

Routekaart Koolstofverwijdering



Ministerie van Klimaat en
Groene Groei

Innovation programme on carbon removals

Breakout session 1

April 23, 2026

Yvette van Beek, Yvette.vanbeek@rvo.nl

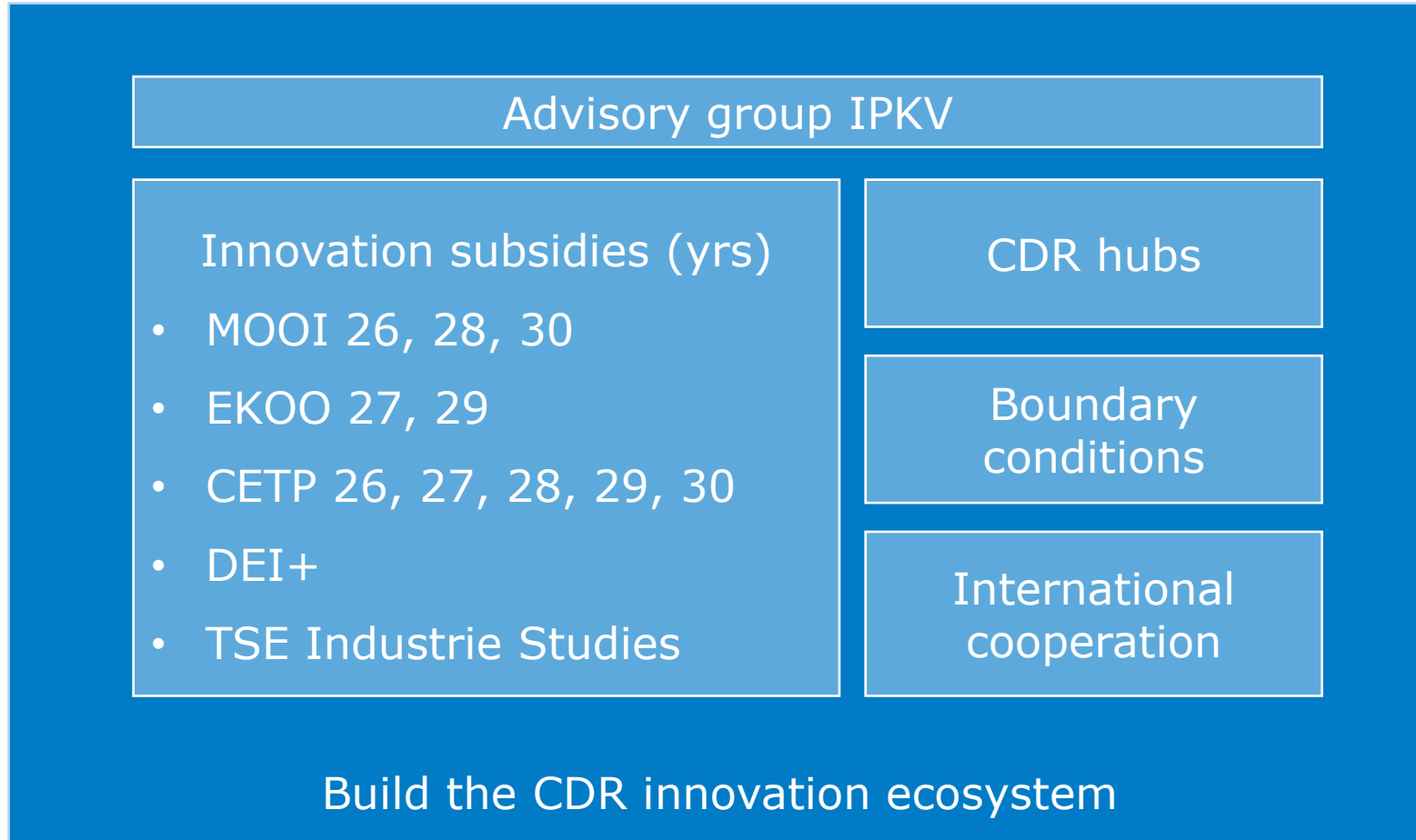


Programme

| Time | Topic | Speaker |
|----------------------|--|--|
| 13.00 – 13.10 | Welcome and update | Yvette van Beek |
| 13.10 – 13.20 | Introduction on two sessions | Earl Goetheer |
| 13.20 – 13.40 | Current CDR projects funded by RVO | Paebbl & Carbyon |
| 13.40 – 14.20 | Panel discussion on projects and financing | Led by Yvette van Beek Pol Knops (Paebbl) Hans de Neve (Carbyon) Greg de Temmerman (Techleap) |
| <i>14.20 – 14.40</i> | <i>Coffee break</i> | |
| 14.40 – 15.30 | Knowledge session on boundary conditions | Led by Earl Goetheer Samantha Tanzer (TU Delft) Peter de Jong (Natuur & Milieu) |
| <i>15.30</i> | <i>Back to plenary session</i> | |

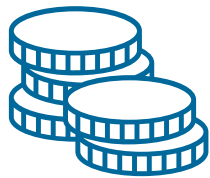


Innovation Programme on Carbon Removals





Innovation Programme for Carbon Removals



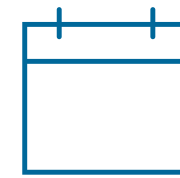
Subsidy calls

MOOI KV 2026
EKOO KV 2027
CETP 26-27
DEI+ & STUDI



CDR hub

Interviews
Preparation financial scheme
[Open for input after session](#)



Follow-up event

Q3-Q4 2026



Projects and financing

Yvette van Beek



carbyon

**Reversing climate
change by
capturing the sky.**



Concentration of CO₂ in the atmosphere is the highest in 2 million years: it has risen from 280 ppm in 1750 to 420 ppm in 2022. **And keeps rising.**



**Global CO₂
emissions need
to be net zero
by 2050.**



**But even if we make it, our
planet is warming up and
keeps warming up.**

We need
deep emission
cuts across all
industries



and a portfolio of
carbon capture
solutions.

BUT...

**Current Direct
Air Capture solutions
are
too big, too
expensive,
hard to scale
or simply not durable.**

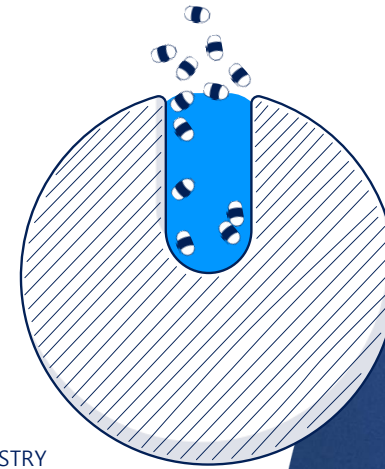


The fast-swing technology results in very fast sorbent saturation: in 100 seconds the material reaches 90% saturation.

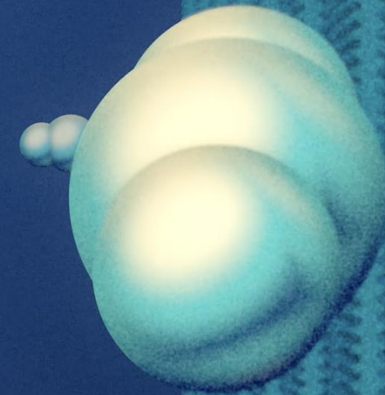
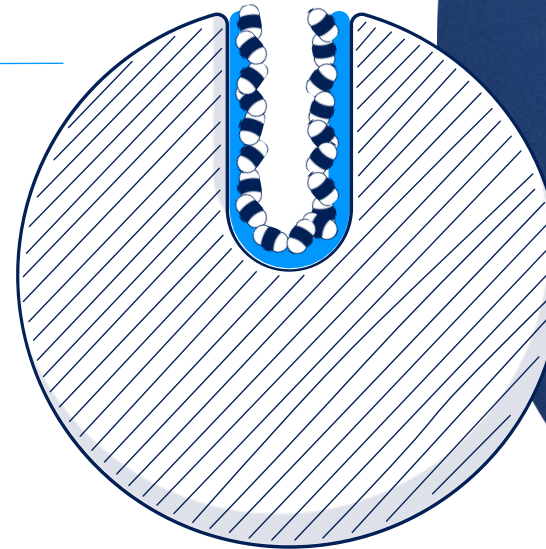
Fast-swing technology:

- An atom-scale thin film technology.
- Carbyon succeeded in applying this thin film technology to a porous carrier offering 2,000 m² surface area per gram of carrier material.
- The result is a fast-swing technology: in 100 seconds the material reaches 90% saturation
- Every kg of sorbent material produces 5 ton of CO₂ per year

INDUSTRY STANDARD



CARBYON TECHNOLOGY



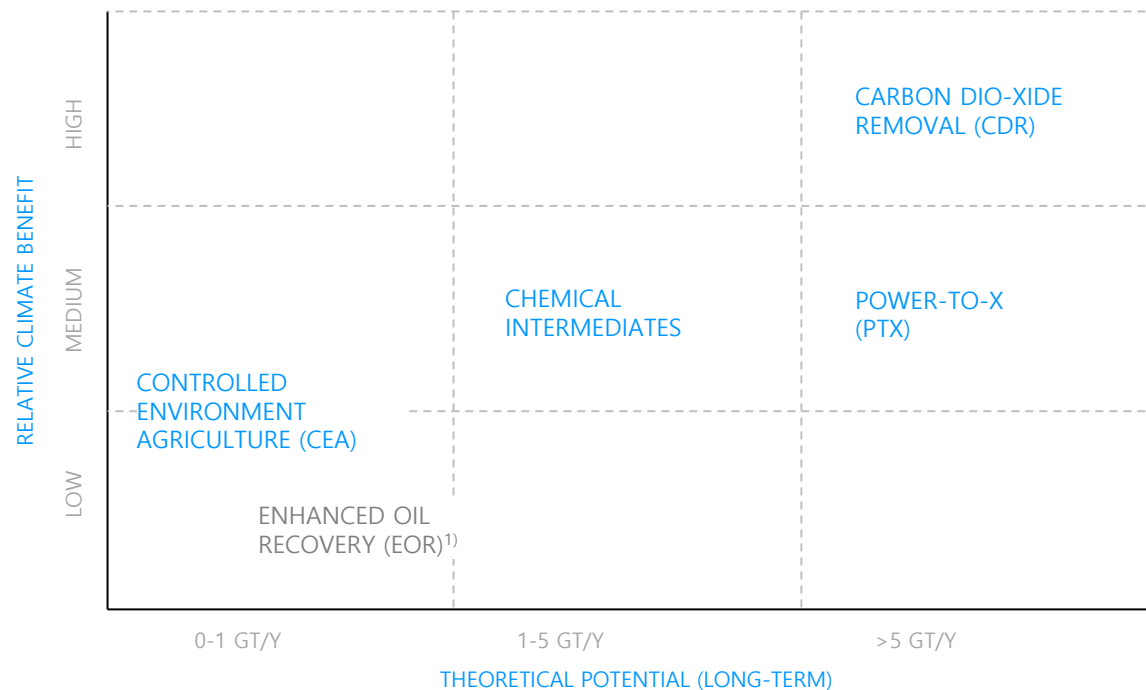


CARBYON GO WORLD'S FASTEST DAC MACHINE

**Carbyon is the only
Direct Air Capture
company
using a unique fast-
swing thin film
technology.**

Theoretical potential of DAC application areas vary from 0-1 Gt to >5 GtCO₂/ year – PtX and CDR have the highest long-term potential.

Annual potential and climate benefit of selected DAC application areas



Carbon Dioxide Removal (CDR)

Negative emissions by permanent storage of captured CO₂.

Power-to-X (PtX)

Renewable CO₂-neutral fuels and chemicals (PtX).

Chemical Intermediates

CO₂ supply via merchant gas suppliers for non-target markets.

Controlled Environment Agriculture (CEA)

CO₂-dosing for increased crop yield (CEA).

Enhanced Oil Recovery (EOR)

Technique used to recover oil with CO₂ gas – Carbyon will not pursue this market due to our Ethical Charter

Research partners



General scientific and business support as part of the technology transfer program. Carbyon is a spin-off from TNO.



Modification of powderous meso-porous materials.



Life cycle analysis of Carbyon's DAC solution.



Research on recipes for monolayer depositions on porous materials.



Energy-efficient desorption and regeneration of CO₂.



Sorbent and process development for DAC.



Sorbent and process development for DAC.



Modification and characterization of ultra- and meso-porous materials.



Sustainable materials research and modelling.



Inherently functionalized material research.

Development partners (EU)



Prototype development



High tech equipment manufacturing



System architecture expertise and top-notch advice on deep tech topics



Systems engineering expertise and rapid prototyping

Future-proof Material Made of CO₂



Pol Knops

Physics, 1963

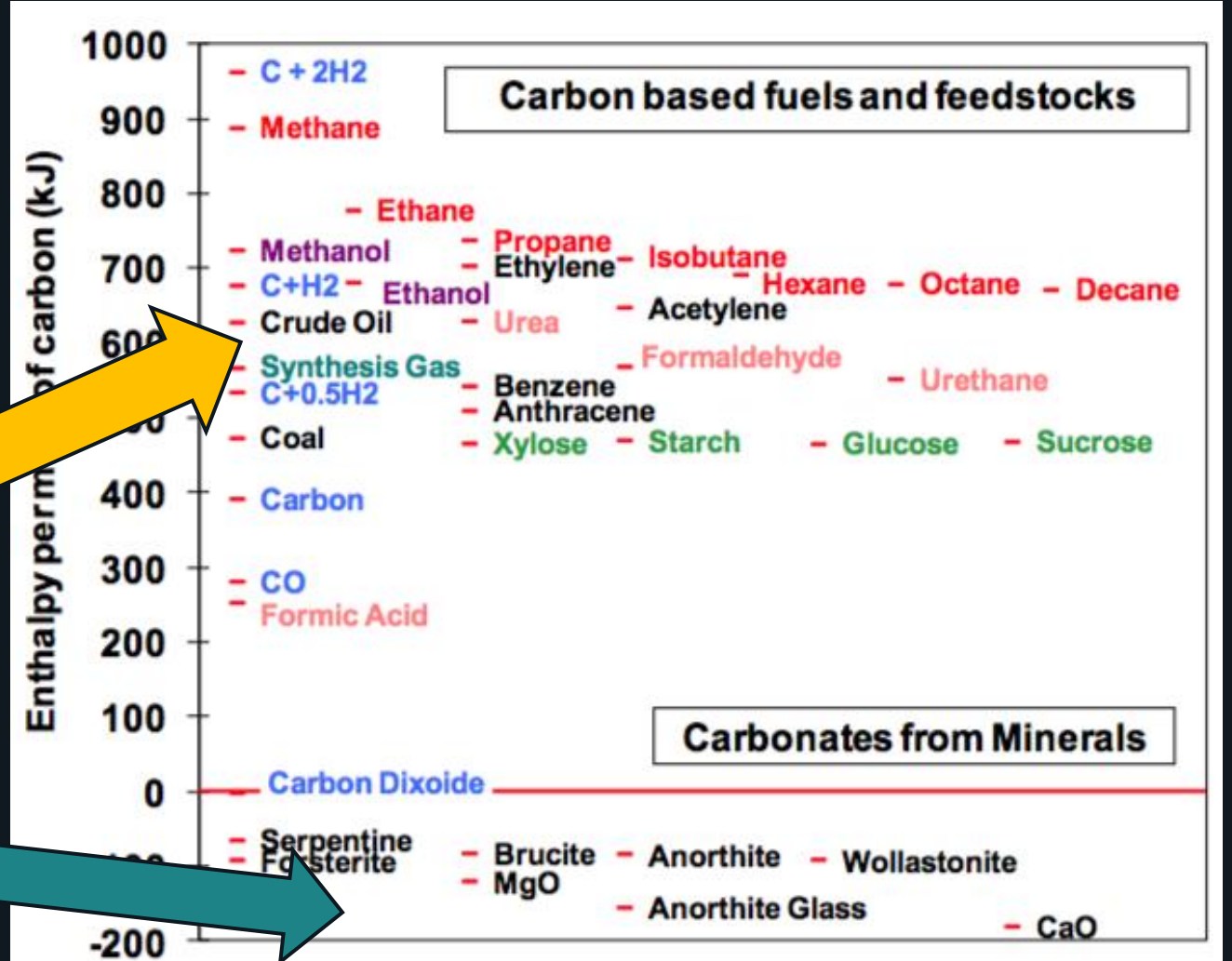
317 ppm

Mineralisation since 2010

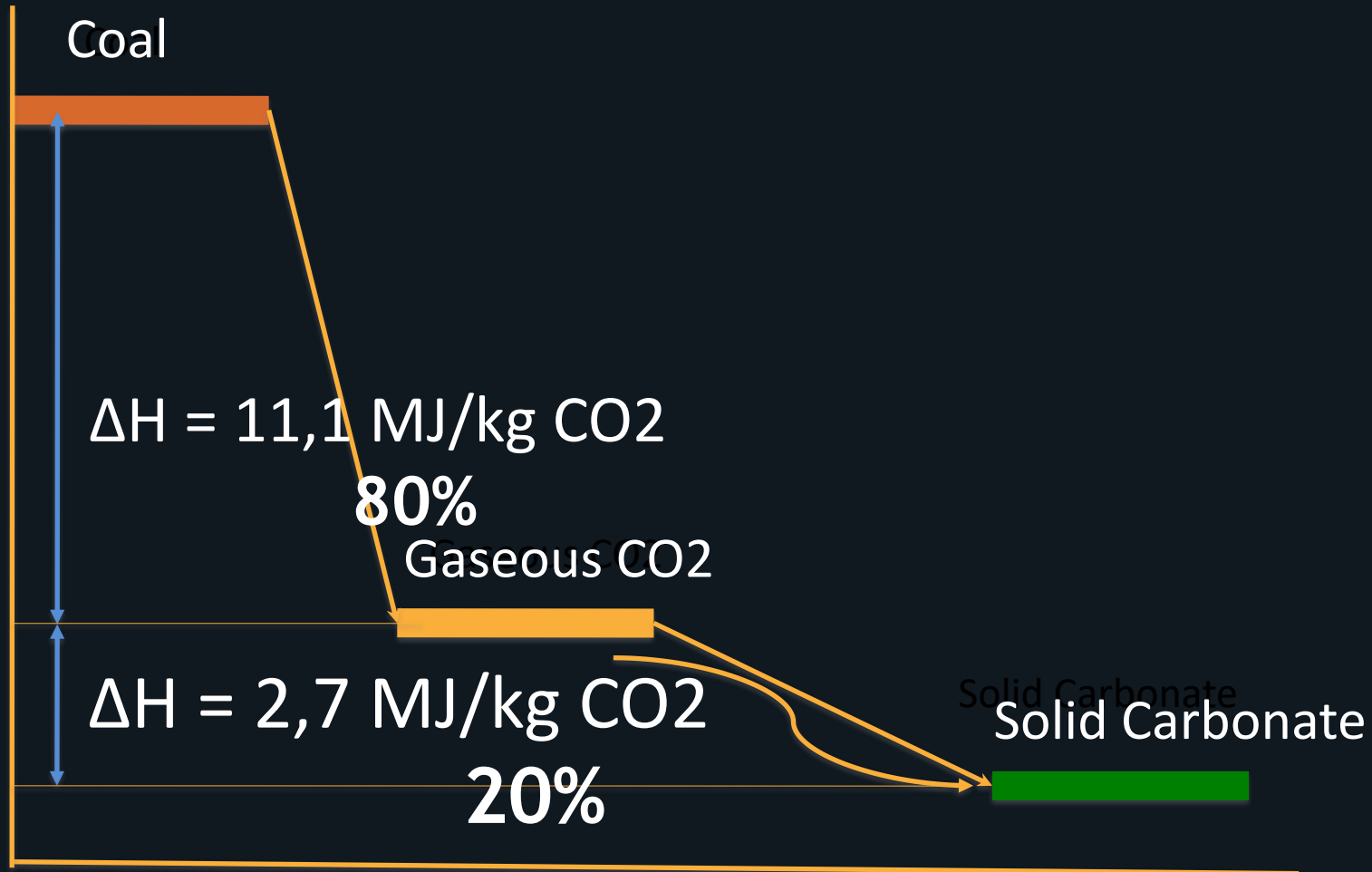
CATO:

- contact since 3rd June 2011
- First presentation 22 May 2012
- Project 2017
- Co-founder Paebbl 2021

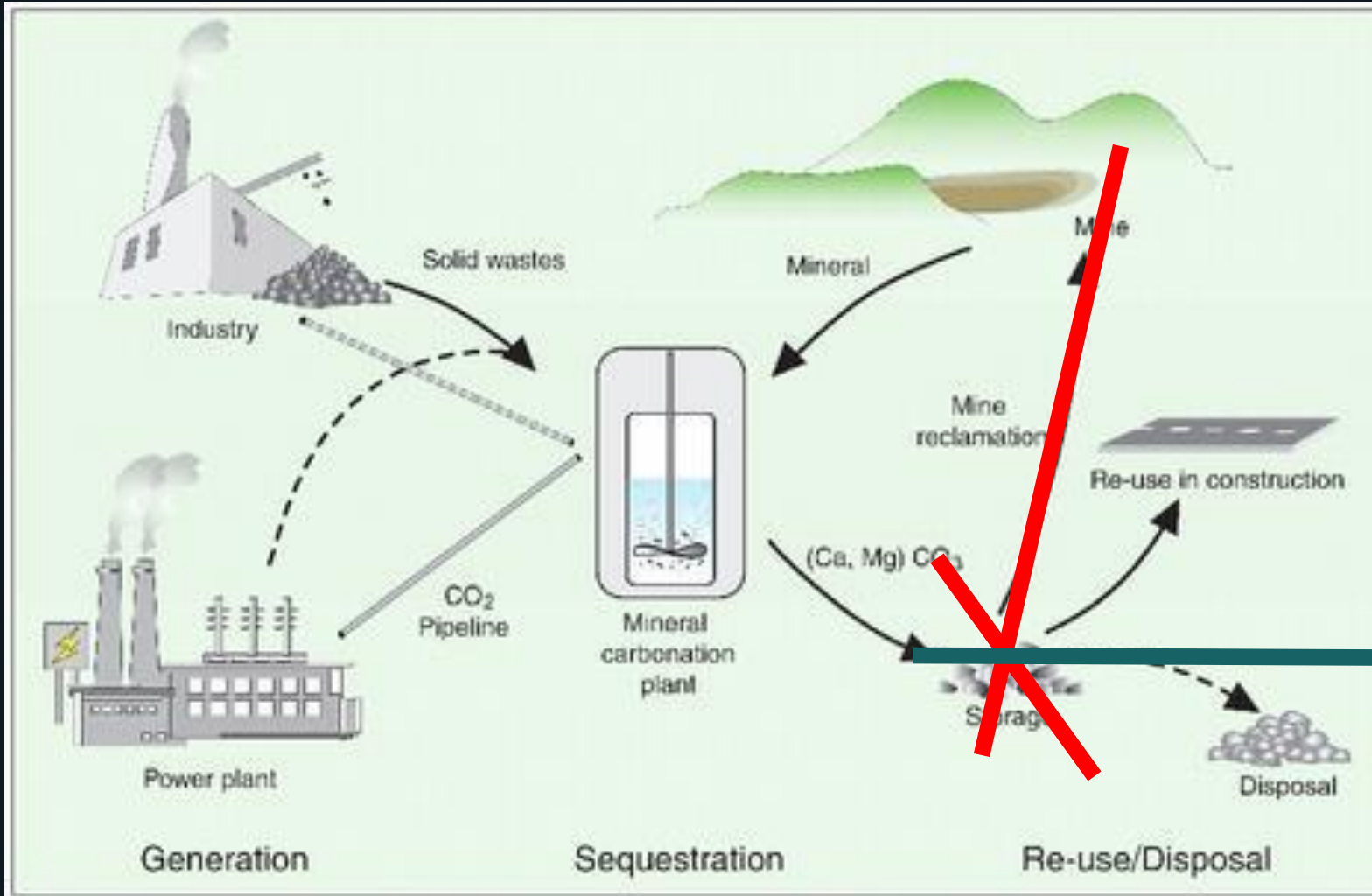
CO₂ uses



Mineralisation

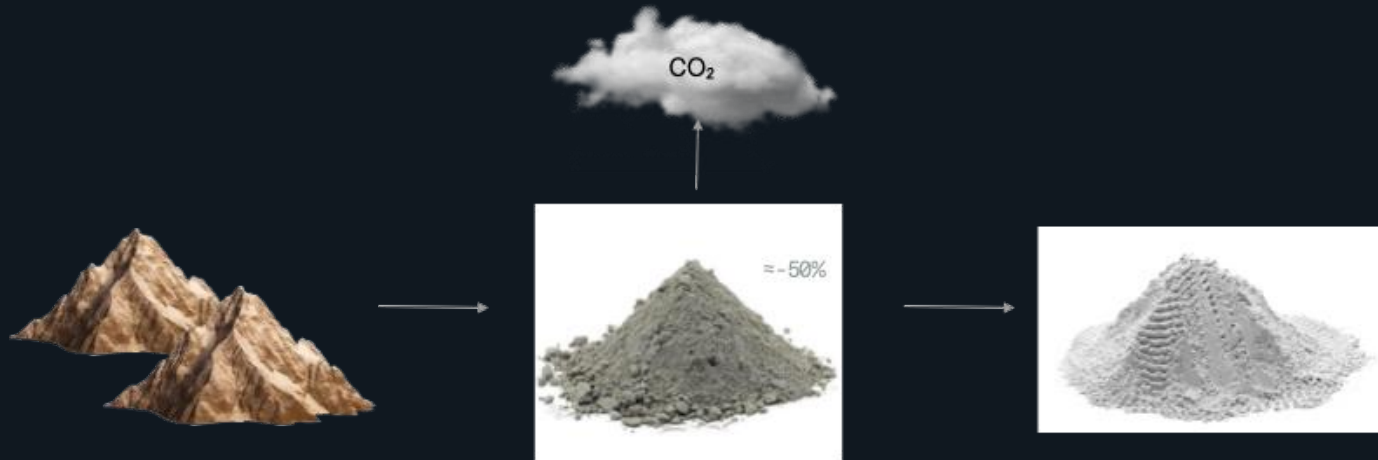


~~Historical~~ view Mineralisation



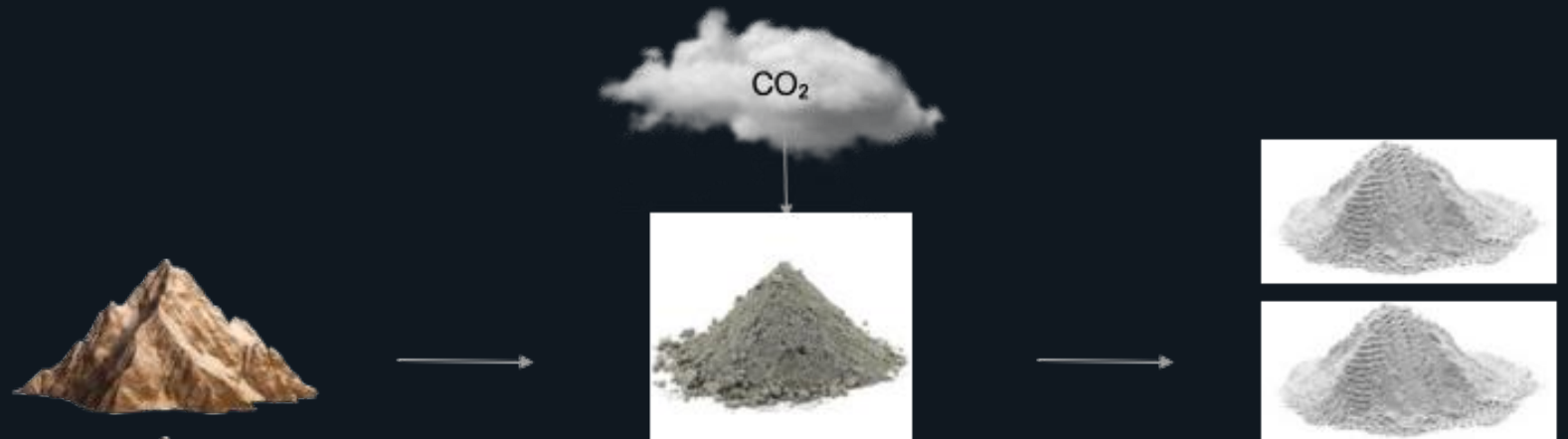
Products
Products
Products

From emitting to storing: redefining concrete



Traditional cement emits 800kg CO_2 per tonne.

Instead, Paebbl bounds 200kg per tonne.



Journey

2021

Founded

€31M

Raised to date

8

Patents filed

2,500x

Cumulative tech scale-up since launch (see next page)

9

Commercial projects delivered

20+

Ton of on-spec product produced for customers

~15

Tons of CO₂ sequestered

1,000h+

Cumulative active Demo plant running-time

We scaled up 2500x in under two years

Bench Scales
Q2 2022 - Q2 2023



<100x
6 months

Pilot Scale
Q2 2023 - Q4 2023



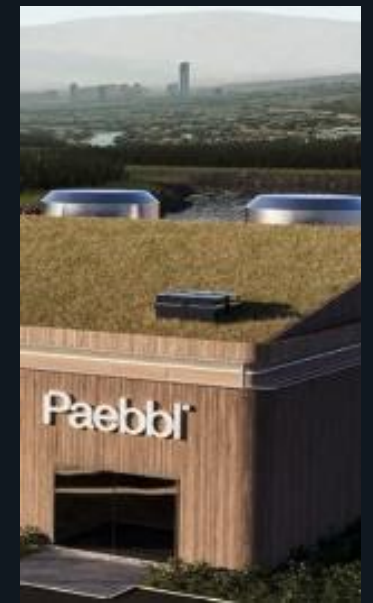
<25x
18 months

Continuous Demo Plant
Q1 2024 -> Q2 2025



<25x
30 months

Continuous FOAK
1H2028



10-20 kt CO₂/year **
Product: 30-100ktpa/year**

Planned

Project



The world's first carbon-neutral concrete bridge
Netherlands, January 2026

Take home message

- CO2 as a feedstock
- Permanent storage
- Value generation products
- Linking other industries to CO2 sources
- Rotterdam out R&D hub



Paebbi®





Projects and financing



Pol Knops

Co-founder/Initiator
(Paebbl)



Hans de Neve

Founder & Principal Scientist
(Carbyon)



Greg de Temmerman

Director Deeptech and Spin-off
Excellence
(Techleap)



Knowledge session on boundary conditions

Earl Goetheer



Knowledge session on boundary conditions



Dr. Samantha Tanzer

Technology, Policy and Management – CDR
(TU Delft)



Peter de Jong

Programme Manager Energy
(Natuur & Milieu)



Thank you for your attention!

 <https://www.rvo.nl/onderwerpen/co2-opslaan-hergebruiken-verwijderen/innovatieprogramma-koolstofverwijdering>

 yvette.vanbeek@rvo.nl