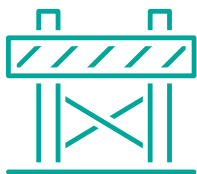
So, now that the problems have been identified, how do construction companies advance sustainability goals and achieve green certifications? For starters, the construction industry can move away from extraction, production, use, and elimination of resources (especially those that end up in landfills) and embrace C&D waste as a valuable resource. They can create long-term goals for becoming more sustainable by adopting a strategy that considers

their carbon footprint and net-zero goals from start to finish. Embracing new technology solutions can be an enormous help. Certain companies have designed smart building solutions through Internet of things (IoT) devices and apps to track data in real time. Others have designed software to improve the design of buildings to be greener and more efficient, thereby requiring less materials. Construction companies can focus on sourcing new materials that are greener, more sustainable, and have a smaller carbon footprint.

Despite their contribution to GHGs, the construction industry can take the lead for other large industries by pledging net zero goals and reducing their carbon footprints. Importantly, there are efforts that need to be made to advance and enhance construction and demolition recycling capabilities across the United States to reduce the amount of wasted C&D materials being produced and thrown out into landfills.

Industry leaders in this space can distinguish themselves from the pack by embracing the circular economy, net-zero goals, and committing to sustainability for the long-term. Construction companies who set the example are ensuring discarded materials can be processed for optimal reuse; harnessing innovation to recycle that which was previously toxic and not recyclable; and are doing no harm to the environment while doing good by the economy and supply chains.

For construction companies who want to become net zero and more sustainable, Rubicon® can help. Whether it's for a global enterprise or an independent business, Rubicon can help you turn your rubble into a renewable resource.¹⁶



About Rubicon's Services for Construction Space

Rubicon is a digital marketplace for waste and recycling, and provider of innovative software-based products for businesses and governments worldwide. Striving to create a new industry standard by using technology to drive environmental innovation, the company





helps turn businesses into more sustainable enterprises, and neighborhoods into greener and smarter places to live and work. Rubicon’s integrated app platform enables construction companies to monitor, track, and understand how C&D materials can evolve from only being “waste” to becoming a commodity that can be reused and recycled, such as through the RUBICONMarketPlace.¹⁷

Rubicon delivers its waste and recycling services through an extensive network of more than 8,000 vendor and hauler partners, 90 percent of which are small, independent businesses. Our programs span cardboard (OCC), plastic, paper, metal, glass, electronics recycling, C&D materials management, organics recycling (including food waste and composting services), and single-stream recycling (SSR).



Key Considerations

Rubicon provides information on how to advance sustainability goals and achieve certifications during construction projects. Plus, Rubicon’s platform identifies information in real time for companies to reduce their use of resources. It’s becoming easier than ever before for construction companies to achieve net zero goals and zero-waste targets.

Additionally, construction companies will have a number of benefits by adopting more sustainable practices. They will save time and energy by finding ways to recycle hard-to-recycle materials in the construction space. They will be able to identify opportunities for additional cost savings and resiliency in their supply chains. Construction companies will be able to develop a holistic, environmentally-sound strategy to benefit your business, the planet, and your local community: by reducing carbon emissions, using less energy and natural resources, and decreasing the amount of C&D waste that ends up in our already overburdened landfills.

Conclusion

For sustainability-minded companies operating in the built environment, diverting as much would-be-waste from landfills as possible is now a desirable practice. Today, what distinguishes the net-zero leaders from the laggards is how they are driving the circular economy forward—ensuring discarded materials can be processed for optimal reuse, harnessing innovation to recycle that which was previously toxic and not recyclable, and doing no harm to the environment while doing good by the economy and supply chains.

Rubicon can assist the construction industry with becoming greener with our innovative sustainability methods. Rubicon provides enhanced visibility into your waste management services. These services means deeper insight into your waste streams, informed decision making, and increasingly efficient action taken across locations and projects. By identifying landfill diversion opportunities as well as designing and implementing solutions to deliver on them, we'll help you save time and minimize waste throughout your organization. Rubicon can help your company find new ways to turn your rubble into a renewable resource.¹⁸

1. (IPCC, 2022: Summary for Policymakers. In: Climate Change 2022: Impacts, Adaptation and Vulnerability)
2. (Müller, Krick & Krick, 2022)
3. (IEA, 2019)
4. ("Sustainable Management of Construction and Demolition Materials | US EPA", 2022)
5. ("WMO Greenhouse Gas Bulletin (GHG Bulletin) - No.17 | E-Library", 2021)
6. (IPCC, 2022: Summary for Policymakers. In: Climate Change 2022: Mitigation of Climate Change)
7. (UNEP, 2021)
8. (The White House, 2022)
9. ("Race to Zero Campaign", 2022)
10. ("UN calls for urgent rethink as resource use skyrockets", 2019)
11. (Enkvist, Klevnäs, Westerdahl & Åhlén, 2022)
12. ("What is a Circular Economy? | US EPA", 2022)
13. (Schmidt, van Weyenburg & Jenisch, 2021)
14. (Bettie, Scott & Munichello, 2021)
15. (SAP Brandvoice, 2021)
16. ("Rubicon | Smart Waste and Recycling Solutions", 2022)
17. ("About Us | Rubicon", 2022)
18. ("Get Started | Rubicon", 2022)