

Sustainability Action Plan

Foreword

Summer 2022

The Sixth Assessment Report by the [Intergovernmental Panel on Climate Change](#) suggests that we have not been aggressive enough to limit global warming to 1.5°C above pre-industrial levels. Our next target should be to limit warming to 2°C, but even this lower bar will still require significant changes in the status quo. At the time of this writing, heat waves, droughts, and intense storms are hitting many locations around the globe. They are more frequent, last longer, and are more dangerous, leading to various repercussions. If we wish to mitigate these and many more effects of climate change, everyone needs to chip in and do their part to live more sustainably. Especially architects.

About 40% of U.S. greenhouse gas emissions are directly related to the building industry. According to the [World Green Building Council](#), 11% of these emissions come from every building's embodied carbon, and 28% come from operational carbon. Embodied carbon is the carbon emissions associated with the creation of materials and a structure. Operational carbon is the carbon emissions associated with a building's energy use and maintenance over time. Architects are uniquely positioned with the opportunity to reduce these emissions through design while mitigating many other effects our built environment has on the natural world.

From energy to materials to water, our built environment has the potential to create a regenerative future if designed with the planet and people in mind. The practices of extracting natural resources for building products must be done in a manner that reduces strain on ecosystems and maintains natural habitats. Building and maintaining structures are typically associated with large amounts of waste. Most materials and scraps are usually unsuitable for reuse, recycling, or composting and end up in landfills. Many products are created using chemicals that are detrimental to the health of the manufacturer's employees, those who will inhabit the building, and eventually to bodies of water that we and other species rely heavily on. Buildings use a great deal of water, and many places like the American Southwest are realizing that water is a finite resource we should use more carefully. We as architects have the ability...the responsibility...to create a regenerative future through our designs. From material selections to energy and water usage, our buildings will showcase the solutions for the daunting reality of climate change.

As an example of what the architecture industry can accomplish, the non-profit organization Architecture 2030 developed the 2030 Challenge. Appropriately named, it calls for all buildings to be net zero by 2030 and all fossil fuel use to be phased out by 2040. Since the Challenge was issued in 2005, [data gathered from Architecture 2030 and the U.S. Energy Information Administration in 2019](#) shows that carbon emissions from the built environment have been reduced by 21%.

Continuing the momentum, the American Institute of Architects (AIA) created an accompanying program, the 2030 Commitment. The Commitment pushes architects to keep track of their sustainability goals and encourages them to strive for the standards of the 2030 Challenge. The program developed the Design Data Exchange (DDx) database to record project designs' predicted Energy Use Intensity (pEUI), as well as other metrics. [Information gathered from the database in 2020](#) shows that the architects that have signed on to the 2030 Commitment and registered their projects, on average, have reduced their designs' pEUI by 51.3% from industry baselines. This year, our firm has signed on to this commitment.

Here at CDA, we realize that change needs to happen, and we are setting forth the standards and actions we are willing and challenging ourselves to take. In 2022, we signed the AIA 2030 Commitment and began reporting project designs' predicted Energy Use Intensity (pEUI) and other metrics to the AIA's Design Data Exchange. We have dedicated one individual on our team, William Aldrich, to track this Sustainability Action Plan, the sustainable design within our studio, and publicly report on progress annually.

This sustainability action plan outlines CDA's goals for the first year after signing the 2030 Commitment, and our goals for 2025, continuing into 2030. It is broken into measures to take when designing the built environment and implementations we would like to visualize in our day-to-day operations. It will be revisited once again in 2025 to maintain its relevancy, to look back on our accomplishments, and to find where we need to continue improving.

Thank you for being a part of this journey with us toward a more sustainable future,



A handwritten signature in black ink that reads "William Aldrich".

William Aldrich, CPHC
Graduate Architect



A handwritten signature in black ink that reads "Chris Dawson".

Chris Dawson, AIA, LEED AP BD+C
Principal

Building Design 2022

When Specifying Materials

- Create a [BuildingGreen.com](https://www.buildinggreen.com) account to be used for general product guidance throughout our research process. This resource allows us to review all aspects of sustainability related to any product category.

In order to reduce **embodied carbon**

- Products manufactured closer to the project site will be favored.
- The use of Forest Stewardship Council (FSC) wood over steel and concrete will be encouraged.

In order to reduce **operational carbon**

- Materials should be considered low in maintenance, with long life spans.
- All applicable light fixtures should utilize Light Emitting Diodes (LEDs).
- Appliances with Energy Star certifications will be favored.

In consideration of **human health**

- Materials with low Volatile Organic Compound (VOC) content will be favored.
- The firm will become familiar with the International Living Future Institute's [Red List Chemicals](#).

To protect **nature and natural resources**

- New plantings must be considered native species relative to projects' locations.
- All applicable plumbing fixtures should have a WaterSense label, to reduce water usage.
- Forest Stewardship Council (FSC) Certification will be favored for all new wood, promoting sustainable tree harvesting practices.
 - Wood may also be salvaged or reclaimed.

When Designing

In order to reduce **embodied carbon**

- Encourage the use of existing buildings and minimize the disturbance of natural landscapes.
- Design every project to be beautiful, to enhance its desirability and encourage the building's long lifespan.

In order to reduce **operational carbon**

- Begin standardizing and practicing details with reduced thermal bridging.
- Pursue all electric systems in projects without existing fossil fuel connections.
 - Projects with fossil fuel connections should be prepared for electric systems in the future.
- Design at least 1 project with electric vehicle charging.
- Design at least 1 project with solar panels.

Begin to Measure and Track

- Report at least 1 project to the American Institute of Architect's (AIA) 2030 Design Data Exchange (DDx).
- Calculate and track the percentage of renovations vs new builds.
- Develop public sustainability graphics for at least 1 project.
- Set up at least 1 project to measure post-occupancy energy usage.

An environmental education center for a philanthropic Pennsylvania boarding school, conceptualized in early 2022, is a re-use of the existing center within an old milking barn. The designed renovation and addition includes the use of extra insulation, geothermal wells, solar hot water, and on-site renewable energy to reduce operational carbon. We also reduced embodied carbon by re-using the existing barn and specifying timber for the structure and cladding of the addition.



Building Design 2025+

When Specifying Materials

- Start product searches on [Declare](#) and [Cradle to Cradle](#) databases.

In order to reduce **operational carbon**

- U-factors for fenestrations shall be 0.30 or less (BTU/hr · ft² · °F).
- All applicable appliances will be Energy Star certified.

In consideration of **human health**

- Check products against the Red List database and favor those that are Red List free.
 - Those that are not Red List free, advocate for change with our template letter.
- Interior materials must emit no or low Volatile Organic Compounds (VOCs).
 - Materials that do emit VOCs must be certified under an applicable [California Department of Public Health \(CDPH\) Standard Method v1.2 program](#).

To protect **nature and natural resources**

- Encourage all paved surfaces to be permeable where applicable.

When Designing

- Design at least 1 project to Leadership in Energy and Environmental Design (LEED) Certification or National Green Building Standard with or without actual certification.

In order to reduce **operational carbon**

- All projects shall use electricity as their only energy source.
- We will target a 50% reduction in baseline Energy Use Intensity (EUI) for every project that EUI is measured.
- All applicable public buildings shall be designed with or prepared for electric vehicle charging and bicycles.
- Design at least 1 project to be net zero.
 - With potential certification under Living Building Challenge (LBC) Zero Energy or Zero Energy Ready Home.
- Design at least 1 project to a Passive House standard, with or without actual certification.

In consideration of **human health**

- Biophilic design strategies shall be integrated into every project.
- Design at least 1 project to the WELL Building Standard, with or without certification.

Begin to Measure and Track

- Measure Energy Use Intensity (EUI) on every project and report every project to the American Institute of Architect's (AIA) 2030 Design Data Exchange (DDx).
- Count and use strategies to reduce embodied carbon on every project over 10,000 square feet.
 - Utilize the [Carbon Avoided Retrofit Estimator](#) or similar carbon calculator.
- Monitor at least 1 project's post-occupancy air quality.
- Measure at least 1 project's post-occupancy water usage.



Our new office at 210 North 3rd Street, under design at the time of this writing, is a renovation of a historic structure in downtown Harrisburg that has been empty for years. We currently intend to utilize all electric, highly efficient systems throughout including heat pumps for heating, cooling, and hot water. We will bring the originally designed light wells back to life and integrate daylighting controls to evenly light the spaces with little energy usage.

Firm Operations 2022

Begin to Implement

In order to reduce **operational carbon**

- Use a reduced number of vehicles, public transit, or electrified vehicles when traveling as a group.
- Reduce individual employee traveling by utilizing a hybrid of in-office and remote work.
- Purchase office supplies made and distributed locally when possible.

To reduce **consumption and waste**

- All easily recyclable items will be recycled.

To continue building **awareness and leadership**

- Sustainable project features will be emphasized in project descriptions.
- Each employee will attend at least six sustainably oriented Continuing Education Units (CEUs) per year.
- The firm will have at least two sustainably registered professionals.

Begin to Record and Improve

In order to reduce **operational carbon**

- Measure the size of our digital file storage.

To reduce **consumption and waste**

- Track the amount of paper used.

To continue building **awareness and leadership**

- Record the amount of sustainable Continuing Education Units (CEUs) attended by our employees.

Our current office, Suite 701 at the Commerce Tower in Harrisburg, can boast some sustainable features by nature of good design. Being downtown gives us access to a variety of transportation options and encourages walking. The open studio design and exposed structure minimize construction while maximizing natural character, collaboration and daylighting. Occupancy sensors throughout reduce lighting and mechanical loads.



Firm Operations 2025+

Begin to Implement

In order to reduce **operational carbon**

- Optimize digital file storage systems to reduce their size.

To reduce **consumption and waste**

- Develop strategies to use 20% less paper, or better.

To continue building **awareness and leadership**

- Include and advocate sustainability features in proposals.
- Credit 30% or more of the firm with sustainability credentials by 2030.
 - Leadership in Energy and Environmental Design Accredited Professional (LEEDap) or Green Associate
 - Living Future
 - Passive House
 - WELL
- Create a [Just Label](#) from the International Living Future Institute by 2030.

Begin to Record and Improve

In order to reduce **operational carbon**

- Track our electricity usage across various aspects.

To reduce **consumption and waste**

- Become conscious of items that are sent to a landfill.
 - Find reusable replacements where applicable.

To advocate for **employee health**

- Monitor the air quality within the workspace.

Our Philosophy

At CDA, designing a more sustainably built world starts with designing beautiful places. Beauty is what makes a building well-loved, well-maintained, and long-lasting. Designing buildings that people love and cherish is fundamentally an act of sustainable design. We strive for it every day.

Practicing predominantly in the Northeast, where we have a rich, historic building stock, we believe that reusing existing structures and infusing them with new life is one of the most sustainable design acts one can undertake. Exploring the dialog between contemporary architecture and historic buildings has long been a thread in our work – in fact, at the time of publishing this plan, nearly 85% of CDA projects are renovations to existing buildings.

We are honored to join 1,100+ firms in committing to striving for carbon neutrality by 2030 and to dedicate our time to measure, track and deliver on green building pillars, no matter the project.



Chris Dawson Architect

+1-717-805-5090

chris@chrisdawsonarchitect.com

chrisdawsonarchitect.com