CONCRETE MASONRY IS MORE SUSTAINABLE THAN OTHER TYPES OF CONCRETE

UNIQUE STRUCTURE:
CMU are made with dry-cast concrete, using less water and cement than other concrete products. This reduces cement content and translates to lower embodied carbon.

DRY-CAST CONCRETE:
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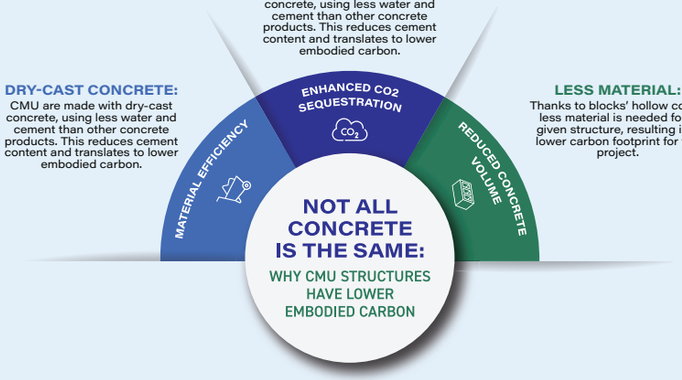
LESS MATERIAL:
Thanks to blocks' hollow cores, less material is needed for a given structure, resulting in a lower carbon footprint for the project.

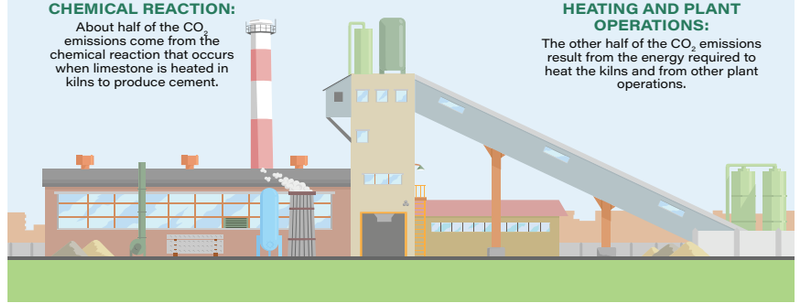


CEMENT PRODUCTION CO_2 IMPACTS

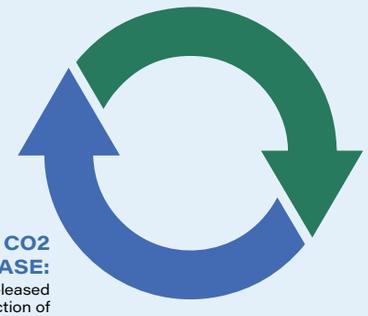
The majority (75-90%) of the embodied carbon in CMU is due to the cement. During cement production, CO_2 is released in two main ways:

CHEMICAL REACTION:
About half of the CO_2 emissions come from the chemical reaction that occurs when limestone is heated in kilns to produce cement.

HEATING AND PLANT OPERATIONS:
The other half of the CO_2 emissions result from the energy required to heat the kilns and from other plant operations.



CARBON CYCLE OF CONCRETE



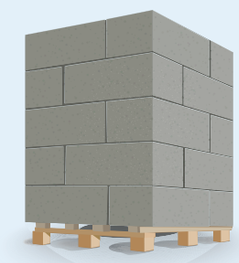
CO2 REABSORPTION:
Once concrete is made and exposed to air, it begins to reabsorb CO2, sequestering it over time and permanently locking it away.

INITIAL CO2 RELEASE:
CO2 is initially released during the production of cement from limestone.

CARBONATION RATES:

DRY-CAST **VS** WET-CAST

Dry-cast concrete products, such as CMU, have an interconnected void structure that enables them to sequester CO_2 more effectively than wet-cast concrete. This structure, combined with the thinner elements of CMU like face shells and webs, allows for increased CO_2 absorption at faster rates.



RESEARCH FINDINGS

SEQUESTRATION POTENTIAL:
Research indicates that, before they are installed, CMU can sequester about 21% of potential CO_2 that was released due to the chemical reaction during cement production. This figure increases to 49% within the first two years of building use.

VS

TOTAL EMBODIED CARBON:
Considering the total embodied carbon of CMU production, including raw materials, plant operations, and emissions from the chemical reaction and heating during cement production, CMU sequester approximately 8% of their embodied carbon at 28 days (gate) and around 18% after two years of use.

LONG-TERM IMPLICATIONS

Even beyond the initial two years, CMU continue to absorb CO_2 from the atmosphere. Models suggest that up to 25% of the total embodied carbon of CMU could be absorbed within the first 20 to 25 years of a building's lifetime.

25%
OF TOTAL EMBODIED CARBON OF CMU

FUTURE RESEARCH

Ongoing studies aim to further quantify and understand how different concrete products can contribute to CO_2 sequestration, reinforcing their reputation as sustainable building materials.

For more information, visit the ***Concrete Masonry & Hardscapes Association's Website.***

CMHA CONCRETE MASONRY & HARDSCAPES ASSOCIATION