



# CILANTRO

## Pioneering Net-Negative CO<sub>2</sub> Cement

Transforming a crucial global industry from a major CO<sub>2</sub> emitter into a climate-positive asset.

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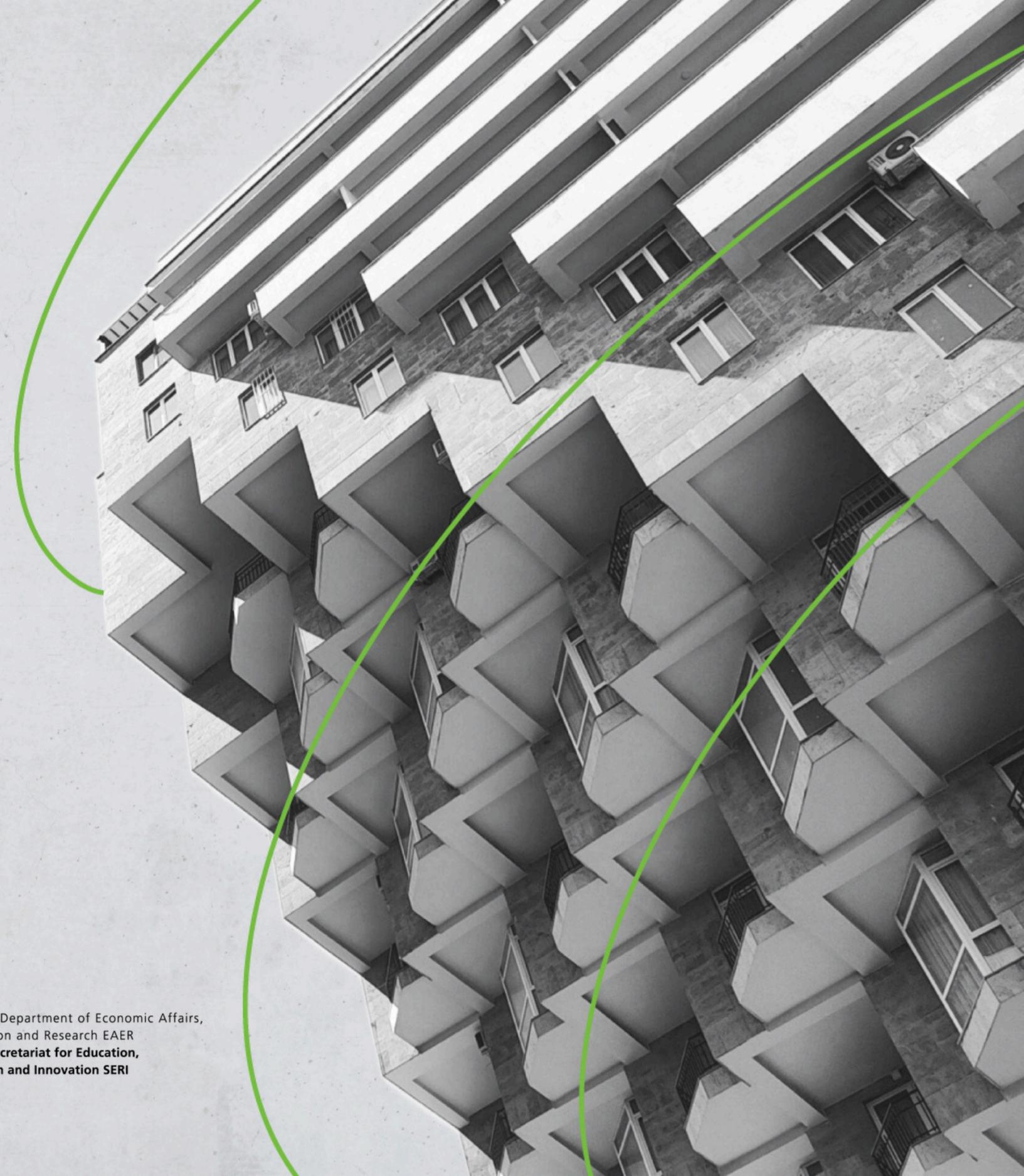
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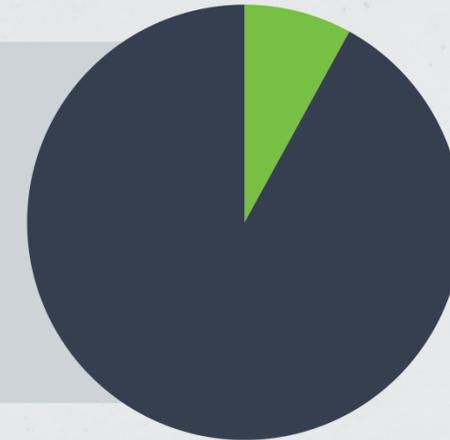
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# The Crisis: 8% of Global Emissions



## 8% of Global CO<sub>2</sub> Emissions

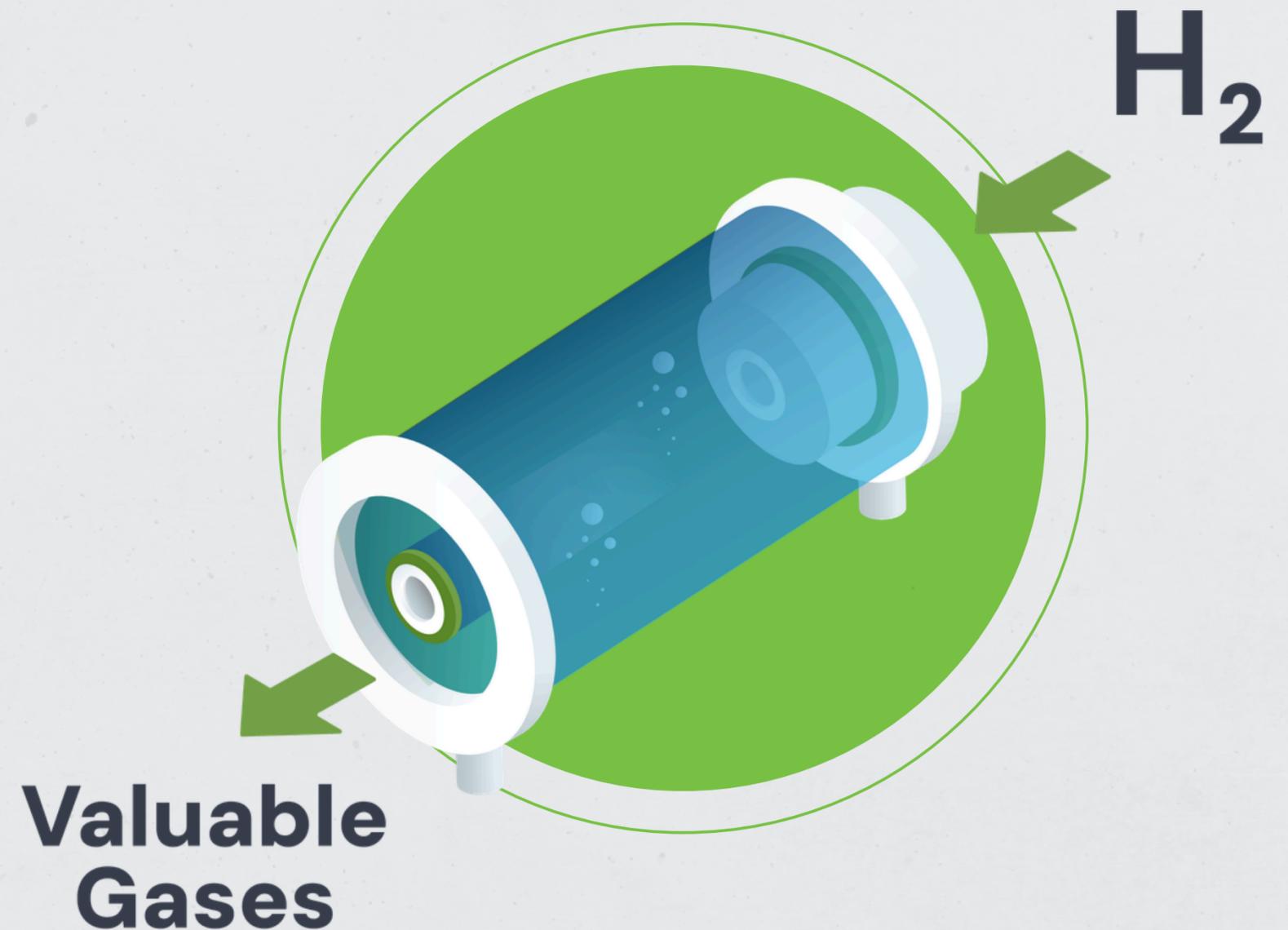


The cement industry is a cornerstone of infrastructure, yet it accounts for approximately 8% of global CO<sub>2</sub> emissions - more than air travel. Traditional production relies on high-temperature processes that chemically release CO<sub>2</sub>. Achieving climate targets requires a fundamental chemical revolution, not incremental fixes.

CILANTRO is disrupting this trillion-euro market with the only viable non-thermal technology designed to achieve net-negative CO<sub>2</sub> cement from day one. This is essential infrastructure for the Net Zero transition.

# The Breakthrough: Non-thermal CO<sub>2</sub> Prevention

We substitute the energy-intensive, high-heat thermal process (calcination) with mechanochemical activation of limestone under a controlled gas atmosphere. This eliminates the chemical generation of CO<sub>2</sub>.



# Beyond Decarbonisation: A Circular Solution



## Zero process emissions

We prevent CO<sub>2</sub> from being released.



## Hydrogen integration

The process relies on low-cost hydrogen feedstock.



## Circular value

We co-produce valuable gases (CO/Methane) used as clean synthetic fuels or chemical precursors.

# The Implementation Team



CILANTRO is executed by a consortium of eight partners across six European countries. We combine leading expertise in mechanochemistry, materials science, industrial engineering, and IP commercialisation.



# The Breakthrough: Non-thermal CO<sub>2</sub> Prevention



Clean air & Climate neutrality: We deliver a direct, quantifiable solution for the 8% CO<sub>2</sub> problem. Our technology is essential for Europe to meet its Net Zero construction targets.

Protected innovation: We are securing the core intellectual property (IP) around the mechanochemical process. This protects the innovation and provides a clear licensing pathway for industry-wide adoption.

**Research**

**Validated  
Technology**

**Industrial  
Demonstration  
Blueprint**

**The Path Forward:** Having successfully de-risked the foundational science (TRL 4), our immediate focus is validating the technology's scalability and preparing the blueprint for an industrial-level demonstrator. This ensures our results transition efficiently from the laboratory to the market.

# Scientific Approach: Mechanochemical Transformation



1.

## The Core Innovation: Bypassing Heat

### **Ambient Activation:**

Replacing 1450°C thermal calcination with high-energy mechanical milling.

**CO<sub>2</sub> Prevention:** Structural activation of limestone at ambient temperatures to eliminate process-related emissions

2.

## Hydrogen-Assisted Chemistry

**Reactive Feedstock:** Using H<sub>2</sub> to facilitate the direct transformation of carbonate into high-value Carbon Monoxide CO.

**Circular Value:** Co-producing clean synthetic fuels or chemical precursors.

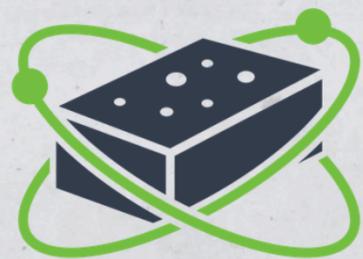
3.

## EIC Enabling Technologies

**Multiscale Modelling:** Using atomistic simulations to design and optimise tribochemical bond-breaking.

**Precision Testing:** Integrating imaging and data-driven science for real-time characterisation.

**Validation (TRL4): Rigorous laboratory testing to meet or exceed industry norms and standards.**



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# Thank you!

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