Construction ESG 101

An Introduction to Jobsite ESG Tracking for General Contractors



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History of Carbon Tracking in Construction

Green Badger has been streamlining and automating green construction compliance from LEED documentation automation for years and is now working to solve the emerging challenge of Construction Environmental, Social, and Governance (ESG) benchmarking.

Traditionally the industry has spent prior years looking at the sustainability of the building itself. What is the building made of, are the products selected for the building healthy, where are the products coming from, and what's going on inside the building in terms of indoor air quality?

The construction industry as a whole has been focused here as well. Talks around carbon and energy have been in terms of once the construction of the building is complete and occupied. What is the building's EnergyStar score? What do the building's utility bills look like?



The Evolution of the Green Construction Industry

The green building industry has realized the need to broaden the scope of its carbon tracking. It's no longer just what carbon building occupants produce, but what's the embodied carbon of the materials themselves. Environmental product declarations, the EC3 calculator, and advanced LCA software are beginning to crack that materials challenge.

That still leaves a gap between the product or material creation and the end building's carbon and energy impacts. That gap consists of the months or years of construction activities required to transform those materials into the buildings we work and live in today.





Construction ESG Tracking: Where to Focus

As a general contractor or developer, if you haven't been asked for ESG metrics yet, you will. From voluntary initiatives like the

Contractor's Commitment to proposed regulatory carbon disclosures from the SEC to the growing number of sustainable impact investors and companies with their own net-zero carbon goals, the demands to incorporate ESG data and benchmarking is driving challenges and opportunities across an organization. While ESG reporting is growing in importance, companies are still learning about how to track and report ESG metrics across their construction portfolio and how to measure ESG impact and success. Environmental metrics that are rising to the forefront include energy consumption, carbon emissions, water use, and waste generation and diversion. Social metrics include minority and women own business enterprise inclusion, local participation, and even project-based philanthropy. Governance metrics tend to originate at the corporate level, and it is still being evaluated how it may relate on a project by project basis.



Purchased Electricity

Purchased electricity comes from the project's utility provider and is used for temporary power for the project, the job trailer, site lighting, and electrical equipment. For projects with a temporary meter, obtaining consumption data is as simple as finding the kilowatt-hour (kWh) usage on the monthly bill from the utility. It helps to track both kWh and cost so that teams can see the economic benefit of efficiency as well as the environmental impact.



Natural Gas/Propane

Natural gas and propane can be utility provided or via canister from vendors, and is used to power equipment, generators or heaters. If it is utility provided, it will be metered and can be tracked from monthly bills. If it is bottled, vendors can provide invoices each time they replace/exchange cylinders.



Diesel/Gasoline

Diesel and gasoline power internal combustion engines for vehicles, heavy equipment and some small equipment. While fuel purchases can be straightforward to track if they occur on site, tracking consumption of equipment that comes pre-filled will require more diligent coordinate and reporting with the subcontractor or equipment provider.



Energy & Carbon Relationship

The project is responsible for all energy consumed on site and purchased electricity, all of which translates into carbon emissions and is often the first step in carbon benchmarking.

Transportation emissions associate with the project (product transport, jobsite commute) and even the embodied carbon of the construction materials themselves can also be accounted for. The breakout of carbon accounting is summarized in the callout to the right.

Carbon Emissions by Scope

- Scope 1 Emissions: Purchased Fuels this could be natural gas for generators, or liquid fuels like diesel for heavy equipment
- Scope 2 Emissions: Purchased Electricity jobsite temporary power for running the project
- Scope 3 Emissions:
 - Product Transport or the emissions associated with getting products from the manufacturer/distributor to the project
 - Commute whether it is the GC's team or all onsite subcontractors – tracking emissions associated with getting to and from the project each day
 - Business Travel other travel associated with the project

Embodied Carbon: the carbon associated with materials themselves



Purchased Electricity Jobsite temporary power for running the project.



Product Transport Emissions associated with getting products to the project.



Purchased Fuels Natural gas for generators, or liquid fuels like diesel for heavy equipment.



Commute Tracking emissions associated with getting to/from the project each day.



Business Travel Other travel associated with the project.



Embodied Carbon The carbon associated with the materials themselves.



Energy and Carbon Relationship, cont.

On-site, direct combustion energy results in carbon accounting terms as Scope 1 emissions, or direct emissions. They occur on site as that is where the fuel is actually combusted.

Purchased electricity is considered Scope 2, or indirect emissions. The actual emissions occur at the power plant miles way where its original fuel source is combusted. However, since the project uses the end electricity on-site, they are responsible for those carbon emission as well.

Carbon resulting from energy consumption is a typical first step teams take when starting their carbon accounting journey. Set quantities of fuel are often known through invoices and bills. The next step is converting those quantities into carbon emissions.

Calculating carbon from these various fuel sources can be complicated, but there are standards conversions available from the US Environmental Protection Agency (EPA) and the US Energy Information Administration. They provide values of carbon per unit – for example, 1 gallon of diesel results in roughly 22.4 lbs of carbon emissions. For fuels like gasoline, diesel and natural gas, these conversion rates are standard across the United States.

For electricity, it varies where you are in the country as each utility and powerplant has their own blend of source fuels (coal, natural gas, hydropower and other renewables. Carbon is calculated be a region specific or area specific coefficient dependent on the fuel blend. The EPA provides these in broad regions based on the Emissions & Generation Resource Integrated Database (eGRID).

Depending on fuel mix, some regions have much cleaner electricity and thus result in lower emissions per kWh. Thus a project in Portland, OR will be responsible for much less carbon than a project in Detroit, for the same amount of electricity use.

Sort A to Z



CO₂ total output emission rate (lb/MWh) by eGRID subregion, 2020



Sort by Amount

IMAGE VIA EPA.GOV/EGRID/DATA-EXPLORER





Energy and Carbon Relationship, cont.

An even more precise way to measure carbon from electricity consumption is to utilize zip code level data from the EPA. Rather than a regional average, you can measure by precise location (Green Badger's carbon calculations are based on project zip code to be as precise as possible).

For project team's tracking manually, there are a number of excel calculators that can help with these conversions. For those using Green Badger, simply log your various fuel consumptions and you'll be able to report carbon by fuel type, total carbon, and evaluate energy consumption and carbon emissions over time.

Scope 3 emissions can be even more challenging for teams to capture.

Scope 3 includes product transport (materials coming to site from the manufacturer or distribution centers), daily commute to the jobsite, which can include the entire general contractor team as well as subcontractors, and finally any business travel related to the project. Examples include team members flying in for site visits or meetings with the owner/reps. Variables include vehicle types, frequency of trips, and length of travel.

Finally, there is the embodied carbon of the materials themselves. Tools like the EC3 calculator are helping teams identify what the overall embodied carbon of various materials is and helping to identify lower-carbon alternatives. Embodied carbon consists of the emissions associated with the raw material extraction, transportation and finally manufacture of the end product.





Waste Generation & Diversion

One of the more common ESG metrics is waste generation and diversion. Projects pursuing third-party certifications such as LEED have been track on waste diversion for the last 20 years, and having goals of 75% waste diversion are common. Waste is one of the few ESG metrics that project teams may already have established goals for (many project teams are still in the benchmarking phase for energy/carbon and haven't established what qualifies as "good"). Waste also has the luxury of being relatively standard across the country and by differing project types. Waste management is evolving as ESG requirements are growing. Historically, just having a diversion goal of 75% or higher was the standard. Now project teams are focusing on not just how much they are able to recycle, but how waste can be minimized to begin with. Careful project planning, prefabrication and right-sizing are leading a trend towards waste minimization, and establishing metrics around waste generation per square foot project. This is an important efficiency metric, as there are costs (both financial and environmental) to waste diversion.





Water Consumption

A final environmental metric being tracked is project water consumption. This includes water originating from a municipal tie in to tanker trucks of water used for erosion control measures for dust control, landscape establishment, and other uses. Water consumption can be measured in two ways - potable water (water treated for human consumption) or non-potable water (collected rainwater, treated building water - not intended for human consumption). As with anything in construction, water consumption is dependent on construction type. Onsite batch concrete plants, for example, will require significantly more water than other projects. Interior projects might not have any recordable water consumption. This shows the growing importance of being able to track ESG metrics by project type and location, as it is often not an apples to apples comparison.





Social Metrics

Social metrics in construction are not new. In fact, many are required on publicly funded projects. The growing importance of ESG is translating those metrics on every project, not just the few that require it.

Minority/Women Owned Business Enterprises (MWBE) and Local Participation

Perhaps the most common metric to track is MWBE participation, which means providing meaningful participation to MWBEs as subcontractors or suppliers in the performance of this construction project. This is often measured as a goal based on contractual dollar value of MWBE owned companies compared to the overall contract value. For example, if a project has a 20% MWBE goal and a total contract value of \$10 million, then at least \$2 million would need to be awarded to subcontractors or supplies that are owned by MWBE. There are other entities, such as Small Business Entities and Local Business entities, that also see performance goals established. Business can count across multiple classifications as well - a small, local, womenowned business would contribute to all three project goals.

Local participation varies in definition and organizations standardizing ESG will needs to determine what is appropriate for them in the markets they work in. Whether a goal is set by radius (within 25 miles of the project), region (Coastal Georgia), or zip code, organizations will need to determine their own measure of success.

Project Philanthropy

A final metric that some project teams are benchmarking is project philanthropy - have a goal of either financial contributions or volunteer hour participation from a project team and their subcontractors. This is highly company specific there's not an industry benchmark to establish, and can vary greatly depending on market, project size and project duration.



Green Badger's Construction ESG Platform

Green Badger's software has evolved to help teams and organizations adapt to the new requirements affecting the construction marketplace. The new Construction ESG portal bridges the gap to specifically track, benchmark, and then help reduce the carbon, waste, water, and energy impact of the construction process itself.

The construction ESG software also includes tracking capabilities for on-site wellness opportunities and other functionality to help general contractors show compliance with the Contractors Commitment, as well as be able to easily report back to owners who are starting to capture construction activities as part of their own environmental footprint. Soon-to-launch metrics address the social and socio-economic impact projects have as well. ESG data has become a standard in commercial real estate and is now being driven into construction and development-related activities. As an owner, construction activities fall into your scope of reporting. As a general contractor, your organizational or project goals require accurate reporting and instant availability. Green Badger's construction ESG software provides a scalable, intuitive solution that isn't a time burden – whether tracking on an individual project or across an organization.

Whichever path you choose to follow, Green Badger's Construction ESG platform makes tracking as simple as possible. For carbon tracking, as with most new endeavors, if the process is difficult and cumbersome to complete with confidence then it has much less chance of success.





Green Badger offers an intuitive user experience so the team will know where each project stands versus overarching corporate goals, as well as organizational dashboards that let companies see how they are performing at a corporate level.

The data analytics offered within Green Badger's Construction ESG platform help provide actionable information. As organizations start to set reduction goals, they can target where they will have the biggest impact. In the end, incorporating construction ESG at the project level is becoming exceedingly relevant, from your own internal corporate goals to owner requirements that are asking you to provide this information. We're working to provide a comprehensive solution for construction ESG metrics and green building certifications to make this process as simple and efficient as possible.

To see how Green Badger's Construction ESG platform can take your sustainability reporting to the next level, schedule a demo with us today.

getgreenbadger.com/construction-esg-platform

