

Climate Change Impacts on and Actions from the Construction Industry: Past,  
Present and Future

Author : Alec Kalogeropoulos

Faculty Advisor: Dr. Amine Ghanem



## *Climate Change Policies Effect on the Construction Industry*

In the movement towards reduced emissions and sustainability, climate change policies have and will continue to influence actions taken in the construction industry. These policies can be seen on the local, national, and international level.

On the local level, ordinances have been put in place that require green certifications for public buildings, ban the use of certain building materials, and incentivize tax credits. Since the early 2000's, major cities around the United States have begun requiring public buildings to achieve various levels of LEED certification or face fines. A prime example of this is the city of Washington, DC, which beginning in 2012, required "that public schools shall aspire to meet LEED for Schools at the Gold level or higher" or face "fines on private commercial buildings that do not provide proof that the project is LEED certifiable within 2 years of receipt of occupancy." (LEED Legislation by City: See *Where LEED Certification Is Required*, 2015) In my home state of Massachusetts, many local communities have fought the attorney general over banning the implementation of fossil fuel infrastructure in new buildings and renovations. In 2019, the town of Brookline, MA "by an overwhelming majority," passed a bylaw prohibiting fossil fuel infrastructure in new construction or gut renovations. It was the first such municipal measure passed outside of California. Inspired by the idea, other towns began preparing similar measures" (Shemkus, 2021). This was all in the effort to meet Massachusetts' goal of becoming carbon neutral by the year 2050. The bylaw was ultimately reversed by Massachusetts Attorney General Maura Healey, who deemed that it was unlawful for municipalities to supersede state building codes. (Shemkus, 2021).



### *Actions from the Construction Industry*

Within the construction industry, much has been done in recent years by companies large and small in an effort to reduce emissions. These efforts include the transition to electric equipment and vehicles, selection of renewable materials, and value engineering of sustainable alternatives.

Similar to the move of passenger vehicles towards electric and hybrid, the construction industry is also seeing a movement towards adopting electric equipment. One of the companies at the forefront of implementing green initiatives has been the Swedish-based construction company, Skanska. Specifically, Skanska's new EV First initiative, the company will no longer offer pure petrol or diesel vehicles as a benefit to eligible employees. Instead, fully electric vehicles (EVs) will be the preferred option, with petrol-electric hybrids (PHEVs) as an alternative, if more practical for the individual" (Sketchley, 2020). But the electric vehicle moment is not limited to just cars and trucks, as equipment ranging from site lights to excavators have also begun to go all electric. One of the most common applications of electric equipment has been in the use of portable solar site light stations. Primarily used for night work on heavy civil projects, solar light stations are a renewable source of light which provide many benefits over the traditional gas or diesel

Additionally, heavy equipment companies such as Komatsu and Caterpillar have also invested in electric technology. In 2017, Komatsu unveiled a massive electric dump truck called the eDumper, which featured a gigantic 600Wh battery pack. Caterpillar has also invested in Fisker, which is developing solid state batteries designed to outperform the lithium ion batteries used in all current electric vehicles” (Edelstein, n.d.).

On the topic of materials in the construction industry, a lot of efforts have been implemented to encourage renewable materials, and materials manufactured locally. Not only does the sourcing of local materials reduce emissions because of shipping, but also greatly benefits local businesses. Currently,

One of the other major actions of the construction industry has been the increase in value engineering services from the contractor to promote more alternatives. The construction industry is starting to move away from the traditional design-bid-







The main area that AGC could have the most impact on combating climate change in the construction industry comes from their reach and ability to educate. With the outreach that AGC has, their main tool could be to educate their members and member companies on new techniques and technologies. This could be in the form of promoting the use of electric equipment, incorporating more sustainable means and methods, recycling and adoption of more sustainable materials, etc.

Overall, AGC has the opportunity to make a significant contribution in the movement towards reduced emissions and creating a more sustainable construction industry. The construction industry has come a long way from past with the adoption of more sustainable construction materials, equipment, and methods, but there is still a long way to go. If the United States and the world is able to meet many goals of reaching net zero by 2050 and staying below the benchmark of 2 °C of warming, the construction industry has to be a leader in that effort. AGC, with its long history and wide span of influence in the construction industry is in the right position to be able to make change happen.

## Bibliography

CLT Construction: A Modern Building Material | WIGO Group. (n.d.). Wigo.info. Retrieved November 10, 2022, from <https://wigo.info/construction/>

*Edelstein, S. (n.d.). This Electric Caterpillar Excavator Is the Tesla of Heavy Construction Equipment. The Drive. <https://www.thedrive.com/tech/26234/this-electric-caterpillar-excavator-is-the-tesla-of-heavy-construction-equipment>*

*kwright@dbia.org. (2021, September 27). New Research Shows Design-Build Growth Continues Despite Market Challenges. DBIA. <https://dbia.org/new-research-shows-design-build-growth-continues-despite-market-challenges/>*

*LEED Legislation by City: See Where LEED Certification is Required. (2015, June 18). Everblue Training. <https://everbluetraining.com/cities-requiring-or-supporting-leed-2015-edition/>*

Neill, P. (2020, December 16). Construction industry accounts for 38% of CO2 emissions. Environment Journal. <https://environmentjournal.online/articles/emissions-from-the-construction-industry-reach-highest-levels/>

Ritchie, H., & Roser, M. (2020). Emissions by sector. Our World in Data. <https://ourworldindata.org/emissions-by-sector>

Shemkus, S. (2021, July 15). *Massachusetts cities try new legal path toward banning new fossil fuel hookups.* Energy News Network.

<https://energynews.us/2021/07/15/massachusetts-try-new-legal-path-toward-banning-new-fossil-fuel-hookups/>

Sizirici, B., Fseha, Y., Cho, C. S., Yildiz, I., & Byon, Y. J. (2021). A Review of Carbon Footprint Reduction in Construction Industry, from Design to Operation. *Materials* (Basel, Switzerland), 14(20), 6094. <https://doi.org/10.3390/ma14206094>

Sketchley, E. (2020, November 26). *Skanska puts electric vehicle policy into action*. Planning, BIM & Construction Today. <https://www.pbctoday.co.uk/news/energy-news/electric-vehicle-policy/85874/>

SOLAR CONSTRUCTION SITE LIGHTING | CONSTRUCTION WORK. (n.d). LUXMAN. <https://www.luxmanlight.com/solar-construction-site-lighting/>

The Editors of Encyclopaedia Britannica. (2019). Paris Agreement | Summary & Facts. In *Encyclopædia Britannica*. <https://www.britannica.com/topic/Paris-Agreement-2015>

The White House. (2022, August 19). *FACT SHEET: The Inflation Reduction Act Supports Workers and Families*. The White House.

<https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/19/fact-sheet-the-inflation-reduction-act-supports-workers-and-families/>

*What the Inflation Reduction Act does for green energy*. (2022, August 11). PBS NewsHour. <https://www.pbs.org/newshour/science/what-the-inflation-reduction-act-does-for-green-energy>