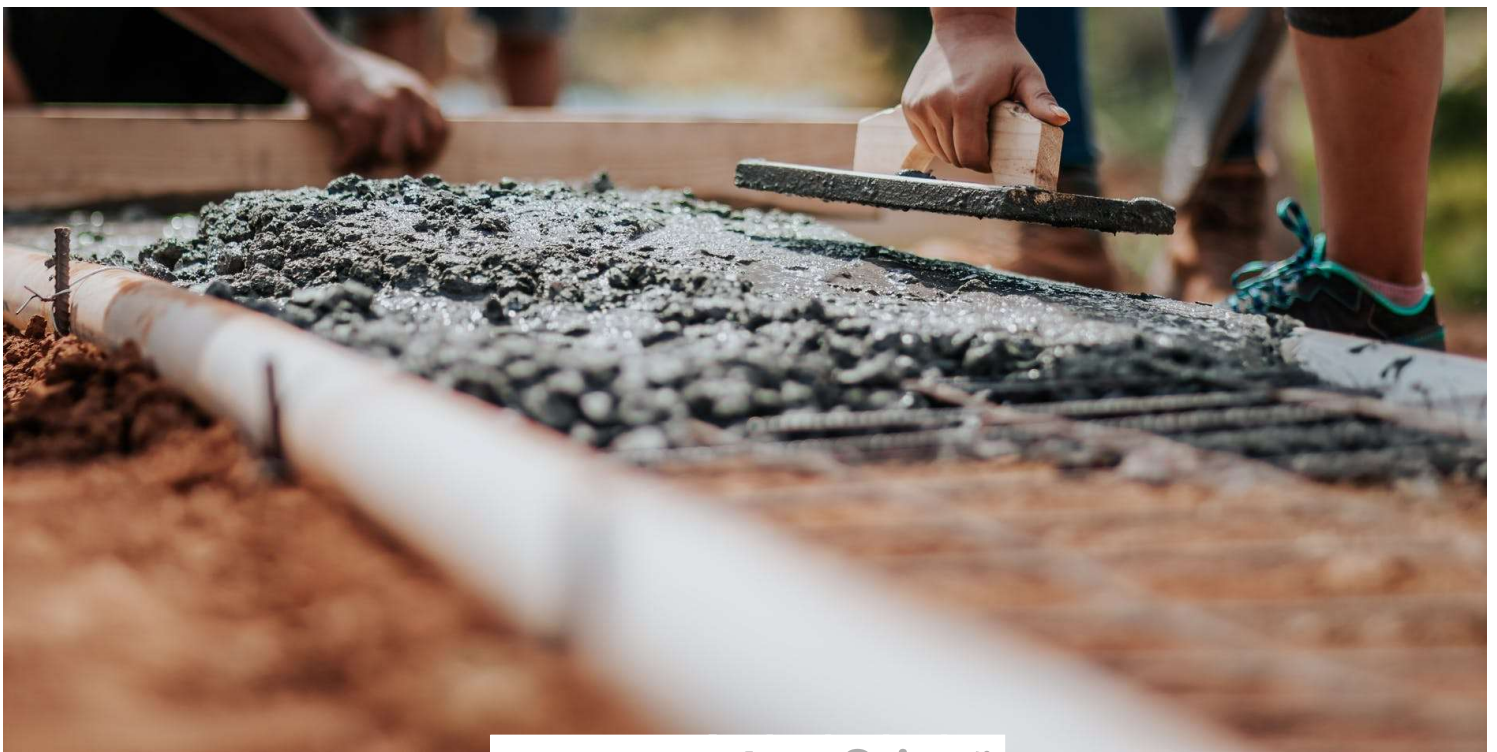


MARCH 10

A first look at US cement manufacturers' road map to carbon neutrality

Michelle Lewis - Mar. 10th 2021 1:01 pm PT

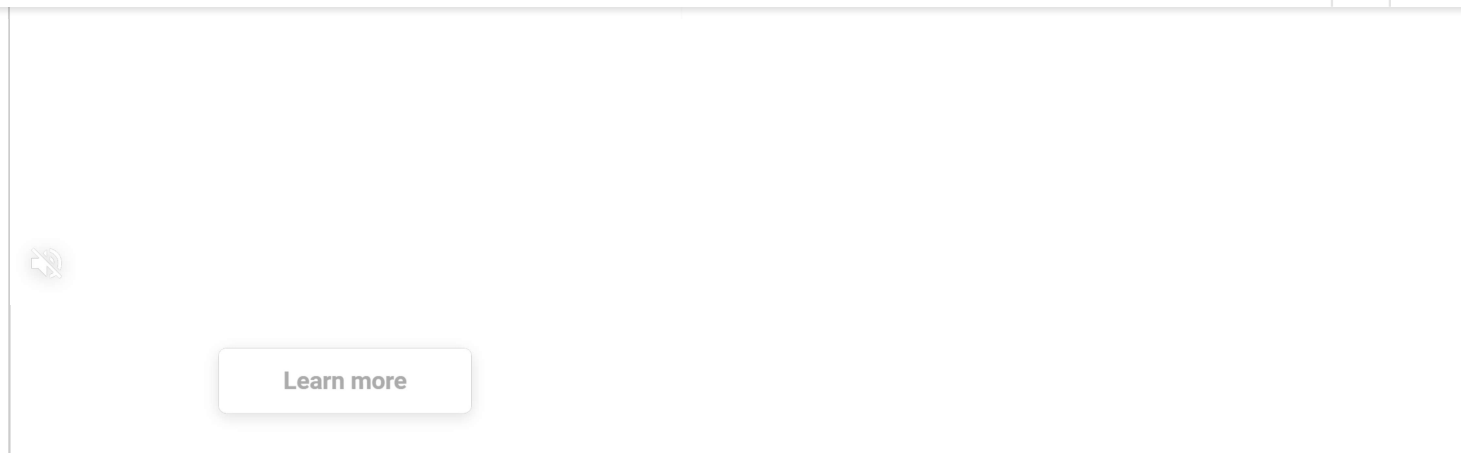


24 Comments



Electrek spoke with Rick Bohan, VP of sustainability at the Portland Cement Association (PCA). The Portland Cement Association represents 92% of US cement manufacturing production capacity and has distribution facilities in every continental US state. Cement is the second-most-used construction material on the planet.

In November 2020, PCA announced an industry-wide ambition to develop a road map by the end of 2021 to help its member companies achieve carbon neutrality across the concrete value chain by 2050.



Cement is the key ingredient in concrete, so the forthcoming road map addresses not just cement, but concrete, too. Urgent action is necessary so cement and concrete can continue to play a critical role in the US's infrastructure future without making emissions worse.

***Electrek:* What are some examples of steps that PCA's road map will likely include to achieve carbon neutrality across the concrete value chain by 2050?**

Rick Bohan: The road map being developed by PCA on behalf of the cement industry will include the full concrete value chain – from the production of cement through the use of concrete across the nation. A few examples of the actions included in the road map are:

Increasing access to alternative fuels, especially materials that otherwise end up in landfills, for cement plants to use;

Rapidly driving the adoption of innovative products like Portland limestone cements (PLC), performance-based concrete mixtures, blended cements and more;

Investing in carbon capture, utilization, and storage (CCUS) technology and critical infrastructure to support CCUS, including a robust and smart electric grid.

***Electrek:* Could you describe how those examples will work in real terms?**

Rick Bohan: Increasing access to alternative fuels, especially materials that otherwise end up in landfills, for industry can have a dramatic and immediate impact. Currently, many cement plants are reliant on non-renewable resources to power plants, but that could be mitigated by increasing access to alternative fuel sources. Through this increased access, alternative fuels including fly ash, carpet remnants, tires, and other non-hazardous materials are not only helping to reduce emissions, but also diverting materials that would be otherwise sent to a landfill.

Cement kilns are extremely efficient at combusting any fuel given their extremely high operating temperature, and they can maintain emissions at or below the levels from more traditional fossil fuels.

Top-Rated Concrete Contractors

Find the best pros for the job at [Angi](#) / enter your Zip!

Angi

Vis

In order for non-hazardous waste to be rerouted from landfills to industries such as cement to use for fuel, we'll need regulatory reform and the recognition from policymakers that the increased use of alternative fuels is consistent with meeting mid-century climate goals. Today, alternative fuels make up only about 15% of the fuel used by domestic manufacturers, compared to more than 36% in the European Union, including as high as 60% in Germany.

US cement plants began adopting alternative fuels as early as the 1970s, but today these fuels only make up about 15% of the fuel used by domestic cement manufacturers due to outdated/burdensome regulations. It's really unfortunate, because there's almost a regulatory disincentive against beneficial use of alternative fuels.

Portland limestone cement offers the same durability and resiliency benefits of any other Portland cement, while reducing embodied CO2 by 10%. By optimizing the amount of [clinker](#) in cement to incorporate more limestone, we can reduce the amount of energy (and associated emissions) used to heat clinker (the main ingredient in cement) and ultimately produce cement.

PLC isn't as widely used as it could be, and barriers for broad uptake seem to be just a case of institutional inertia. People tend to stick with what they know, but in this case, doing so misses a great opportunity.

By shifting to PLC, manufacturers have already reduced CO2 emissions by more than 325,000 metric tons in the US from 2012-2018, equivalent to carbon stored in over 400,000 acres of forest. 32 state Departments of Transportation currently allow the use of PLC, yet until recently, PLC was still less than 1% of total cement shipments.

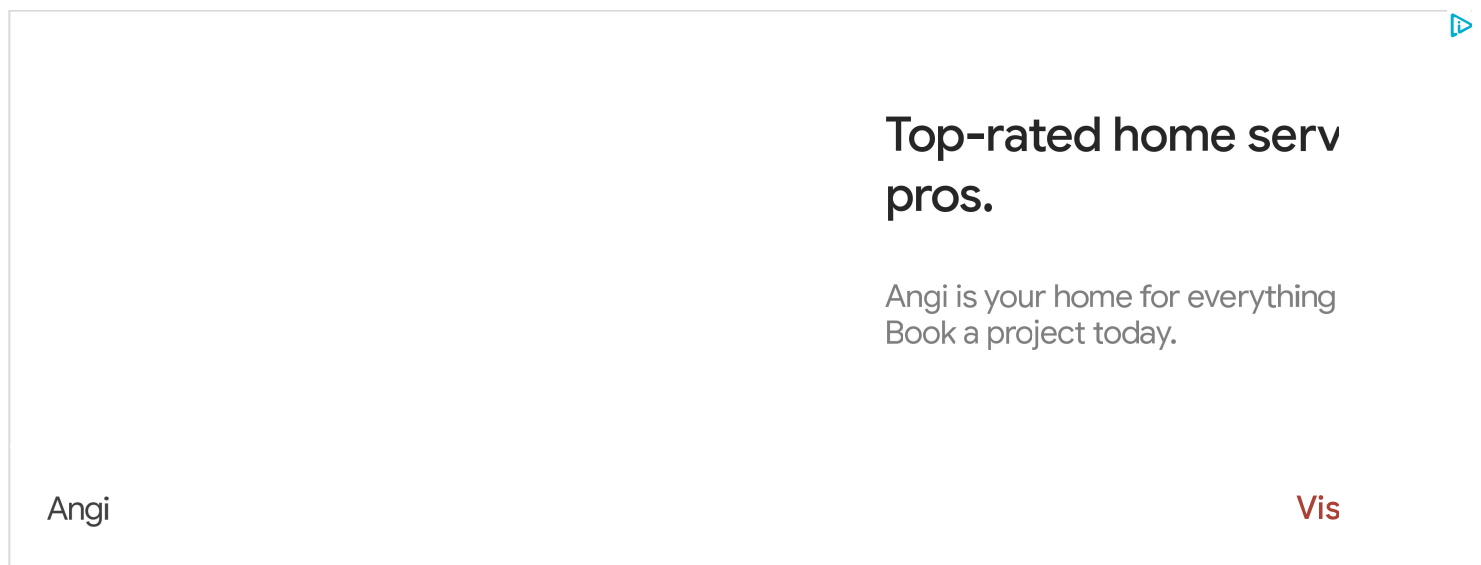
Carbon capture, utilization and storage-related technologies and innovations will not only be groundbreaking for the industry but also essential. There's a unique opportunity with concrete to actually use captured carbon in the concrete-curing process, helping to harden and strengthen the concrete more quickly.

The CO2 can be injected into fresh concrete and is actually permanently sequestered in the concrete, so even if a structure is demolished in the future, the CO2 is not released.

Electrek: Are there any new innovations that PCA sees as being potentially groundbreaking for the industry to reduce emissions?

Rick Bohan: The technology for carbon capture is still in early stages, and hasn't been developed to scale. Truly continuing to see innovation here is going to be groundbreaking for the industry.

Cement manufacturing is an energy-intensive process that depends on carefully balanced chemistry and physics. Cement plants run continuously, typically 24 hours a day, seven days a week, and generating and maintaining kilns at the high temperatures required to create clinker involves the combustion of significant quantities of fossil or alternative fuels. The chemical process to convert limestone and other ingredients into clinker is also emissions-intensive, typically generating 50% to 60% of the CO₂ from manufacturing.



The image shows a screenshot of an advertisement for Angi. The text reads: "Top-rated home serv pros." followed by "Angi is your home for everything Book a project today." The Angi logo is visible in the bottom left corner, and the word "Vis" is in the bottom right corner. A small blue play button icon is in the top right corner of the screenshot area.

US cement manufacturers have invested billions of dollars in technologies in increasing energy efficiency and reducing carbon emissions, but energy efficiency alone will not be enough to meet long-term reduction goals.

As mentioned, over 60% of the cement industry's carbon emissions result from the chemical conversion of limestone and other ingredients into cement – there is no way to prevent the generation of CO₂ during this process – it is a “chemical fact of life.”

Any long-term carbon reduction strategy for the cement manufacturing industry will require significant advances in CCUS technologies with a particular focus on research, development, and cost-effective deployment.

While promising CCUS technologies are under development domestically and overseas, none have reached the commercial stage of deployment.

Those technologies include traditional solvents, sorbents, and membranes, as well as unique technologies like algae capture, direct separation reactors, and oxyfuel calcination. Nearly all research and federal

Electrek: How would a more robust and smarter electric grid help the cement industry meet your goal of carbon neutrality by 2050?

Rick Bohan: We're an energy-intensive, trade-exposed industry, and much of our electricity is consumed in crushing and grinding. It's likely that plants will use technologies like waste heat reduction to generate onsite electricity, and we know that renewable energy will increasingly be a part of the cement plant energy mix. Both of those need a grid to deliver and to accept renewable energy, and that means a grid that's reliable and robust.



Rick Bohan is vice president, sustainability for the Portland Cement Association. He is responsible for coordinating all of PCA's sustainability-related activities including its ongoing development of a road map to carbon neutrality. He was previously senior director of research and technology at PCA. Rick is an editor and author of the second edition of PCA's 2-volume book, Innovations in Portland Cement Manufacturing, along with many other publications. His career with PCA spans 27 years in virtually every aspect of cement and concrete technology and applications. Before his tenure at PCA, Rick worked in consulting engineering and served on active duty as both an enlisted Marine and a commissioned Marine officer. He holds a BS in civil engineering, an MBA, and is a registered professional engineer.

Photo: Rodolfo Quirós/[Pexels.com](https://www.pexels.com)

FTC: We use income earning auto affiliate links. [More](#).

You're reading Electrek—experts who break news about [Tesla](#), [electric vehicles](#), and [green energy](#), day after day. Be sure to check out our [homepage](#) for all the latest news, and follow Electrek on [Twitter](#), [Facebook](#), and [LinkedIn](#) to stay in the loop. Don't know where to start? Check out our [YouTube channel](#) for the latest reviews.

Subscribe to [Electrek on YouTube](#) for exclusive videos and subscribe to the [podcast](#).



Guides

[Green Energy](#)

[carbon emission](#)

About the Author

Michelle Lewis

Michelle Lewis is a writer and editor on Electrek and an editor on DroneDJ, 9to5Mac, and 9to5Google. She lives in St. Petersburg, Florida. She has previously worked for Fast Company, the Guardian, News Deeply, Time, and others. Message Michelle on Twitter or at michelle@9to5mac.com. Check out her personal blog.

NordVPN

Because I don't want to wait for the best of British TV.

MacBook Air

Light, durable, quick: I'll never go back.

Tesla Vision active safety features as good as radar

142 Tesla Megapacks replace California gas peaker plant

Honda's 'Pro' to US in 2021

Comments for this thread are now closed



Comments

Community

Privacy Policy

Login

Recommend

Tweet

Share

Sort by Best

idjler • 4 months ago • edited

That was marketing buzzword-bingo greenwashing drivel and misdirection. They have no plans and no visions - this is business as usual with a shiny veneer.

Why wasn't he talking at shifting to wood alternatives, bio-cement, self-healing, and low-temperature production - it was all dismissed with "prohibitively expensive" which is another

to fix it - someone else has that problem.

This planet has been sequestering carbon into limestone in the sea-beds for billions of years and these guys just want to undo all of that.

10 ^ | v 1 • Share ›

NQNQ → idjler • 4 months ago • edited

Yes, this part bothered me quite a bit:

US cement plants began adopting alternative fuels as early as the 1970s, but today these fuels only make up about 15% of the fuel used by domestic cement manufacturers due to outdated/burdensome regulations.

In corporate speak, "outdated regulations" generally means "we want to pollute more". But hey, if they can prove that burning old tires can pollute less than fossil fuels, then I'm open to seeing the studies. But I'm extremely skeptical.

2 ^ | v • Share ›

R Langley → NQNQ • 4 months ago

That part bothers me too. It reminds me of the BIO Fuel green washing where offcuts etc from the forestry industry would be used to produce electricity...now entire forests are ground up to produce pellets and shipped halfway around the world....and subsidized because it's "green".

1 ^ | v • Share ›

80 degrees.. → idjler • 4 months ago • edited

I disagree. I found it informative. For example 50% of the emissions are created in the chemical process and the proposed solution is carbon capture/ sequestration in the final concrete. Works for me, what's wrong with that? Why is it so unbelievable that the laws tend to incentivize fossil fuels when they were written during the peak of fossil fuel corporate lobbying power?

I am curious about low-temp alternatives though :)

1 ^ | v • Share ›

just a bunch of bs so the board is happy and no one divests.

2 ^ | v • Share ›

Jan Tjarks • 4 months ago

What about gravel and sand neutrality?

1 ^ | v • Share ›

RockySoil1 • 4 months ago

Wow, just wow. Let me summarize: The problem is burdensome regulation, so we are going to support Republican politicians who cut regulation but deny climate change.

If they really cared about carbon emissions, they'd be supporting solar, wind, etc. for the grid, not "we want to burn more trash". Electrek should call them out for blowing smoke up our...

1 ^ | v 1 • Share ›

Bruce Thompson → RockySoil1 • 4 months ago

"If they really cared about carbon emissions, they'd be supporting solar, wind, etc. for the grid,..."

What has that to do with reducing CO2 emissions from the cement manufacturing process?

1 ^ | v • Share ›

Mycroft-at-Luna → Bruce Thompson
• 4 months ago

Maybe they could use solar and wind to produce green hydrogen which could then fire their kilns?

1 ^ | v • Share ›

Michelle Lewis Electrek Staff → RockySoil1
• 4 months ago

They do - last question: "we know that renewable energy will increasingly be a part of the cement plant energy mix. Both of those need a grid to deliver and to accept renewable energy, and that means a grid that's reliable and robust."

^ | v • Share ›

MorinMoss → Michelle Lewis • 4 months ago

Translation: We're not going to do a damn thing to change our energy usage.

1 ^ | v • Share ›

R Langley → Michelle Lewis • 4 months ago

There was nothing in his comment that suggested that the cement industry is participating in the transition to renewable energy. The use of hydrogen to generate the high temps they need would be a true step in the Green direction if it's green hydrogen...it would appear to be one of the only real ways that this industry could lower their emissions. Carbon Capture is not a real solution at this point. Burning anything but hydrogen is just adding to the problem.

^ | v • Share ›

Mitt Zombie • 4 months ago

How are those 10 cent Tesla bricks working out for Elon?

1 ^ | v 2 • Share ›

Muskotályos Előd 444 menekült • 4 months ago

Hemp is a good building material! Cement will never be sustainable.

^ | v • Share ›

CroatiaTesla • 4 months ago

Where is electrek take? How is burning rubber good for climate?

^ | v • Share ›

Chris • 4 months ago

"Cement is the second-most-used construction material on the planet."

I think you mean concrete.

^ | v • Share ›

Rye an • 4 months ago

Good to see that there is, apparently, plenty of time .

^ | v • Share ›

MorinMoss • 4 months ago • edited

By the time they go carbon neutral, we who stay behind on Earth will be at war with Mars Colony to keep control of the

"As mentioned, over 60% of the cement industry's carbon emissions result from the chemical conversion of limestone

 Powered by WordPress.com VIP

☺