



EMBODIED CARBON ACTION PLAN

2021

CLARKNEXSEN

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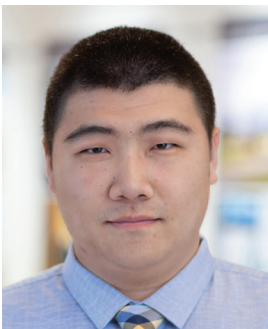
CLARK NEXSEN SE 2050 LEADERSHIP TEAM



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A NOTE FROM OUR TEAM

At Clark Nexsen, we share the belief that achieving net zero embodied carbon in all structures by 2050 is an enormous task that our industry must conquer. Our structural engineers are committed to reducing embodied carbon in current and future projects as required by the SE 2050 Challenge and aligned with the firm's goals for Integrated Design. We are taking the steps now to understand and engage our staff and clients in designing structures with very low and zero carbon impact. We acknowledge the importance of meeting this goal for our environment and future generations. Clark Nexsen recognizes that for projects to be 100% clean, both operational and embodied carbon must be 0%.

An aerial photograph of a city skyline, likely Atlanta, featuring prominent skyscrapers like the SunTrust Building and the Georgia State Capitol dome. The image is overlaid with a semi-transparent blue filter. The text "SE 2050 COMMITMENT" is centered in white, bold, sans-serif capital letters.

SE 2050 COMMITMENT



January 7, 2021

Laura Champion, Director
Structural Engineering Institute

Letter of Commitment to the SE2050 Program

Laura:

Clark Nexsen, Inc., a 350-person design firm headquartered in Virginia Beach, VA, is hereby signing on to the SE 2050 Commitment Program. We support the vision that all structural engineers must understand, reduce, and ultimately eliminate embodied carbon in their projects by 2050.

We understand embodied carbon reduction is key to combatting climate change, and that structural engineers have a critical role in reducing carbon in building materials. In order to achieve net zero embodied carbon, we must act now. Our structural engineers collaborate with other design disciplines in pursuit of the SE2050 Commitment Program and the 2030 Challenge for Embodied Carbon put forth by the American Institute of Architects.

We therefore commit Clark Nexsen to take the following steps as part of the SE2050 Commitment Program:

1. Within six months and annually henceforth, we commit to reporting an Embodied Carbon Action Plan (ECAP) and permit the ECAP document or form be made public on the SE2050 website.
2. Within one year and annually henceforth, we commit to submit data to the SE2050 project database in a collaborative effort to understand embodied carbon in structural engineering projects and to set attainable targets for future projects.

We look forward to joining this coalition and industry effort to achieve the goals of the SE2050 Program.

01/07/2021

SIGNATURE

DATE

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EDUCATION

SE 2050 Pledge

We publicized our pledge to join the SE 2050 Commitment internally and externally. Statements were posted on our internal website, social media accounts, and our external corporate website: www.clarknexsen.com/articles/clark-nexsen-joins-the-se-2050-commitment-to-reduce-embodied-carbon-in-structural-systems/

Our Embodied Carbon Action Plan will be posted to our website.

Embodied Carbon Reduction Champion

Our Embodied Carbon Reduction Champion is Peter Allen, PE, SE, LEED AP BD+C, structural department head in our Virginia Beach office. Peter has 25 years of experience as a practicing structural engineer and has been a LEED accredited professional since 2011.



The graphic features a blue square with a white 'f' (Facebook), a white bird (Twitter), and a white 'in' (LinkedIn) on a dark blue background. To the right, the text 'SE2050' is displayed in large, bold, blue letters, with 'SE' in black. A blue arrow curves from the top of the '2050' back to the 'SE'. Below this, the text 'COMMITTING TO ZERO' is written in bold, black, uppercase letters. The background of the graphic is a light gray with a diagonal line pattern.

Clark Nexsen Joins the SE 2050 Commitment to Reduce Embodied Carbon in Structural Systems

FEB 22, 2021

Clark Nexsen is among the first architecture/engineering firms to sign the Structural Engineers (SE) 2050 Commitment, taking a formal pledge to a path of substantive embodied carbon reductions within structural systems. The goal of the movement is to provide an accessible sustainability program for individual structural engineers and engineering firms. With an accountable strategy of active engagement on projects and consistent information sharing, committed firms will work towards achieving zero net carbon structures by 2050.

EDUCATION

Education Program

The group of structural engineers who developed this action plan will lead efforts to educate our colleagues, clients, and partners on reducing embodied carbon. We have made presentations to structural engineers firmwide on the SE 2050 Challenge and embodied carbon. We will continue presenting material and providing learning opportunities with webinars and published articles.

In the fall of 2021, we plan to present at least one of the Boston Society for Architecture's "Embodied Carbon 101" webinar recordings. This presentation will be made available to engineers and architects in all of our offices.

Embodied Carbon Interest Groups

In 2020, Clark Nexsen created an interdisciplinary Embodied Carbon Research Group (ECRG) to elevate the importance of embodied carbon in our design work. The group is focused on our commitments to both SE 2050 and the AIA 2030 Challenge for Embodied Carbon. An SE 2050 sub-group was assembled to develop this action plan.

The ECRG leads the firm in learning and implementing life cycle analysis and data collection tools, with the goal of including embodied carbon evaluation as a regular practice. This group is responsible for educating our professionals on carbon reduction strategies, developing workflow processes, and establishing and tracking embodied carbon reduction goals.

The SE 2050 group will focus on educating our structural engineers on good design practices, data collection, and life cycle assessments (LCAs). Information will be maintained on a firmwide intranet site, providing access to everyone. Regular posts are made on Microsoft Teams to educate staff on the SE 2050 Commitment.





REPORTING

REPORTING

Measuring | Tracking | Reporting

Over the last few years, Clark Nexsen has measured the embodied carbon for building materials, including structural materials, on a select number of design projects. As we move forward to meet the SE 2050 Challenge, we will engage more employees and provide more in-house training. We will begin by selecting a few projects each year to conduct embodied carbon research.

Clark Nexsen has experience with measuring embodied carbon through software such as Tally and EC3. We plan to use Revit's Tally plug-in to quantify materials and then upload this information into EC3. We will use EC3, in addition to available Environmental Product Declarations (EPDs), to perform LCAs.

At present, we plan to perform the LCA of a building from initial raw material extraction to the end of life and final recycling of building components. As we gain knowledge, we will review different methods for measuring embodied carbon based on the type of design project.

In 2021, we plan to perform LCAs at the end of design. Once we better understand the process, we intend to measure embodied carbon at each design submittal.

Training

A group of four structural engineers has been formed to lead the SE 2050 effort. In addition to this group, other employees have been involved with embodied carbon measurement, LCAs, and other sustainability tasks. We will utilize all our experience and provide further training to our structural engineers. To gain knowledge, we will attend seminars, watch online training videos, and share articles on our internal SE 2050 Microsoft Teams channel. We also plan to educate employees company-wide by presenting this topic in meetings, sharing our progress and research data, and conducting regular discussions with project managers beginning at project conception.

SE 2050 Database

We plan to track and compare the embodied carbon data on our projects using Power BI. We will report this data annually to the SE 2050 database. Our structural engineers operate from three different offices in the U.S. We plan to submit a minimum of two projects from each of two offices, and one from our third office, totaling a minimum of five projects annually submitted to the nationwide SE 2050 database.



REDUCTION STRATEGIES

REDUCTION STRATEGIES

Education | Reduction

For 2021, education on embodied carbon is our focus. Once our structural engineering department has gained sufficient knowledge on embodied carbon measurement and reduction, it is essential that we educate the other disciplines in our firm on the embodied carbon reduction strategies we are using in our designs. We will engage in open discussions regarding embodied carbon with our clients. We will then seek input from our team members and our clients on which carbon reduction strategies to implement on projects. We are building an in-house database of projects in Power BI to track embodied carbon quantities, which we plan to upload to the nationwide SE 2050 database annually. Once we determine our embodied carbon benchmark and compare to the industry, we will set future goals and refine our strategies to lower our benchmark each year.

Data Visualization

As previously mentioned, Clark Nexsen is developing a project database to track embodied carbon. This database will also be used to track project cost. We should then be able to relate the cost of implementing various embodied carbon reduction strategies. We can use this information to demonstrate to a client the value of starting an LCA early in design to have the opportunity to make adjustments for sustainability as well as cost.





ADVOCACY

ADVOCACY

Knowledge Share

At Clark Nexsen, we believe that open sharing of knowledge is crucial to setting attainable targets for embodied carbon reduction in our industry with the goal of carbon-free structures by 2050. A future goal for Clark Nexsen is to mentor a firm on implementing SE 2050 practices into their structural designs to track and reduce embodied carbon in their own projects. We will also continue to educate clients on embodied carbon and reduction strategies through sustainability and Integrated Design workshops.

Collaboration

At Clark Nexsen, we believe that “together we discover, inspire, and shape ideas that transform our world.” We invite our clients to partner with us to understand embodied carbon and evaluate the environmental impacts of each project, with the goal of reducing embodied carbon in our designs while helping our clients achieve their own climate change initiatives. As part of our Integrated Design approach, we ask every team member, including our clients, to provide technical and operational input to fulfill the sustainability goals of the project.

To summarize our sustainable designs from the previous year and plans for the coming year, Clark Nexsen annually publicizes an Integrated Design Report and Action Plan, available on our website. www.clarknexsen.com/publications/

Declaration

We declare on project proposals that when we signed on to the SE 2050 Commitment in January 2021, we became an early supporter on a growing list of firms that are measuring the embodied carbon of structures and taking steps to minimize and eventually eliminate embodied carbon in all structural engineering projects by the year 2050. As part of this commitment, we annually update our Embodied Carbon Action Plan to document our actions to reduce embodied carbon in our projects. We also pledge to submit data to the SE 2050 project database, providing an opportunity for all structural engineers to collaborate and understand embodied carbon and to set attainable targets for future projects.

We make known to architects that SE 2050 aligns with other climate change initiatives, including the AIA 2030 Commitment, LEED, Green Globes, Envision, Living Building Challenge, and the COTE Top Ten awards. The work that we perform for structural sustainability can contribute toward the certification being sought and environmental goals of the project. For example, performing a Whole Building Life Cycle Assessment can help pursue LEED Zero and LEED v4.1 Materials and Resources Credit 1 (MRc1, Building Life Cycle Impact Reduction).

Together with our clients, we can meet the needs for our projects without breaking our planet’s ecological boundary and create examples for others.

ADVOCACY

Company Announcement

On February 2021, we proudly announced on our company news site, “Clark Nexsen Joins the SE 2050 Commitment to Reduce Embodied Carbon in Structural Systems.” www.clarknexsen.com/news/

Structural Materials

As part of our Sustainable Design Meeting agenda, we encourage our clients to require that:

- Structural materials come with Environmental Product Declarations.
- Structural materials are recycled or regional.
- All lumber is FSC-certified.
- Low-carbon concrete mixes are specified.
- Demolition and construction waste is minimized.
- A Whole Building Life Cycle Assessment is performed to consider the full impacts of a project's carbon footprint and compare against benchmark projects.

Client Education

Another agenda item in our Sustainable Design Meeting is a segment for “Client Education Opportunities.” We have found that many sustainability programs define “carbon neutrality” in terms of operational emissions. We educate our clients on why embodied carbon is at least as important as emissions, that embodied carbon is gaining increasing attention, and that the embodied carbon of all new components to create an energy efficient building may counteract the carbon neutrality sought. We review a list of specific measures that can be taken, including the importance of performing a Whole Building LCA, to quantify and reduce embodied carbon in the project.

Office Programs

As mentioned previously, the SE 2050 team at Clark Nexsen is part of our Embodied Carbon Research Group, which is a division of our broader Integrated Design effort. In-house SE 2050 team members share information with each other through regular live chats and work together to build a database of knowledge that is accessible to employees on our company intranet site. We give in-house presentations to our colleagues and work with our project managers on implementing sustainability practices into our projects.



www.clarknexsen.com