



Respect for mechanical insulation: Point-source carbon capture

Ever since she was crowned “The Queen of Soul,” no one has come close to Aretha Franklin in contesting the title. Her epic song, “Respect,” was written and originally released by Otis Redding. The tune was hugely responsible for making certain phrases popular in the U.S. The line “Take care, TCB” from the song’s chorus popularized the phrase “taking care of business” in the late 1960s.

Mechanical insulation has a long way to go to rightly earn the “respect” it deserves in our country’s drive to achieve net-zero emissions by 2050, but it does what it needs to day after day. It is like that quiet, unassuming person who remains out of the spotlight, yet is dependable and effective. In an assessment of the maturity of the technology, mechanical insulation would have a technology readiness level (TRL) of nine — the highest TRL — as an actual system already proven in operational environments.

The Intergovernmental Panel on Climate Change released a report, which stated we need to reduce new CO₂ emissions, while at the same time removing billions of metric tons of CO₂ per year to meet the global warming goal of 2.7 degrees Fahrenheit by

the early 2050s. Our industry believes that unassuming mechanical insulation could play a big role in enabling us to reach the climate goals — if our technology just got more “respect.” How is that? Let’s start with some basics on CO₂ emissions-reduction technology (aside from obvious nontechnology efforts like planting trees or reducing miles driven).

Mitigating CO₂ emissions technology falls into two buckets under the umbrella known as carbon capture, utilization and storage (CCUS) technology: reduce carbon at the source or reduce existing carbon already present in the atmosphere. Point-source carbon capture stops the CO₂ emissions from adding new carbon emissions. Carbon removal technology pulls CO₂ already in the atmosphere out of the air.

One of the technologies to remove existing carbon from the air is direct air capture (DAC). The recently passed infrastructure law includes \$3.5 billion to build four DAC hubs in the U.S. Each DAC installation has the goal of removing 1.1 million metric tons of CO₂ per year. The DOE will work with companies to develop and refine the technologies by which they will remove

the CO₂ and scale it quickly to make it cost-effective. Once the CO₂ is removed, it must be stored permanently. The Orca plant in Iceland, the world’s largest operational system for carbon capture and storage, has been up and running since September 2021.

The other technology — point-source carbon capture — must happen at the site of the generating plant or area that is creating the CO₂. This technology also requires the captured CO₂ to be transported to wherever it will be permanently stored or used/converted in another process — meaning trucks, pipelines or trains — if the unit is not situated at the site of the generated CO₂. Injecting captured CO₂ underground is a permanent carbon-removal solution. Late last year, the DOE awarded \$45 million for 12 projects to advance point-source technologies.

Mechanical insulation needs to earn the respect it deserves as a point-source carbon-capture product. Amidst all the wonderful technology being developed around the world to remove existing CO₂ or minimize new CO₂, mechanical insulation already lessens CO₂ from being generated in the first place; and it is proven, cost-effective and saves energy dollars.

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At the National Insulation Association, our member companies are trying to make a real-world difference. For example, one member, Fit Tight Covers, recently performed an energy appraisal that documented the difference mechanical insulation can make. The company helped a client greatly reduce CO₂ emissions as part of its 2025 carbon reduction goals. After upgrading the client’s mechanical insulation, analysis showed that appropriately insulating operations at one plant alone is saving approximately 2,000 metric tons of CO₂ per year, while also reducing the plant’s annual energy costs from \$102,000 to \$8,000.

Mechanical insulation: Saving energy and saving the planet. Who says you can’t have it all?

For more information about the National Insulation Association, visit www.insulation.org or email president@insulation.org.

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