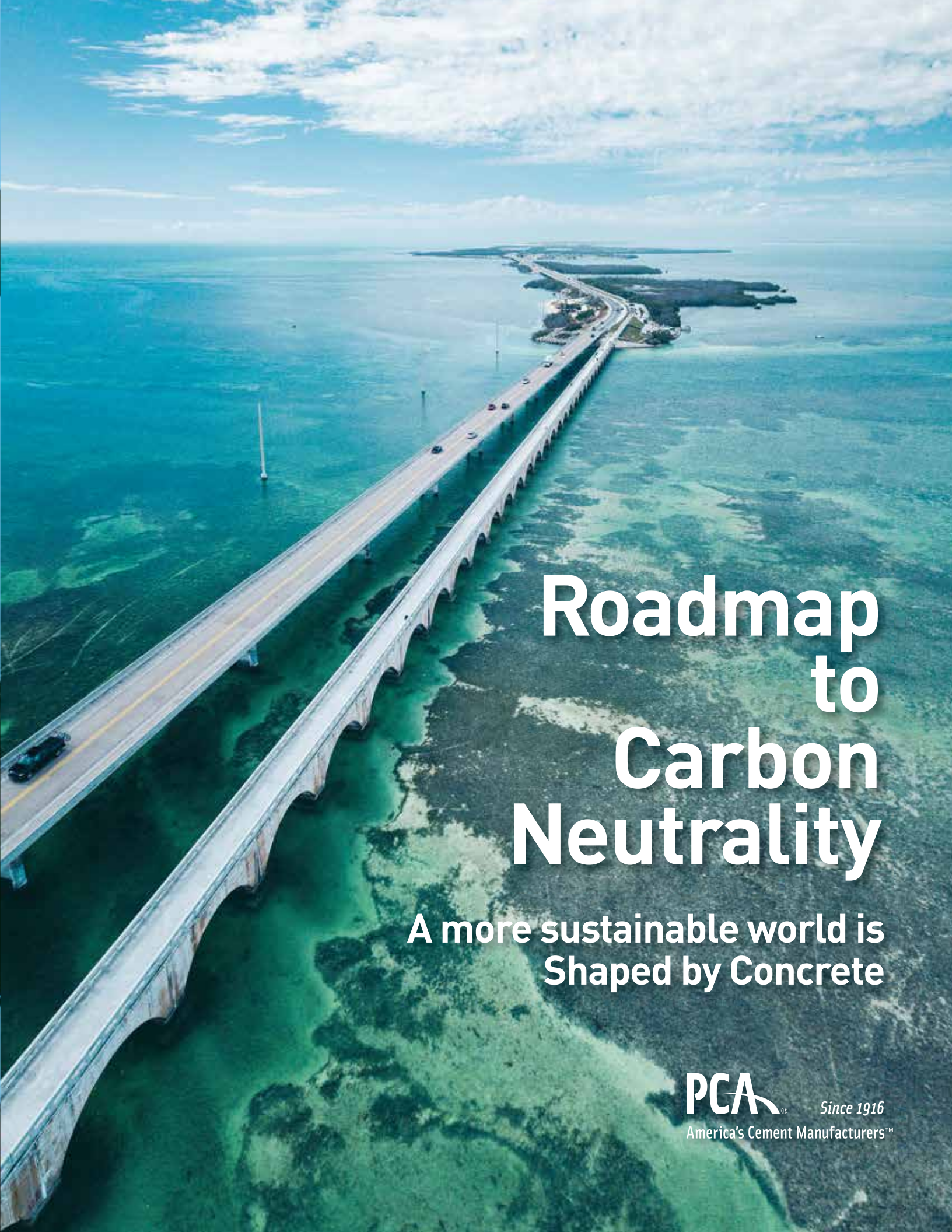

Roadmap to Carbon Neutrality

A more sustainable world is Shaped by Concrete

PCA® *Since 1916*

America's Cement Manufacturers™

In late 2020, the Portland Cement Association (PCA) released a climate ambition statement: PCA and its members will develop a roadmap by the end of 2021 to facilitate member companies achieving carbon neutrality across the concrete value chain by 2050. This is not just our statement; it's our commitment. It's what we as America's cement manufacturers stand behind.

"Cement and concrete have been pivotal in building resilient communities that enable people to live safe, productive and healthy lives via structures that withstand natural and man-made disasters. Our members are committed to delivering products that meet those needs as well as drive down emissions and achieve the industry's environmental goals."

– MIKE IRELAND, President and CEO, Portland Cement Association

The entire value chain of clinker, cement, concrete, construction, and carbonation (concrete as a carbon sink) is an integral part of tomorrow's circular economy and each link has its own part to play in the roadmap.

Clinker:

Clinker is the first link in the value chain that cascades into cement, concrete, construction, and using concrete as a carbon sink. The production of clinker starts with quarried materials like limestone, clay, shale, and sand. Optimizing clinker composition and how clinker is manufactured is the starting point for the roadmap to carbon neutrality.

Cement:

Portland cement is the glue that holds everything together; without it there is no concrete. And while clinker and gypsum are integral components of cement, they do not have to be the only components. Today's cements already include finely ground limestone, inorganic processing additions, and precisely controlled amounts of sulfate. Tomorrow's cements are poised to take even greater advantage of those materials. Optimizing the ingredients in cements not only enhances the benefits of cement-based products, but they also reduce their carbon intensity.

Concrete:

When contractors first started mixing concrete, they kept it as simple as 1-2-3: one part cement, two parts sand, and three parts gravel. It was crude but efficient. Today's concrete is far more complex. There are three major cement specifications alone with a variety of subcategories within each. Add to that dozens of admixtures and a potentially limitless number of aggregate gradations possible and you have an almost infinite number of concrete mixture combinations that all help reduce overall emissions.

Construction:

Whether it is houses and hotels or roads and bridges, sustainable and resilient construction is what gives us the built environment. What we commonly consider construction involves four separate phases: design, construction, use, and end-of-life. We can reduce the carbon intensity of construction through optimization within each of these phases.

Carbonation:

Concrete absorbs CO2 over its entire life and captures it permanently in a process called carbonation. The carbonation process takes CO2 and an alkaline reactant to form calcium or magnesium carbonates. That is why our roadmap uses the term 'concrete as a carbon sink'. In the case of concrete, the alkaline material is the portland cement, so carbonation occurs naturally.

Carbon Neutrality by 2050

Behind the value chain is an industry that drives engineers, architects, contractors, builders, operators, and consumers; those groups represent more than six percent of the American gross domestic product. The cement and concrete industry is actively engaged with government, academia, entrepreneurs, scientists, and researchers, driving society to carbon neutrality by 2050.

To learn more about the industry's commitment to sustainability visit cement.org/sustainability.

shaped BY CONCRETE

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