



Blinded by a glimpse of the obvious

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THE VOICE OF THE INSULATION INDUSTRY™

Discovering that a simple solution has been the answer all along can feel like finding something in plain sight. Mechanical insulation is one of those obvious yet simplistic solutions. The same concept that drives millions of us to buy Yeti and Pelican coolers for our drinks also applies to manufacturing operations, especially those involving temperature-controlled processes like steam.

The cheapest energy is the energy you don't use in the first place — insulate. And when you decrease energy use, you reduce carbon emissions. A BTU of energy that is not used to elevate a piping system fluid to 350°F is a BTU saved from being produced or emitted, saving the company money.

Mechanical insulation reduces energy used and therefore prevents more CO₂ from entering the atmosphere.

Did you know that insulation starts working as soon as it is added to the system? Tomorrow, your company could reduce

energy loss from 1,462 BTU/hour to a mere 71 BTU/hour per lineal foot by adding two inches of fiberglass insulation to an uninsulated 4-inch diameter 350°F pipe. The CO₂ emissions would drop from 2,427 lbs per foot per year to 118 lbs. Insulating just 4 linear feet of previously uninsulated pipe can offset the annual emissions of the average home, which is 7.5 mt of CO₂ emissions.

Carbon capture technology

In October 2021, the DOE announced \$45 million for 12 projects to develop point-source CCS technologies capturing at least 95% of CO₂ emissions from natural gas power and industrial facilities. These are primarily R&D FEED projects that are a part of DOE's efforts to help the U.S. achieve the Biden administration's goals of net-zero carbon emissions by 2050 and a 100% clean electricity sector by 2035.

Now compare the proven savings of mechanical insulation versus newer CCS technologies. Mitigating CO₂ emissions technology falls into two buckets under the umbrella known as CCUS technology:

- Reducing carbon emissions at the source is

called point source carbon capture.

- Reducing existing carbon already present in the atmosphere, or direct air capture (DAC). Each has its advantages and challenges, and both are considered important tools in the fight against climate change.

Both technologies are designed to reduce CO₂ emissions but operate differently. Point source captures CO₂ at the flue gas source, while DAC uses chemical sorbents or materials that hold CO₂ to their surface. Under normal conditions, the typical chemical composition of air at sea level is approximately 78% nitrogen, 21% oxygen and less than 1% argon and CO₂ combined. Both technologies require the captured CO₂ to be transported — via trucks, pipelines or trains — to a location for permanent storage or for use in another process if the capture unit is not located at the emission site. Houston-based OXY is building the world's largest DAC project, a \$1 billion venture designed to remove 500k mt of CO₂ from the atmosphere annually.

The obvious, simple solution

Operational costs for CCUS technologies are estimated to range from \$100 to \$600 per

ton of CO₂ captured. This includes energy, maintenance, labor, sorbent and chemical materials, water, other utilities and transport and storage if the CO₂ is moved for storage or utilization.

There is no 100% solution to minimizing emissions. Rather, we need a lot of 10% and 20% solutions. Mechanical insulation reduces energy used and therefore prevents more CO₂ from entering the atmosphere. It can help companies reach their short-term carbon reduction targets. Mechanical insulation needs to be given the respect it deserves as a point-source carbon capture product — even though it's not classified as such.

Mechanical insulation has a technology readiness level of nine — the highest level — indicating it is a fully mature, operational system. While new technologies are being developed globally to remove or reduce CO₂ emissions, mechanical insulation already prevents CO₂ generation at its source. It's cost-effective, proven and saves energy costs — from the first day of installation and every day thereafter.

For more information, visit insulation.org.

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