

CO₂ncrEAT

CCU going forward towards Carbon neutrality in 2050

Frederik Verhelst - Head of Materials - Europe Business Innovation Center - Lhoist October 11th, 2023









LIME AS A CARBON SINK







CRITICAL INDUSTRY FOR 22ND CENTURY SOCIETY

Combined CCS and CCU lead to carbon negative contribution for society





Our challenge: The unavoidable CO₂ ("process CO₂")



LHOIST CARBON ROADMAP TOWARDS 2030

Choist | 5



ALIGN ALL MANAGEMENT PROCESSES (Reporting, finance, human resources...)

Choist | 6

In some applications, especially in materials, this cycle becomes **carbon negative**.



LHOIST CARBON ROADMAP TOWARDS 2050





CLhoist Belgium: • Wind PPA Preheater - Hermalle & Dumont Wautier Netherlands: Fuelshift to recycled fuels Fuelshift to biomass • Fuelshift to biomass Hydrogen: trial CO, value Europe A global Energy efficiency: Automatisation - Jemelle UK: Carbon capture: Leilac 1 CHP - Hindlow Carbon capture: Oxyfuel perspective Preheater - Whitwell Carbon/hydrogen transport: Walloon backbone Energy efficiency: Automatisation - Hindlow Photovoltaic Denmark: Kilnshift Energy efficiency: • Carbon use: Mineralisation of slag Energy efficiency: Gas analyser - Whitwell Gas analyser - Faxe Carbon use: e-Kerosene Fuelshift to recycled fuels Hydrogen: study Poland: • Carbon/hydrogen transport: Hynet-Peak district Energy efficiency: • Fuelshift to biomass Automatisation - Bukowa Fuelshift to biomass Wind PPA Czech Republic: 💉 Kilnshift Kilnshift - Beroun 35 Out + ---Portugal: Fuelshift to biomass USA: Photovoltaic Kilnshift - Marble Falls Kilnshift - New Braunsfels Spain: Fuelshift to natural gas Fuelshift to biomass Malaysia: Kilnshift - Alabaster/Montevallo Photovoltaic Photovoltaic Energy efficiency: Automatisation Fuelshift to biomass - Nelson & Marble Falls State of the art Photovoltaic new plant Brazil Fuelshift to biomass Energy efficiency: Germany: Automatisation - Limera Preheater - Hönnetal Photovoltaic Fuelshift to recycled fuels Level Blue CHP - Rheine Automatisation - Flandersbach France: Fuelshift to biomass Photovoltaic • Carbon capture: Leilac 2 Kilnshift - Neau Carbon capture: LISA Fuelshift to biomass Carbon capture: Carina implemented or ongoing Fuelshift to recycled fuels Carbon capture: Scarlet planned or study Fuelshift to natural gas Carbon use: Carbon2Chem Wind PPA Energy efficiency: Automatisation - La Mède & Poliénas Carbon storage: DINAMX

ROADMAP TRANSFORMATION PATHWAY TO A LOW CARBON LIME OFFER



TOWARDS LOW CARBON LIME

In some applications, especially in materials, this cycle becomes **carbon negative**.







CO₂ncrEAT CARBON NEGATIVE BUILDING PRODUCT





CO₂ncrEAT INDUSTRIAL PROCESS

CO₂ncrEAT project consists in the production of eco-friendly carbonated construction blocks through an innovative process conducted by a consortium made of four (4) companies: Prefer, Orbix, Lhoist and Fluxys

SLhoist

11



CO₂ncrEAT DOUBLE CIRCULARITY : LIME AND CO₂



This document and its contents are confidential and cannot be disclosed to any third party without the prior consent of Lhoist

Lhoist | 12

CO₂ncrEAT GEOGRAPHIC FOOTPRINT



Lhoist | 13

CO₂ncrEAT SITUATIONAL DESCRIPTION





Orbix



- Yellow: Fluxys pipeline
- **Orange:** Orbix Carbinox supply route
- Blue: Prefer plant

CO₂ncrEAT BLOCKS vs. CONCRETE BLOCKS AN EXISTING MARKET, CARBONATION AS SUSTAINABLE BINDER

- > New production unit
- Industrial development of a building material with positive climate impact compared to existing offer
- > 1 on 1 replacement





Lnoist

15

CO₂ncrEAT METRICS OF THIS CARBON CAPTURE & UTILISATION PROJECT





Circular economy

- \circ Combination of two by-products (CO₂ + slags)
- Slags source of Calcium and recycled sand
- Better use of **natural resources**



Up to 100 kg CO₂-sequestration / ton blocks totalling 200 kt avoided, cumulated after 10 years



Industrial CO₂ use leading to **Efficient** CO₂-sequestration and low **cost** \in /ton CO₂

LNOIST



Low energy consumption



Contribution to Net carbon negative over the full value chain







CO₂ncrEAT RECENT DEVELOPMENTS

SLhoist **FIRST BUILDING BLOCKS MADE FROM INDUSTRIAL STREAMS:** SAME BUILDING BLOCKS, **REDUCED CARBON FOOTPRINT**



European Union through the Innovation Fund Small Scale, grant agreement 101103194.



the European Union

The CO₂ncrEAT team is working day and night to make it happen...



18



prefer®

SLhoist

fluxys

CO₂ncrEAT

orbix

An integrated negative carbon footprint solution for building blocks. Same building blocks, different carbon footprint.



Funded by the European Union

14



Together, The Future

